

COMMUNITY COLLEGE RE-ENROLLMENT AFTER HURRICANE KATRINA

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ABSTRACT

In this study, we explored predictors of community college re-enrollment after Hurricane Katrina among a sample of low-income women ($N = 221$). It was predicted that participants' pre-hurricane educational optimism would predict community college re-enrollment a year after the hurricane. The influence of various demographic and additional resources (e.g., social support, childcare, hours of employment, psychological well-being) was also explored. High levels of pre- and post-hurricane educational optimism were significant predictors of re-enrollment, as were lower post-hurricane psychological distress and fewer post-hurricane hours employed. In addition, experiencing a greater number of moves since the hurricane was a marginally significant predictor of post-hurricane re-enrollment.

Although graduation from community college can confer significant social and economic advantages (e.g., Baum & Payea, 2005; Coley, 2001), a distressingly large proportion of community college students fail to complete their studies despite their intentions to do so (Driscoll, 2007; McClenney, 2004). Many community college students must balance school with holding jobs and caring for children (e.g., Bean & Metzner, 1985; Chartrand, 1992). These potential stressors on persistence might be exacerbated if students face a traumatic event. In this

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study, we investigate community college persistence in a sample of low-income women ($N = 221$) who survived Hurricane Katrina. Drawing from a longitudinal dataset, we assess the impact of hurricane exposure, as well as pre- and post-hurricane resources (e.g., educational optimism, social support, hours of employment), on participants' likelihood of re-enrollment approximately 1 year after the storm.

BACKGROUND

Obtaining an Associate or Bachelor's degree is associated with significant economic benefits, particularly for groups traditionally underrepresented in higher education. On average, an Associates degree has been estimated to increase full-time salaries by over 20% and a Bachelor's degree by over 60% (Baum & Payea, 2005). This economic advantage appears to be even greater for women than men (Baum & Payea, 2005; Grubb, 2002; Marcotte, Bailey, Borkoski, & Kienzl, 2005; Perna, 2005), and for African Americans than Whites (Baum & Payea, 2005; Grubb, 2002). For example, compared to women whose highest level of education is a high school diploma, women who obtain an Associates degree earn 47.6% more annually, whereas, for men, this educational benefit is only 14.7% (Marcotte et al., 2005). For single mothers, higher education can help pull families above the poverty line (Baum, & Payea, 2005), and level of education has a stronger impact on earnings than work history, suggesting the particular importance of postsecondary education to economic outcomes (Zhan, & Pandey, 2004). In addition, earning a Bachelor's degree has been found to be crucial for African-American women to attain comparable salaries as less educated African-American men (Cohen & Nee, 2000).

Given the importance of higher education in promoting positive economic outcomes, particularly for historically disadvantaged groups, it is important to consider factors that might influence re-enrollment after disruptions in attendance. Previous research and theory suggest a host of factors associated with persistence in community college. Prominent among them is optimism, both in general and specifically related to educational goals. In this study, we define *educational optimism* as having high expectations about one's likelihood of achieving a given academic goal, in this case graduating from a 4-year community college. Educational optimism is likely related to other psychological qualities, including general optimism, outcome expectations, and future orientation. We therefore turn to research on these concepts to provide insight into the role of educational optimism in predicting re-enrollment.

General indices of optimism, which measure the general tendency to anticipate positive outcomes, are associated with a variety of positive educational outcomes, including better academic adjustment (Aspinwall & Taylor, 1992), lower rates of depression (Mosher, Prelow, Chen, & Yackel, 2006), and lower job burnout

among working students (Chang, Rand, & Strunk, 2000). More recent research has found optimism regarding educational goals to be associated with long-term educational attainment (Mello, 2008).

Lent, Brown, and Hackett (1994) have embedded the construct of optimism specific to future educational outcomes, or what they refer to as *outcome expectations*, into their Social Cognitive Career Theory (SCCT), which predicts attainment of both educational and career goals. According to SCCT, students' abilities and self-efficacy contribute to outcome expectations, and outcome expectations in part account for achievement of concrete goals and overall attainment. Supporting this link, Hawley and Harris (2005) found that first-year community college students who expected to be at the university for a longer amount of time were more likely to remain enrolled 9 months later.

Educational optimism might also represent the ability to sustain high outcome expectations about longer-term goals, as opposed to focusing exclusively on immediate stressors. The ability to maintain a focus on future goals, also known as *future orientation*, is likely particularly valuable for community college students facing a major stressor. Research on future orientation suggests that the ability to focus on goals is associated with a range of positive academic outcomes. Future orientation is associated with academic motivation, conceptual learning, persistence, and grades, effects that are partially accounted for by greater perceptions of instrumentality of academic tasks among students with high orientation toward the future (Malka & Covington, 2005; Simons, Vansteenkiste, Lens, & Lacante, 2004). Perceiving academic tasks as instrumental to future goals, in turn, increases both the intrinsic and extrinsic value given them (Miller, DeBaker, & Greene, 1999). Orientation toward the future also increases college students' academic engagement, the meaning given to academic tasks, and hours spent studying (Horstmanshof & Zimitat, 2007).

Taken together, the above findings suggest that educational optimism might be an important resource in predicting re-enrollment in higher education after a major stressor. Of course, optimism about educational goals is not the only resource that facilitates persistence in community college. In formulating the SCCT, for example, Lent and colleagues (1994) stressed the importance of contextual determinants in shaping their model, stating that beneficial environmental conditions promote outcome expectations, thereby bolstering goal achievement, whereas less favorable conditions could lower outcome expectations and lead to forgoing efforts toward ambitious goals. Among the contextual factors proposed by the authors are available support systems and financial resources. Previous research on community college students has provided evidence that social support is an important resource in promoting positive academic outcomes (e.g., Bean & Metzger, 1985; Thomas, 2001). Social support has been linked to greater commitment to academic goals and an increased likelihood of re-enrollment after dropout (Buell, 1999), as well as lower psychological

distress and greater intentions to persist (Chartrand, 1992). General social support, however, might not facilitate positive academic outcomes. For example, Mutter (1992) found that only support related specifically to academic goals predicted community college persistence.

In addition, economic factors likely play an important role in decisions about higher education. Although stable employment can alleviate concerns about funding one's education, it can also interfere with educational activities (Miller, Pope, & Steinmann, 2005). To this end, research has found mixed results on the influence of hours employed on persistence. For example, Chartrand (1992) found that financial difficulties increased psychological distress of community college students, whereas hours of employment decreased such distress. Psychological distress, in turn, was a negative predictor of intent to persist in school. On the other hand, Snell and colleagues (Snell, Mekies, Green & Tesar, 1993) found that community college students were more likely to persist if they worked 10 hours or less per week, and Schmid and Abell (2003) found that full-time employment was associated with lower persistence.

On a practical level, employment could enable students to afford childcare for their children, increasing their academic persistence. Indeed, research and theory have identified family responsibilities as a barrier to college retention (Bean & Metzner, 1985; Chartrand, 1992; Sy & Romero, 2008). Of course, such responsibilities vary by children's ages and the number of children in the household. Research has also identified students' age as an important demographic consideration in predicting retention, with younger students generally more likely to remain in school than their older counterparts (Berkovitz & O'Quin, 2006-2007; Coley, 2001; Schmid & Abell, 2003).

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Another important consideration is whether students have been enrolled in educational interventions aimed to increase persistence. This is particularly the case in the current study, as participants were initially part of the Opening Doors study, a randomized controlled trial of an intervention with such a goal. Previous research has provided support that similar educational interventions, including orientation programs, specialized coursework, and extra advising, significantly increase community college retention (e.g., Berkovitz & O'Quin, 2006-2007; Derby & Watson, 2006; Driskoll, 2007; Pascarella, Terenzini, & Wolfe, 1986; Tinto, 1997). The Opening Doors program might also have alleviated financial concerns, as it provided students with a \$1,000 stipend per semester.

Lastly, in contrast to the resources that seem to enhance commitment to educational goals, psychological distress has been found to be a barrier to both community college persistence (Chartrand, 1992) and educational attainment in general (e.g., Fergusson & Woodward, 2002; Kessler, Foster, Saunders, & Stang 1995; Wittchen, Nelson, & Larcher, 1998). Psychological distress could certainly interfere with educational activities directly, or lead to decreases in other resources, including educational optimism and perceptions of social support.

Educational Outcomes after Natural Disasters

Although previous research has shed light onto the factors that both impede and promote community college persistence, we know little about what accounts for community college re-enrollment in the aftermath of major stressors, including natural disasters. This is unfortunate, particularly given the growing number of both human and natural disasters that can affect students. Indeed, each year, excluding droughts and war, nearly 500 incidents across the globe meet the Red Cross's definition of a disaster (Norris, Baker, Murphy, & Kaniasty, 2005). A substantial literature has examined the psychological effects of disasters on the individuals who are exposed to them (e.g., Rubonis & Bickman, 1991; Sundin & Horowitz, 2003). However, only one study to our knowledge has focused on the educational functioning of young adult survivors. Among a sample of Indonesian college students who survived the 2004 tsunami, Tahlil and Jones (2008) found a decrease in grade point averages (GPAs), although this decline was not statistically significant. Children's educational outcomes have also been investigated (e.g., La Greca, Wasserstein, & Silverman, 1998; Shannon, Lonigan, & Taylor, 1994), and greater post-disaster psychological distress has been found to predict lower academic achievement.

In both the adult study and the studies of child survivors of natural disasters, all participants remained in school after the disaster. It thus remains unknown how natural disasters might affect students' re-enrollment decisions. Adult survivors have the choice of whether or not to re-enroll, and a host of emotional and practical issues, including finding adequate housing, obtaining insurance reimbursement and FEMA monies, repairing damages, and caring for children, can derail educational plans. Yet returning to college, even in the midst of these stressors, can ensure long-term economic stability.

In light of the dearth of research on educational outcomes after natural disasters, however, it is useful to look at predictors of psychological distress in their aftermath, particularly given the aforementioned relationship between psychological distress and educational attainment. Such findings provide insight into what variables might account for adults' post-disaster decisions about education. A consistent finding in this research is that lack of psychosocial resources, and loss of such resources due to disasters and their aftermath, puts survivors at risk of distress. For example, lower socioeconomic status predicts higher levels of post-disaster psychological symptoms (e.g., Brewin, Andrews, & Valentine, 2000; Gibbs, 1989; Ginexi, Weihs, Simmens, & Hoyt, 2000), as does high levels of pre-disaster psychological distress (e.g., Ginexi et al., 2000; Weems, Pina, Costa, Watts, Taylor, & Cannon, 2007). Research has also found that lower post-disaster levels, or pre- to post-disaster losses, in social support and optimism to be associated with greater post-disaster distress (e.g., Kaniasty & Norris, 1993; Pickens, Field, Prodromidis, & Pelaez-Noguera, 1995; Smith & Freedy, 2000), indicating these variables as important risk factors.

In addition to resource variables, research on natural disasters has consistently demonstrated a dose-response effect, such that greater exposure is associated with higher levels of post-disaster psychopathology (Goenjian, Molina, Steinberg, Fairbanks, Alvarez, Goenjian, et al., 2001; Pickens et al., 1995; Shore, Tatum, & Vollmer, 1986). An additional factor in the post-disaster environment is displacement, which has been found to be associated with depression and post-traumatic stress (Najarian, Goenjian, Pelcovitz, Mandel, & Najarian, 2001), as well as with low socioeconomic status (Brodie, Weltzien, Altman, Blendon, & Benson, 2006). Survivors experiencing a series of moves in the aftermath of disasters have also been found to report greater levels of post-traumatic stress (Goto, Wilson, Kahana, & Slane, 2006). Residential instability could also prevent community college re-enrollment more directly. For example, survivors would need to be in one location long enough to identify institutions that fit their preferences and that would transfer credits from their former college. Survivors might also need to feel relatively certain that they would remain in a given location for a full semester before deciding to re-enroll.

THE CURRENT STUDY

The purpose of the current study was to explore predictors of community college re-enrollment in the aftermath of Hurricane Katrina. All of the participants were enrolled in community college at the time of the hurricane and lived in neighborhoods that were directly affected by the storm. The research was designed to address the following questions: Do pre- and post-hurricane psychosocial resources (educational optimism, social support, involvement in an educational intervention, employment, regular childcare, lower psychological distress) predict community college re-enrollment approximately a year after the hurricane? How does exposure to the storm (hurricane-related stressors, moves since the storm) affect the likelihood of re-enrollment? Based on the literature reviewed above, we predicted that participants' pre- and post-disaster educational optimism would be associated with post-disaster community college re-enrollment. Given the lack of research on community college re-enrollment after natural disasters, however, our analyses are best conceptualized as exploratory.

METHODS

Participants

The 221 participants in this study were a subset of a larger sample of community college students who enrolled in a research demonstration project. The subset consisted of women who were living in areas affected by Hurricane Katrina, were enrolled in community college at the time of the hurricane, and for whom we had complete data on study variables. The mean age for the sample was 25.6 years

($SD = 4.35$). Of those reporting their race and ethnicity, 78.7% identified as Black non-Hispanic, 12.2% as White non-Hispanic, 3.2% as Hispanic, and 2.3% as another race. At Baseline, 86.0% reported that they were living without a spouse or partner. All of the participants were parents, with 39.8% having one child, 32.1% having two children, and 28.1% having three or more children prior to Hurricane Katrina. The mean pre-hurricane monthly household income for those who reported it was just \$1,520.82 ($SD = \$1,042.30$).

All of the participants reported living in an area affected by Hurricane Katrina, which hit the New Orleans area on August 29, 2005, and more than half (51.0%) reported living in an area hit by Hurricane Rita in late September 2005. Relevant to the current study, while all of the participants reported having been enrolled in college prior to the Hurricane Katrina, only 44.8% attended thereafter.

Procedures

This study includes data from three waves of data collection, which are hereafter referred to as Baseline, Time 1, and Time 2. Participants were initially part of the multi-site *Opening Doors to Earning Credentials* study (Brock & Richburg-Hayes, 2006), a demonstration program designed to determine whether financial incentives and academic counseling services increased the retention rates and labor market outcomes of low-income students. Students eligible for participation were between 18 and 34 years old, had at least one child younger than 19 years old, and had a family income below 200% of the federal poverty level. They also had to have at least a high school diploma or GED but no other degree or occupational certificate from an accredited college or university.

At Baseline, 1,019 participants were recruited from three community colleges in the New Orleans area: Louisiana Technical College-West Jefferson (LTC), Delgado Community College-West Bank (WP), and Delgado Community College-College Park (CP). Participants enrolled between November 2003 and August 2005 and completed a short survey, containing primarily demographic information. After survey completion, they were randomly assigned to one of two conditions: the Opening Doors intervention, which included extra student advising and a \$1,000 stipend for each subsequent semester enrolled, or a control condition, which included neither of these benefits. In the current study, participants' self-reported age, experimental status, and community college attended were included.

The purpose of the Time 1 survey was to investigate the effects of the Opening Doors demonstration program after 1 year. Hurricane Katrina interrupted data collection for this wave. At the time of the hurricane, 492 participants had been involved in the study long enough to complete the 1-year follow-up survey. The Time 1 survey, which was conducted by trained interviewers over the phone, was far more in depth than the Baseline survey. It included additional demographic measures, such as number of children and children's ages. In addition,

it included a question assessing participants' educational optimism and measures of psychosocial resources and vulnerabilities, such as psychological distress and perceived social support. Participants also provided information on economic resources, including hours employed per week and access to regular childcare. When the interview was complete, participants were given \$20 gift certificates for their time. The Time 1 survey was administered to 492 (48.3%) of the original 1,019 participants prior to being interrupted by Hurricane Katrina. Independent samples *t*-tests, with a Bonferroni correction for multiple tests, detected no significant differences between the 492 who completed the Time 1 survey and the 527 who did not.

Between May 2006 and March 2007, researchers sought to locate the 492 participants who had completed both the Baseline and Time 1 surveys. Of these participants, 402 (81.7%) completed the post-Katrina survey, referred to as Time 2. The Time 2 survey was administered by telephone, at an average of 11.4 months after Hurricane Katrina (*SD* = 2.5 months). It included many of the same questions as Time 1, such as those related to educational experiences, psychosocial resources and vulnerabilities, and economic resources. In addition, participants were asked about their experiences during and after the hurricane, including hurricane-related stressors, post-hurricane mobility, childcare, and educational and occupational activities. At the end of the interview, participants were compensated with \$50 gift cards for their time. Independent samples *t*-tests, with a Bonferroni correction for multiple tests, detected no significant differences between the 402 participants who were re-assessed and the 90 **who did not on** **QA: did not what?** any of the Baseline or Time 1 variables included in the study.

Given our interest in retention after natural disasters, the current study only included participants who were both enrolled in college at the time of Hurricane Katrina and whose homes were affected by the hurricane. In addition, given findings of gender differences in post-hurricane psychopathology (e.g., Brewin et al., 2000; Ginexi et al., 2000) and social support given and received (e.g., Kaniasty & Norris, 1995; Norris et al., 2005), as well as in community college persistence (e.g., Mutter, 1992; Pascarella, Smart, & Ethington, 1986; Pascarella & Terenzini, 1983), it was evident that gender may be an important factor in determining educational outcomes. The small number of the remaining male participants (*n* = 5) did not permit looking into gender as a moderator of post-hurricane community college resumption. Furthermore, including male participants could increase statistical error in the analyses. Therefore, we opted to exclude male participants from the current study.

Of the 242 participants who remained in the sample, an additional 21 (8.7%) of the participants were dropped due to missing data. Independent-samples *t*-tests, again with Bonferroni corrections for multiple tests, were conducted for all the variables included in the study, and revealed that the participants who were dropped due to missing data were significantly less likely to have had regular childcare at Time 2 than those who had been retained, $t(239) = -3.86, p < .001$.

Variables

Community College Attended

As stated previously, participants in the study were enrolled in one of three community colleges at Baseline: Louisiana Technical College-West Jefferson (LTC), Delgado Community College-West Bank (WB), or Delgado Community College-City Park (CP). Students at all three schools can earn technical diplomas, certificates in technical studies, technical competency area credentials, and Associates degrees in a variety of areas. The first college, LTC, is located in Harvey, Louisiana, a large suburb on the West Bank area of New Orleans. Although the school sustained damage due to Hurricane Katrina, it is now fully operational. For the Fall 2006 semester, West Jefferson had 697 students, 52% of its typical enrollment (DCC Katrina Chronicles, 2005-2006). The second, WB, is situated in Algiers, was established in 1967, and is the only community college located west of the Mississippi River in the New Orleans area. The main building at WB sustained only some roof damage, and in December 2005, just a few months after the hurricane, the campus held a mini “intersession,” with free classes offered to all students affected by the hurricane (DCC Katrina Chronicles, 2005-2006). In Fall 2006, WB had 2,635 students, 44.1% of its pre-Katrina enrollment (DCC Katrina Chronicles, 2005-2006). The third site, CP, was the original site for Delgado Community College. The school sustained severe damages and was closed during the Fall of 2005. Its library, the Moss Memorial Library, which held 123,000 volumes and approximately 900 periodicals, was heavily damaged, and, as of April 2008, the campus continued to use interlibrary loan to provide its students access to books and additional reference materials (<http://www.dcc.edu>). By Fall 2006, CP served approximately 11,927 students, 40% of its typical enrollment pre-Katrina (DCC Katrina Chronicles, 2005-2006). Because of the nature of the statistical analyses, this variable was coded using contrast codes, one with LTC = 1 and all others = 0, the second with CP = 1 and all others = 0, and the third with WB = 1 and all others = 0. Of the 221 participants in the current study, 40 (18.1%) attended LTC, 124 (56.1%) attended CP, and 57 (25.8%) attended WB at Baseline.

Experimental Status

Participants’ experimental status, assigned after the Baseline assessment, was coded as 0 = Control, and 1 = Opening Doors.

Time Enrolled in Study

The time, in days, that participants were enrolled in the study prior to Hurricane Katrina was calculated by subtracting the date of enrollment from the date the hurricane hit New Orleans (August, 29, 2005).

Background Characteristics

A variety of background characteristics were used in this study, including participants' age, number of children under 18 years for whom they were responsible, and the age of their youngest child. In addition, participants' hours of employment, as well as whether they had access to regular childcare, from Time 1 and Time 2 were utilized.

Perceived Social Support

Perceived Social Support was assessed using nine items from the Social Provisions Scale (SPS; Cutrona & Russell, 1987). Items are rated using a 4-point Likert-type scale, from *strongly disagree* (1) to *strongly agree* (4). The nine items were selected to assess how much support participants perceive from the people in their lives. Although previous research on social support after natural disasters has focused on how much and what kind of support disaster survivors received (Kaniasty & Norris, in progress), it was decided to utilize this scale to be consistent with the Time 1 survey, thus enabling us to track changes in perceived social support over time. Sample items for the Social Provisions Scale are, "There are people I know will help me if I really need it" and "If something went wrong, no one would help me." Approximately half the items are reverse scored (Time 1 $\alpha = .83$, Time 2 $\alpha = .82$).

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Educational Optimism

At Time 1 and Time 2, participants were asked to rate their chances of graduating from college, using the following response options: *poor* (1), *fair* (2), *good* (3), *very good* (4), and *excellent* (5). This question was included in the Opening Doors Study to track participants' academic outlook over time.

Psychological Distress

Psychological distress was assessed using the K6 scale (Kessler, Barker, Colpe, Epstein, Groerer, Hiripi, et al., 2003), a widely used measure that was designed to discriminate between cases of serious mental illness and non-cases and to screen for anxiety and mood disorders. This measure has been used in previous research on the psychological functioning of Hurricane Katrina survivors (e.g., Galea, Brewin, Gruber, Jones, King, King, et al., 2007; Wang et al., 2007). It includes six items (e.g., "During the past 30 days, about how often did you feel nervous?") and uses the following response set: *all* (1), *most* (2), *some* (3), *a little* (4), and *none* (5) (Time 1 $\alpha = .70$, Time 2 $\alpha = .80$).

Time 2 Educational Status

Participants were asked if they had attended another college since Hurricane Katrina. This variable was coded as “Yes” = 1 and “No” = 0.

Hurricane-Related Stressors

Participants were asked to indicate if they experienced any of the following as a result of the hurricanes:

1. no fresh water to drink;
2. no food to eat;
3. felt their life was in danger;
4. lacked necessary medicine;
5. lacked necessary medical care;
6. had a family member who lacked necessary medical care;
7. lacked knowledge of safety of their children; and
8. lacked knowledge of safety of their other families members.

Participants were asked these questions for both Hurricane Katrina and Hurricane Rita, yielding a total of 16 items. Responses to each item were coded as “Yes” = 1 and “No” = 0. Scale scores were calculated by adding the total number of items endorsed ($\alpha = .83$).

Number of Moves

Participants were asked to indicate the number of moves they had made since the hurricanes. This was used as a continuous variable.

Time Since Katrina

The time between the Time 2 assessment and Hurricane Katrina (August 29, 2005), in days, was computed and used as a continuous variable.

Data Analysis

Data analysis was conducted using SPSS 15.0. Various heuristic analyses were conducted prior to tests of the study’s main objectives. Skew and kurtosis of each variable, as well as the presence of univariate outliers, were assessed through histograms and box-and-whisker plots. No transformations were made, as the data were fairly normally distributed and transformations did not eliminate the presence of univariate outliers. Univariate outliers were pulled in for each Post-Katrina Education Status group, as suggested by Tabachnick and Fidel (2007). Following these heuristic analyses, collinearity statistics were computed. While three roots had condition indices greater than 30, no dimension had more than one variance proportion greater than .50, indicating an absence of

multicollinearity (Tabachnick & Fidel, 2007). In addition, a correlation matrix was computed and none of the correlations exceeded $r = .70$.

Subsequent to these heuristic analyses, a step-wise binary logistic regression was performed. Variables were grouped into three categories. The first consisted of demographic and control variables: age, number of children, year youngest child was born, community college attended, and time enrolled in the study prior to Hurricane Katrina. The second set consisted of pre-hurricane resources that could have affected participants' likelihood of re-enrollment after the hurricane: experimental status, hours employed, regular childcare, social support, psychological distress, and educational optimism. The third set included these same measures, assessed after the hurricane, as well as hurricane-related stressors, number of moves since the hurricane, and time between Hurricane Katrina and the date participants were re-assessed. The dependent variable for each step of the analysis was re-enrollment in community college after the hurricane. The results of the analysis therefore indicates how well each variable predicts community college re-enrollment controlling for variables in previous steps, as well as those in the concurrent step.

RESULTS

The results of the logistic regression analysis are illustrated in Table 1. Demographic and control variables were entered in Step 1, and, as a group, these variables did not account for significant variance in post-hurricane re-enrollment, $\chi^2 = 10.03$, $p > .05$. However, attending LTC at baseline, relative to the other two schools, accounted for significant unique variance among the predictors (Wald's $\chi^2 = 4.05$, $p < .05$), and participants who had attended LTC were significantly more likely to have re-enrolled after the hurricane. Although Step 1 was non-significant, classification of cases improved from the baseline model (see Table 2): prior to entering demographic and control variables, 55.2% of the cases were correctly classified, whereas this increased to 61.5% with predictor variables in the model.

Next, pre-hurricane resources variables were entered in Step 2. After entering these variables, the model was still not statistically significant ($\chi^2 = 18.78$, $p > .05$). However, educational optimism was a significant individual predictor of post-hurricane re-enrollment (Wald's $\chi^2 = 6.58$, $p < .01$). That is, participants with higher pre-hurricane optimism about their chances of graduating college were more likely to have re-enrolled after the storm. After Step 2, 63.3% of cases were correctly classified.

Lastly, post-hurricane variables, including resources and hurricane-related stressors, were entered in Step 3. These variables, as a set, were statistically significant, above and beyond demographic and pre-hurricane variables ($\chi^2\Delta = 25.52$, $p < .001$), and the model as a whole now significantly predicted post-hurricane re-enrollment ($\chi^2 = 44.29$, $p < .001$). Three post-Katrina variables were

Table 1. Results of Logistic Regression Predicting Post-Katrina Re-Enrollment

	β	SE β	Wald χ^2	df	e^{β} (odds ratio)	Chi-square total	Chi-square change
Constant	-.21	.14	2.39	1	.81		
1. Demographics							
Age	.01	.04	.10	1	1.01	10.03	10.03
Number of children	-.12	.15	.66	1	.89		
Year youngest child was born	-.01	.05	.08	1	.99		
LTC	.87	.43	4.05*	1	2.40		
CP	-.18	.33	.28	1	.84		
Time in study	<.01	<.01	.71	1	1.00		
2. Pre-Katrina Variables							
Experimental status	.25	.29	.73	1	1.28	18.78	8.74
T1 hours employed	-.01	.01	.99	1	.99		
T1 regular childcare	-.09	.36	.06	1	.92		
T1 social support	<.01	.04	.01	1	1.00		
T1 psychological distress	<.01	.05	.01	1	1.00		
T1 educational optimism	.54	.21	6.58**	1	1.71		
3. Post-Katrina Variables							
Exposure scale	-.01	.06	.76	1	.95	44.29***	25.52***
Time since Katrina	<.01	<.01	2.08	1	1.00		
Moves since Katrina	-.21	.13	2.73	1	.81		
T2 hours employed	-.02	.01	5.32*	1	.98		
T2 regular childcare	.29	.37	.65	1	1.35		
T2 social support	.02	.05	.17	1	1.02		
T2 psychological distress	.09	.04	5.55*	1	1.09		
T2 Educational optimism	.55	.18	9.65**	1	1.74		

*p < .05, **p < .01, ***p < .001.

Table 2. Classification Statistics for Each Step in Logistic Regression Model

Observed	Predicted		Percentage correct
	Yes	No	
No Predictors			
Yes	0	99	0%
No	0	122	100%
Overall percentage			55.2%
1. Demographics			
Yes	28	71	28.3%
No	14	108	88.5%
Overall percentage			61.5%
2. Pre-Katrina Variables			
Yes	41	58	41.4%
No	23	99	81.1%
Overall percentage			63.3%
3. Post-Katrina Variables			
Yes	58	41	58.6%
No	31	91	74.6%
Overall percentage			67.4%

significant unique predictors of re-enrollment: hours employed (Wald's $\chi^2 = 5.32$, $p < .05$); psychological distress (Wald's $\chi^2 = 5.55$, $p < .05$); and educational optimism (Wald's $\chi^2 = 9.65$, $p < .05$). Participants who worked fewer hours, had lower levels of psychological distress, and higher educational optimism were more likely to have re-enrolled in school. An additional variable, number of moves, was a marginally significant predictor of re-enrollment (Wald's $\chi^2 = 2.73$, $p < .10$), such that fewer moves were associated with a greater likelihood of re-enrollment. After Step 3, the percentage of cases correctly classified was 67.4%. Notably, the model was better at predicting participants who did not re-enroll after the hurricane (74.6% correct) than it was at predicting those who did (58.6% correct).

DISCUSSION

The purpose of this study was to explore predictors of community college re-enrollment in a sample of low-income women who lived in areas affected by Hurricane Katrina. In doing so, we hoped to provide insight on the psychosocial

resources that foster educational resilience after a major stressor that altered survivors' daily lives. We hypothesized that participants' level of educational optimism, both prior to and after the hurricane, would be a significant predictor of re-enrollment. Based on previous research on community college persistence and post-hurricane psychological functioning, background characteristics and other pre- and post-hurricane resource variables, including social support, regular childcare, and employment, exposure to the hurricane, and moves since Katrina, were also included in a stepwise logistic regression model.

An important strength of the study was its use of pre-Katrina data, which permitted an investigation of whether pre-hurricane resources contribute to post-hurricane educational activities, above and beyond hurricane exposure and experiences thereafter. Inclusion of pre-hurricane data is in marked contrast to most disaster studies, which include only data from after the disaster and thus cannot reliably control for pre-disaster functioning (Norris, Friedman, Watson, Byrne, Diaz, & Kaniasty, 2002).

Consistent with our hypothesis, educational optimism, measured prior to and approximately a year after Hurricane Katrina, was a significant predictor of re-enrollment. The results of the study thus provide evidence that optimism about graduating from college is an important psychological resource for community college students, particularly low-income women facing major stressors. A strong belief in the possibility of achieving this educational goal could promote re-enrollment after a life-altering event, even as survivors strive to reestablish other areas of their daily lives. Community colleges should work to foster this resource. Potential avenues of doing so would be to present students with data about the financial pay-off of earning a college degree, as well as having graduates share their educational successes in the face of various obstacles.

Particularly in light of the high attrition rates in community colleges (Summers, 2003), especially in 2- and 4-year community colleges in Louisiana (Southern Regional Education Board, 2003), it is noteworthy that a single item of educational optimism could significantly predict re-enrollment after the hurricane. Colleges seeking to screen students at risk of dropping out might consider administering this item at various stages of their education. At the same time, future studies should deploy more extensive measures of educational optimism. Measures of career optimism, such as the Career Futures Inventory (Rottinhaus, Day, & Borgen, 2005), could be adapted for educational goals to this purpose. Interventions aiming to increase retention could then target students with low levels of this resource.

In addition to educational optimism, a few other variables emerged as significant predictors of re-enrollment. First, attending one of the community colleges, LTC, was associated with a greater likelihood of re-enrollment relative to the other two schools. These results parallel the Fall 2006 enrollment at each school, as LTC had 52% of its usual enrollment, while WB had 44.1% and CP had approximately 40% of its pre-Katrina enrollment (DCC Katrina Chronicles,

2005-2006). The most likely explanation is that the LTC participants experienced the least damage among the three colleges. Although post-hoc analyses detected no significant differences in hurricane-related stressors endured among students at the three schools, students at LTC might have lived in communities that were less damaged, and were subsequently less hindered in their efforts to reconstruct their lives. It might also be the case that students at LTC were more socially and academically integrated at their college than those at the other schools, which affects students' persistence and commitment to long-term educational goals and persistence (e.g., McClenney & Marti, 2006; Pascarella et al., 1986; Pascarella & Terenzini, 1983; Tinto, 1997).

In addition, a marginally significant predictor of re-enrollment was the number of moves experienced between the hurricane and the post-hurricane assessment. This finding suggests that a lack of stable residence can be a major hindrance to re-enrollment. Future research should explore the ways in which frequent moves after a hurricane lead to declines in re-enrollment. For example, residential instability could temporarily lessen students' educational goal commitment, as their focus could shift to more pressing goals of finding long-term housing and re-establishing routines. To counter the negative impact of frequent moves on re-enrollment after natural disasters, community college services, both in the affected area and in communities to which survivors have relocated, could connect students with resources related to housing and advocate on students' behalf if necessary.

Residential instability might also be a proxy indicator of low psychosocial resources. In particular, as mentioned previously, displacement after a disaster is associated with greater depression and post-traumatic stress (Najarian et al., 2001), as well as lower socioeconomic status (Brodie et al., 2006). In non-disaster contexts, previous research has also found frequent moves to be associated with decreased tangible support and companionship (Magdol & Bessel, 2003), health declines (Larson, Bell, & Young, 2004), and increases in psychological distress among women (Magdol, 2002). Number of moves, therefore, could be related to participants' access to psychosocial and economic resources that would enable them to re-enroll in school after the hurricane.

In a similar vein, participants' hours of employment were inversely related to their likelihood of community college re-enrollment. This, too, could be a proxy for socioeconomic status in the aftermath of Hurricane Katrina. Participants with lower economic resources may have been more likely to prioritize stable employment over returning to school. This might have been particularly the case for participants who were unable to navigate the bureaucracies that might help them to re-establish their lives. Community college personnel, in the affected area and elsewhere, should reach out to survivors of major stressors to provide them with information about financial aid. Reduced tuition or scholarships to survivors could alleviate financial stress and thereby promote re-enrollment.

Lastly, participants' psychological distress after Hurricane Katrina was a negative predictor of re-enrollment. This study adds to research connecting psychological distress and educational attainment (e.g., Kessler et al., 1995), and provides evidence that increased psychological distress after natural disasters can prevent adult survivors from re-engaging in their long-term goals. To offset the potential negative impact of psychological distress on educational attainment, community colleges could work to relocate former students and inform them of counseling services both on campus and in the community. This finding also provides support for well-advertised and affordable counseling services for natural disaster survivors.

It is likely that there are other important variables not included in the model that may have accounted for additional variance between the two groups, such as bereavement, home damage, and monies received from FEMA, non-profit organizations, and insurance companies. In addition, post-Katrina educational opportunities and experiences might have influenced decisions to go back to school. Previous research on community college "stop outs" has found that the amount of educational experience, indicated by number of credits attained and semesters completed, is a significant predictor of re-enrollment (Berkovitz & O'Quin, 2006-2007). Perhaps survivors who were closer to attaining their goal of graduating college were more likely to return to school after the hurricane. Other factors related to education resumption might have been the proximity of and public access to the community college, course availability, the option to transfer credits, and campus-based resources.

Because the dataset consisted of only dichotomous measures of educational enrollment, we were unable to investigate whether there were differences in participants who re-enrolled on a part-time basis and those who returned to school full-time, or whether pre-Katrina course load affected outcomes. A higher course load at both time points could indicate a greater commitment to attaining one's degree, as well as greater levels of financial and psychosocial resources. Furthermore, the number of courses matters in that it is directly related to when participants will graduate and reap the financial benefits of a post-secondary degree. The dichotomous nature of the outcome also did not allow for investigating the timing of participants' return to school. It could be that there are differences, for example, in predictors of returning to school within the first 6 months of the disaster, as compared to those who re-enrolled a year later. This study also relied on self-report data, and future research should corroborate participant reports with school records and transcripts. Such data could also facilitate investigation of other outcomes, including number of credits taken and GPA. Further research should also employ more nuanced measures of social support, rather than general perceptions of support from others, assessing type of support (e.g., emotional or tangible) and from whom it was received (Kaniasty & Norris, in progress). It could be that some types of support are more important to education resumption than others.

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Lastly, it is worth emphasizing limits to external validity of this study. First, the sample includes only low-income women, the majority of whom were single parents and African American, and is therefore not representative of all community college students or the full New Orleans population. Researchers should explore predictors of community college re-enrollment among other populations, and after other natural disasters and major stressors. Despite this limitation, the results of the study could provide insight into factors that predict academic outcomes among community college students facing other major stressors, including those related to natural disasters and the current economic recession.

In addition to addressing the limitations of the current study, the processes by which educational optimism impacts educational retention and post-disaster educational functioning should be investigated, as well as the longer-term educational outcomes of survivors of natural disasters. It would also be interesting to explore whether the predictors of community college resumption are consistent over time.

Despite its limitations, the current study represents a unique contribution to our understanding of community college retention. It is the first study, to our knowledge, to explore predictors of community college persistence in the aftermath of a major natural disaster, and did so using longitudinal data, thereby determining whether pre-disaster factors were significant predictors of community college re-enrollment. While community college students often encounter the daily stressors of balancing school and work and raising young children, some face more significant stressors that alter the rhythms of their everyday lives. In response to such stressors, students face many tasks, including finding housing, employment, and childcare, and educational pursuits could end up falling by the wayside. To re-enroll in college in the face of these challenges represents an impressive commitment to educational goals.

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