

ICPSR BULLETIN

2014 ICPSR Undergraduate Research Paper Competition First-Place Winner

**Cultural Mismatch in the Achievement Gap: Self-construal as a
Mediator Between Socioeconomic Status and Academic Achievement**

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2014 ICPSR Master's Research Paper Competition First-Place Winner

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From Director George Alter

We are very pleased to present the first-place winners of the 2014 ICPSR Research Paper Competitions in this special edition of the Bulletin. This year, it was a pleasure to see the high quality and diversity of topics in the submissions.



Lorraine Blatt of Grinnell College earned first-place in the undergraduate competition with her paper “Cultural Mismatch in the Achievement Gap: Self-construal as a Mediator between Socioeconomic Status and Academic Achievement” which tests the differences in the effect of interdependent and independent self-construal on college students’ success as measured by their GPA.

Peter Lista of Indiana University — Bloomington won the master’s competition for his paper “Organization Decision-Making and the Market Environment: Examining Contingency in Organizational Behavior” which examines the perceptions of the market affect decision-making structures within organizations irrespective of other constraints.

Jian Li of Central University of Finance and Economics, Beijing, China won the first-place award in the Resource Center for Minority Data (RCMD) competition for his paper “Identify Young Adults with Serious Suicidal Ideation: A Population-based Study” which considers potential risk factors of suicidal ideation among young adults.

Congratulations to the winners and many thanks to all of the entrants for sharing their hard work with us!

About ICPSR

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Cultural Mismatch in the Achievement Gap: Self-Construal as Mediator Between
Socioeconomic Status and Academic Achievement

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Abstract

This secondary analysis explored whether an interdependent self-construal (defined by valuing relationships with others, conformity, and adjusting oneself to maintain social harmony), as opposed to an independent self-construal (valuing standing out, stability across situations, and promoting one's own goals) was related to lower college GPAs for students with low socioeconomic status. This research is informed by the cultural mismatch model (Stephens et al. 2012a) and uses Gates Millennium Scholars data (Bill & Melinda Gates Foundation). Multivariate regression analyses determined that those who did not think good luck was important, relied on their cultural group for support, and did not have a positive self-concept (interdependent tendencies) had significantly lower GPAs, and these variables were mediators between socioeconomic status and academic achievement. A second multivariate regression demonstrated that those with a largely salient interdependent self-construal who self-reported improved independence while in college had significantly higher GPAs than those who did not.

Cultural Mismatch in the Achievement Gap: Self-Construal as Mediator Between Socioeconomic Status and Academic Achievement

Institutions of higher education in the United States have increased emphasis on matriculating student bodies representing a wide range of social classes. Though the diversity of students has increased, the achievement gap between students of low socioeconomic status and their peers persists (Stephens, Fryberg, Markus, Johnson, and Covarrubias, 2012a). Stephens et al. (2012a) attribute a portion of this achievement gap to a cultural mismatch model, based on their finding that more than 80% of administrators from first-tier American colleges and universities classified the culture of their institutions as more independent than interdependent. The cultural mismatch model is the idea that educational institutions in the United States facilitate the success of students with a salient independent self-construal, or way of defining the self, and therefore deter the success of students with a more salient interdependent self-construal.

Markus and Kitayama (1991) studied self-construal cross-culturally and found East Asians to be more interdependent and holistic in their thinking than Westerners, who demonstrated more independence and individualism in their thinking. Having an interdependent self-construal contained aspects such as being more connected to and conforming to social context and occupying a role within said social context to foster cohesive harmony (Markus & Kitayama, 1991). Having an independent self-construal is defined as being more separate from social context and promoting one's own individual goals and unique attributes that cause one to stand out (Markus & Kitayama, 1991). Stephens et al.'s (2012a) research found that these cultural differences were paralleled with different social classes in the United States; individuals with lower socioeconomic status tended to be more interdependent while individuals with higher socioeconomic status tended to have a more independent self-construal. Stephens et al. (2012a)

also found that self-construal mediated the relationship between socioeconomic status and academic achievement in a sample of first-generation college students.

Stephens et al. (2012a) used a variety of measures to determine that the first-generation sample of college students demonstrated more interdependence than independence. For example, the motive for attending college was much more influenced by family in first-generation college students than non-first-generation students. Statistically, first-generation students do not perform as well academically as their peers; they also have higher dropout rates and participate in fewer extra-curricular activities (Billson & Terry, 1982; Richardson & Skinner, 1992; Terenzini et al., 1994 in Stephens et al., 2012a). Stephens et al. (2012a) attribute these shortcomings partially to the cultural mismatch model and the idea that first-generation students have an interdependent self-construal that is not compatible with the independently structured expectations of their professors and institution overall. In order to test the cultural mismatch model, Stephens et al. (2012a) provided the participants with a welcome letter from their institution with either an interdependent or independent culture made salient within the letter. Stephens et al. (2012a) then had participants complete an anagram task in one study and a tanagram task in another. In both studies, first-generation students performed less well than non-first-generation students when independence was made salient, but this gap in performance was not present when interdependence was made salient (Stephens et al., 2012a). The fact that this minor manipulation affected task performance demonstrates that self-construal has a large impact on students and certainly creates achievement obstacles.

Stephens et al. (2012b) also looked at physiological implications of cultural mismatch by testing participants' cortisol levels following the reading of independently or interdependently salient welcome letters, and supporting effects were found; first-generation students had

significantly higher cortisol levels (indicating more stress) after reading the independent letter than the non-first-generation students and vice versa for the interdependent letter (Stephens et al., 2012b). Stephens et al. (2012b) also tested emotional reaction and found that first-generation students had more positive feelings about the interdependent letter and more negative feelings about the independent letter. These experiments exemplify the discomfort created by contrasting self-construals and provide a strong possible explanation for one reason why first-generation students and students of low socioeconomic background are struggling academically in colleges and universities. Stephens et al. (2012a, 2012b) provide a nice experimental framework with supporting evidence for the cultural mismatch model. This quantitative research explores the cultural mismatch model with a much larger sample of survey data from low-income ethnic minorities, who are a part of the Gates Millennium Scholars dataset (Bill & Melinda Gates Foundation) attending institutions of higher education, and their actual academic outcomes (rather than task performance).

This research poses two hypotheses. The first is that having a largely salient interdependent self-construal mediates the relationship between socioeconomic status and academic achievement, and individuals with low socioeconomic status who have a largely interdependent self-construal will demonstrate less academic achievement than their peers with a more salient independent self-construal. The second hypothesis is that those students with a more salient interdependent self-construal who report improved independence while at college will demonstrate higher academic achievement than those with a salient interdependent self-construal who do not report improved independence while at college.

Method

Participants

The sample of this quantitative research is taken from the Gates Millennium Scholars data (Bill & Melinda Gates Foundation). The Bill & Melinda Gates Foundation founded the Gates Millennium Scholars Program (GMS) in 1999 to help close the achievement gap between minority students with low socioeconomic status and their counterparts. GMS awarded 4,000 scholarships in its first year and has awarded 1,000 scholarships every year since to individuals who meet the aforementioned criteria and are also seen as high achievers. The Bill & Melinda Gates Foundation is the primary investigator for the survey conducted longitudinally with five cohorts made up of roughly half scholarship recipients and half a representative sample of non-scholarship recipients. This research focuses on cohort five, who were awarded the scholarship in 2004, and uses data from the baseline survey in 2004 and the first follow-up survey conducted in 2007. The survey is Web-based and asks a spectrum of questions both academic and personal. This research uses responses from 1,645 students (cases with missing variables were excluded from analyses). The GMS data were originally collected to monitor the success of GMS scholars on a variety of measures, often in comparison to their non-GMS counterparts. (Note: Restricted files of this dataset exist, but this research was done using the public data files).

Procedure

For the purpose of this research, socioeconomic status was operationalized using the following variables from the GMS dataset: “Mother’s Education Level,” “Parent Contribution Towards College Finances,” and “Student Feels He or She Can Afford the Same Things as Others.”

The self-construal measures for the first hypothesis were operationalized using variables that coincided with previous literature outlining a dichotomy between independence and interdependence. The variables chosen for this analysis were “Good Luck is Important,” based on the notion that those with a largely salient independent self-construal attribute failure to external causes (e.g. good luck) and successes to internal causes, while those with a largely salient interdependent self-construal perceive the self as malleable and attribute failure to lack of sufficient effort, not external causes (Heine et al., 2001; Markus & Kitayama, 1991); “Considered Leader,” based on the notion that those with a largely salient independent self-construal are more likely to exhibit leadership and be comfortable standing out as leaders while those with a largely salient interdependent self-construal prefer to fit in with the majority (Hardin, Leong, & Bhagwat, 2004; Kim, 2002); “Chose Major Based on Ethnicity,” based on the notion that those with a largely salient interdependent self-construal conform to a culturally designated role (Markus & Kitayama, 1991); “Talk to Family about Personal and Academic Problems,” based on the notion that those with a largely salient independent self-construal derive motivation from autonomous, agency-oriented thought while those with a largely salient interdependent self-construal derive motivation from familial goals and familial responsibility (Stephens et al., 2012a); this was also the rationale for the variables “Rely on Cultural Group for Support” and “Family Encourages to Stay in College” (despite having the same rationale, these variables did not load together on a factor analysis so they remained separate); “Need More Control/Others Stop Me from Getting Ahead,” based on the notion that those with a largely salient independent self-construal want to succeed above others, while those with a largely salient interdependent self-construal want to succeed to the maximum level expected of them along with others, not ahead of others (Heine et al., 2001; Markus & Kitayama, 1991); “Have

Much to be Proud of,” based on the notion that those with a largely salient independent self-construal have a self-enhancing bias while those with a largely salient interdependent self-construal have a modesty bias (Markus & Kitayama, 1991); and finally, “Non-Cognitive Score: Positive Self Concept,” based on the independent self-construal modesty bias and the fact that a component of this non-cognitive score in the baseline measure was strictly designed to measure independence (a higher self-appraisal score meant higher independence). This non-cognitive score is the only variable taken from the 2004 baseline survey.

All necessary self-construal variables were recoded in order to reflect the following scale: 1=most independent response through 5=most interdependent response. For example, for the variable “Chose Major Based on Ethnicity,” “Strongly Agree” is the more interdependent response so the variable was coded so that 5=Strongly Agree, while for the variable “Have Much to be Proud of,” “Strongly Agree” is the more independent response so the variable was coded so that 5=Strongly Disagree.

Academic achievement was operationalized using the “Current GPA” variable, which grouped students into four quartiles with quartile one being the lowest GPAs (0-1.00) and quartile four being the highest GPAs (3.00-4.00).

The following variables were controlled for in all analyses: “Race,” which was converted into a dummy variable using 1=White, 2=Non-White (Native American, Hawaiian, Asian, and Black), “Gender” (1=Male, 2=Female); “GMS scholarship recipient” (1=Scholar, 2=Non-recipient); and whether the student is “Currently Working for Pay” (1=Yes, 2=No). In addition to controlling for race and gender, the other two controls were selected for their possibly confounding factors. For example, since only half of the students in the sample are GMS scholars, it is possible that those who are scholars will have higher GPAs than those who are not

because of their GMS programming and because they were selected to be scholars, indicating possibly higher academic achievement in high school. Additionally, students who work for pay while in school may have statistically lower GPAs because of reduced time to spend on academics. For the second hypothesis, all of the socioeconomic variables in the first hypothesis were used as controls.

For the second hypothesis, the mean self-construal scores for all 1,645 cases were determined by taking the aggregate mean of the self-construal variables used in hypothesis one. Every case with a mean higher than 3.5 was determined to have a largely salient interdependent self-construal and was used for analysis in the second hypothesis (N=1,021). The second hypothesis utilized the GMS dataset variables “School Improved Oral Communication,” “School Improved Analytic Thinking,” and “School Improved Independence.”

Factor analyses were performed, which resulted in the combining of certain variables that loaded on the same factor and had high reliability. For example, all three non-control variables in the second hypothesis loaded on the same factor and had a high Cronbach’s alpha, so they were combined to create one variable, “School Improved Oral Communication, Analytic Thinking, and Independence,” with 1=Strongly Agree (most independent response) and 5=Strongly Disagree (most interdependent response). Three multiple regression analyses were conducted to test the mediating effects of the self-construal variables for the first hypothesis. One multiple regression analysis was conducted to test the second hypothesis.

Results

Table 1. Hypothesis 1: Unstandardized Coefficients (t-values) Regressing GPA on Socioeconomic Status, Self-Constraint, and Controls

Variable	Model 1	Model 2	Model 3
Mother's Education	0.03 (0.99)		0.01 (0.25)
(Less than high school-graduate degree)			
Parent Contribute Towards College Finances	-0.05 (-0.72)		-0.07 (-0.90)
(1=Yes, 2=No)			
Afford Things Other Students Do	-0.20 (-2.82)**		-0.10 (-1.38)
(1=Yes, 2=No)			
Good Luck is Important		-0.06 (-1.65)*	-0.08 (-1.87)*
(1=Strongly Agree-5=Strongly Disagree)			
Considered Leader		0.02 (2.44)**	0.02 (1.91)*
(1=Strongly Agree-5=Strongly Disagree)			
Chose Major Based on Ethnicity		0.01 (0.41)	0.04 (0.23)
(1=Strongly Disagree-5=Strongly Agree)			
Talk to Family about Personal and Academic Problems		-0.00 (-.06)	-0.00 (-0.26)
(1=Strongly Disagree-5=Strongly Agree)			
Need More Control/Others Stop Me From Getting Ahead		0.12 (5.72)***	0.12 (5.38)***
(1=Strongly Agree-5=Strongly Disagree)			
Rely on Cultural Group for Support		-0.04 (-1.38)	-0.05 (-1.67)*
(1=Strongly Disagree-5=Strongly Agree)			
Family Encourages to Stay in College		-0.03 (-1.25)	-0.04 (-1.44)
(1=Strongly Disagree-5=Strongly Agree)			
Have Much to be Proud of		0.04 (1.07)	0.03 (0.61)
(1=Strongly Agree-5=Strongly Disagree)			
Non-Cognitive Score: Positive Self-Concept		-0.12 (-3.04)***	-0.13 (-3.10)***
(1=Strongly Agree-5=Strongly Disagree)			
Race	0.30 (3.77)***	0.31 (3.99)***	0.27 (3.24)***
(0=Non-White, 1=White)			
Gender	0.03 (0.36)	0.05 (0.73)	0.06 (0.81)
(1=Male, 2=Female)			
Work for Pay	0.09 (1.11)	0.11 (1.57)	0.16 (1.97)*
(1=Yes, 2=No)			
Scholarship Recipient	-0.17 (-2.03)*	-0.03 (-0.38)	-0.02 (-0.16)
(1=Yes, 2=No)			
F	4.44***	6.43***	5.19***
R²	0.03	0.07	0.08

Table 1. N=1645, *p<.05, **p<.01, ***p<.001, (one-tailed significance). For the mediating self-construal variables, higher value indicates interdependent self-construal.

The three regression models in Table 1 provide some evidence that the self-construal variables serve as a mediator between the socioeconomic status variables and academic achievement (GPA quartile). This is indicated by the fact that the socioeconomic variable of “Afford Things Other Students Do” is significant in the first regression model, which uses only socioeconomic status and the control variables to predict variance in academic achievement, but is not significant in the third model, which includes the self-construal variables. The third model supports the cultural mismatch model and significantly predicts about 8% of the variance in academic achievement. In the third model, the self-construal variables that are significant in the direction of the hypothesis (more salient interdependence predicts lower academic achievement) include “Good Luck is Important” ($p < .05$), “Rely on Cultural Group for Support” ($p < .05$), and “Non-Cognitive Score: Positive Self-Concept” ($p < .001$). There were also two variables that were significant in the opposite direction of the hypothesis (more salient interdependence predicts higher academic achievement): “Considered Leader” ($p < .05$) and “Need More Control/Others Stop Me from Getting Ahead” ($p < .001$).

Table 2. Hypothesis 2: Unstandardized Coefficients (t-values) Regressing GPA on School Improved Independence and Controls

Variable	
School Improved Oral Communication, Analytic Thinking, and Independence	-0.05 (-2.01)*
(1=Strongly Agree-5=Strongly Disagree)	
Race	0.40 (4.03)***
(0=Non-White, 1=White)	
Gender	0.09 (0.95)
(1=Male, 2=Female)	
Work for Pay	0.05 (0.57)
(1=Yes, 2=No)	
Scholarship Recipient	-0.27 (-2.50)*
(1=Yes, 2=No)	
Mother's Education	0.03 (0.86)
(Less than high school-graduate degree)	
Parent Contribute Towards College Finances	0.00 (0.05)
(1=Yes, 2=No)	
Afford Things Other Students Do	-0.17 (-1.96)*
(1=Yes, 2=No)	
F	4.01***
R²	0.05

Table 2. N=1021, *p<.05, **p<.01, ***p<.001

The multiple regression analysis displayed in Table 2 utilized a sample of 1,021 cases, all of whom had a mean score of 3.5 or higher on the aggregate of self-construal measures reflected in Table 1, signifying a more salient interdependent self-construal. Table 2 indicates that the students with a largely interdependent self-construal who self-reported that their school improved their oral communications skills, analytic thinking skills, and overall independence had significantly higher GPAs than those largely interdependent students who did not feel their school facilitated improvement in these areas. Overall, these variables explain about 5% of the variance in GPA.

Discussion

The results of the first multivariate regressions (displayed in Table 1) indicate that self-construal variables have some mediating effect on the relationship between socioeconomic status and academic achievement. For the mediating self-construal variables, if the coefficient is negative, interdependence has a negative impact on GPA, which is what the hypothesis predicts. Thus, those who exhibit the interdependent tendencies of disagreeing that good luck is important and relying on their cultural group for support have statistically worse GPAs. The most significant variable in the direction of the hypothesis is positive self-concept. This variable rated students on their level of independence in 2004, so its predictive ability of students' GPA in 2007 demonstrates strong support for the cultural mismatch model. This significance exemplifies that students who had the highest ratings of independence in 2004 had the highest GPAs in 2007.

The significant positive coefficients, however, suggest that interdependence, rather than independence, has a positive impact on GPA, which is contrary to the hypothesis. However, the positive significant coefficients do not necessarily refute the hypothesis, but instead probably demonstrate an issue of construct validity. For example, agreeing or disagreeing with the statement "others stop me from getting ahead" does not necessarily reflect a student's desire to stand out from his or her peers, which is the construct the variable was chosen to measure. Rather, regardless of self-construal, those with good GPAs probably do not feel held back at all, let alone by others, so this variable certainly presents a confound that explains the strong significance in the opposing direction of the hypothesis.

The results of the second hypothesis displayed in Table 2 indicate that the variable encompassing self-reported improved oral communication skills, analytic thinking skills, and independence was significant. Thus, students with a largely interdependent self-construal who

report improvement in these areas have higher GPAs than those with a largely interdependent self-construal who do not report improvement. This finding heavily supports the cultural mismatch model with the notion that the more acclimated students become to their institution's independent structure, the more academic achievement they demonstrate.

For all regression analyses, the control variable of race was significant, showing a large discrepancy in academic performance where White students significantly outperform non-White students. Since all but 33 of the White students in the dataset are Hispanic, this demonstrates that variance in GPA also exists among different ethnic minorities.

Conclusion

While these data analyses produced significant findings in support of the cultural mismatch model, the dataset did have limitations that could have possibly prevented more confirmatory results. For instance, the first hypothesis examined self-construal variables as a mediator between socioeconomic status and academic achievement, and while there was significant evidence of a mediating effect, a stronger effect may have occurred if the sample were more diverse in socioeconomic status and demonstrated a stronger initial relationship of socioeconomic status predicting variance in academic achievement. In addition, the sample for the second hypothesis looked only at students with a mean self-construal score that was predominantly interdependent, and it still included a majority of the students (62%). This supports the assumption that low socioeconomic status is correlated with an interdependent self-construal, which is in line with the research hypotheses. However, because this sample was not representative of college students with higher socioeconomic status and a largely independent self-construal, no major comparative assertions can be made. Furthermore, this dataset is not necessarily representative of college students with low socioeconomic status since at least half of

the students in the sample were definitely high achievers with a very good high school performance record. Thus, it is hard to say if this sample reflects students who may have been average or below in high school but still continued on to higher education. Third, the results highlight definite issues with construct validity when operationalizing self-construal as was indicated by the significant findings in the opposite direction of the first hypothesis. Finally, GPA is not necessarily a sufficient measure of academic achievement, especially in this dataset since it is not standardized across institutions and it is split up into quartiles, which minimizes room for expressed variance. Future research could address these methodological issues with a more representative sample and better construct coverage.

Despite the shortcomings of this research, it still demonstrates important issues regarding the presence of cultural mismatch. Many colleges and universities are seeking to increase the socioeconomic diversity of their student bodies and are doing so by admitting larger proportions of low-income and first-generation college students; in fact, at four-year American colleges and universities, about one in six students is a first-generation college student (Saenz, Hurtado, Barrera, Wolf, & Yeung, 2007 in Stephens et al., 2012a). Once low-income and or first-generation students matriculate to institutions of higher education, if there is a cultural mismatch with the school, the students will not be equipped for high academic achievement as well as their more independent peers. Since the data provide evidence that students who feel as though college improved their independent tendencies have greater academic achievement, more research could be done on how to implement programming in order to increase independent skills and/or how to decrease the independent nature of institutions to make them more accessible to those with a largely interdependent self-construal. For example, Stephens et al. (2012a) suggest that even taking away the “independent study” wording of schoolwork and

classifying it in ways such as a “guided research project with a faculty member” could alleviate some of the cultural mismatch that contributes to students with an interdependent self-construal’s inferior success.

In conclusion, there are certainly a plethora of mediators in the relationship between socioeconomic status and academic achievement. The cultural mismatch model proposes one explanation and possible solutions for ways to reduce the gap in achievement among students with low socioeconomic status and those with higher socioeconomic status, and this secondary analysis provides further evidence in favor of the model.

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Organization Decision-Making and the Market Environment:
Examining Contingency in Organizational Behavior

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ABSTRACT

Uncertainty in an organization's environment can have profound implications for its internal structure and decision-making processes. Most sociological research looking at this phenomenon has focused on using self-reported measures—like member perceptions—when looking at environmental uncertainty. Analysis of the market, however, has often relied on independent, seemingly “objective” measures. This reliance on impersonal measures of uncertainty leaves many questions about the relationship between the market and the organization unanswered. Sociologists especially should be skeptical of research that does not include member perceptions because it erroneously decouples the organization from the individuals embedded within it. This paper aims at correcting this in the literature by showing that perceptions of the market affect decision-making structures within organizations irrespective of other constraints. Controlling for a host of individual, organizational, and external factors, I find that higher levels of perceived market competitiveness are associated with a decentralized decision-making authority within the organization.

Organization Decision-Making and the Market Environment: Examining Contingency in Organizational Behavior

Historically, many of the main paradigms within organizational sociology have been interested in how the external environment affects organization-level strategy and structure (e.g., Lawrence and Lorsch 1967; Pfeffer and Salancik 1978; Hannan and Freeman 1989; Scott 2001). In contemporary organizational sociology, institutional and other field-level theories of organizational behavior have become increasingly ubiquitous and have largely replaced the other paradigms in the literature. More often than not, however, institutionalism overlooks how successful organizations must act to adapt to their immediate environment focusing instead on the conforming pressure of institutional norms and concern for legitimacy (DiMaggio and Powell 1983), regardless of its effect on organizational efficiency (Meyer and Rowan 1973). There is little doubt that institutional logics have an impact on organizational behavior, though the local environment is equally important yet often ignored by recent scholarship.

One early paradigm, contingency theory, can speak to the direct link between the organization and its environment, which institutionalism too frequently overlooks. These two paradigms arose in direct opposition to each other, with institutionalism focusing on the implicit rules and institutional logics of the field and contingency theory focusing on understanding how organizations create “fit” with their environment. Contingency theory suggests that a better way to view organizational behavior is by considering how the local environment constrains and patterns behavior as organizations try to adapt to its demands. Still, while much of the research in contemporary organizational sociology concerns itself with these types of relationships, there is a noticeable lack of recent empirical research connecting some *specific* organization-level outcomes with *specific* environmental pressures.

Existing in the literature, moreover, is a noticeable disconnect between researchers who study *environmental uncertainty* using subjective measures (e.g., individual's perceptions of uncertainty) and those researchers interested in *market uncertainty* who rely on arguably more objective measures like concentration ratios, degree of import penetration, or trade liberalization. For sociologists accustomed to conceptualizing uncertainty as perception, not having an empirical parallel for measuring markets should be troubling. Decoupling the organization's behavior from the actions of people embedded within it too frequently ignores the realities of organizational life. Additionally, not unlike the more general conceptualization of "the environment," when an organization acts in response to a change in its *market* those actions too have lasting implications for the organization's structure and strategic choices. By asking how the market—or more accurately, the market as organization members perceive it—affects where in the organization decision-making happens, scholars can develop more accurate theories about organizational behavior and collective action. Measuring competitiveness of the market using organization members' perceptions is important but largely ignored in the contemporary literature on market uncertainty.

This paper aims at making two contributions to this literature. First, this paper addresses the issue of connecting specific features of the environment with structural changes at the organizational level. Specifically, in this paper I examine one outcome—organization decision-making—and one particular environmental pressure—market competition. Second, I measure competitiveness of the market using organization members' perceptions, an important but largely ignored factor in the contemporary literature on market uncertainty. To do this, I use the 1997 National Organizations Survey and explore how contingency theory can be applied to the environmental uncertainty and market competitiveness literatures to better understand how

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perceptions of market competitiveness impact organizational structures. The importance of testing our theoretical assumptions with empirical data in this way cannot be overstated. Research that does so goes a long way towards a fuller, more robust understanding of the organization-environment link important to much of contemporary organizational sociology.

LITERATURE REVIEW

While it has been replaced as a leading theoretical framework within contemporary organizational sociology, contingency theory speaks to the direct connection between the organization and its environment. Early proponents of this theory argued that because the “organization’s market and technological environments have a major impact on organization design [...] organization’s internal structural arrangement is contingent on the demands of the external environment” (Simonetti and Boseman 1975). Or as described by Richard Scott, contingency theory contends that for organizations, “the best way to organize depends on the nature of the environment to which the organization must relate” (1981). Essentially, contingency theory differentiated itself from earlier theories of management because it did away with the notion that there was a single best way to structure an organization and instead placed emphasis on the way organizations must *actively* adapt to specific environmental criteria (Donaldson 1999:52). This theory aligns itself especially well with other environment-centered theories (like organizational ecology) and research that looks at how decoupling between organizations and their environment leads to higher mortality rates over time (e.g., Barron, West, and Hannan 1994; Ranger-Moore 1997). In these theories, fit with the environment is essential for organizational success. When functioning properly, organizations adapt, and when they do their structures align with the requirements set by their environment.

Contingency Theory: A Review

The crux of contingency theory¹ is the claim that there is no *one size fits all* when it comes to organizational structure. Instead, each organization, or organizational segment (Laurence and Lorsch 1967), is unique in its needs and environment; the organization's success is *contingent* on its ability to successfully meet those needs. Organizational structure, loosely defined as any "recurrent set of relationships between organization members²," enables the organization to adapt to the environment in the way that best suits the organization's goals (Donaldson 1999:51). Organizational characteristics like size (Blau 1970; Child 1973), main technology (Woodward 1965), environmental and market factors (e.g., uncertainty, competition), and organizational strategy (Chandler 1962) will determine the optimal structure for the organization. Because these characteristics affect the organization concurrently, organizational success is wholly dependent on organizational design. Unlike institutional explanations, where organizations homogeneously follow predetermined scripts (Meyer and Rowan 1977; DiMaggio and Powell 1983), there is an implicit assumption in contingency theory that organizations are actively engaged with their environment. Research has shown that organizations do this in a number of different ways, all of which follow a central premise: when faced with low levels of uncertainty organizations will centralize, while high levels of uncertainty lead to decentralization (Burns and Stalker 1961; Woodward 1965).

Burns and Stalker's classification of organizational structure as either mechanistic or organic was the first to make this argument explicit (1961:119-122). They contend that for

¹ Contingency theory is often referred to as "structural contingency theory" in the literature because the central focus is on how organizational *structure* is contingent on outside forces.

² Also defined in the discipline as "any purposeful arrangement of social activity that implies active control over human relations ordered for particular ends" (Ritzer 2007).

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organizations in stable environments, with low rates of change, a mechanistic (centralized and hierarchical) structure is optimal. While in highly uncertain environments, where change is common, an organic (flattened and decentralized) structure is better at innovating and quickly adapting to change. The costs of adopting the complexity and rigidity associated with a decentralized structural arrangement are outweighed by greater stability and predictability (Donaldson 1999:53). The argument is not necessarily that organizations always adapt to the environment in these ways, but that the most successful organizations do. The degree of centralization or decentralization is determined by contingency factors—like size, environment, or strategy—and is different for every organization (Donaldson 2001:38).

Woodward's (1965) formulation of contingency theory starts with this premise but added that the organization's technology is an important predictor of organizational structure (Donaldson 1999:53). For her, organic structures were associated with simple technology (i.e., craft goods) while advanced technology (i.e., mass production) is more mechanistic and centralized. Mass production, for example, is more predictable, and so a centralized structure is more appropriate. Interestingly, Woodward also found that as technology advanced even further, "the progressively greater predictability of the technical system and the smoothness of production [...] led first to more mechanistic and then to more organic structures" (Donaldson 1999:53). Woodward's research employed "qualitative measures of organizational structure (Donaldson 1999:54)" which differentiated itself from Burns and Stalker's "qualitative and anthropological (Donaldson 2001:38)" methods. Both methods would be employed in later contingency research, though as we will see, mainly in different literatures.

Finally, Paul Lawrence and Jay Lorsch extended the theoretical framework to the interorganizational level by contending that differentiation within firms is the result of

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uncertainty in the technical environment (1967). Each of the three “subsystems” the authors studied (sales, research, and production) faced very different technical environments resulting in differentiation in “formal structures, the member’s goal orientation, member’s time orientations and member’s interpersonal orientations” (1967:1). In turn, this differentiation affected the locus of control within that subsystem. Sales and production, for example, “where the subenvironment was more certain,” maintained centralized hierarchical structures (40). Research and Development (R&D), however, required a more decentralized structure to deal with rapid changes in the market (18). The authors argue that this differentiation is positive for organizations; those with higher levels of differentiation will be more successful (46).

Early contingency theorists saw decentralization in highly uncertain environments (and centralization in stable environments) as the most efficient and effective design for organizations. Later studies agreed, focusing largely on how subjective uncertainty affects organizational structure. Hage (1965) argued that while efficiency favors centralized decision-making and formalized structures, innovation favors organizations that are decentralized and informal. Consequently, in highly uncertain environments organizations favor structures that encourage innovation, while organizations in stable environments favor structures that increase control and efficiency (Donaldson 2001:39; see also Hage and Aiken 1967, 1969). Perrow (1967) distinguished between organizations whose technology is routine (low uncertainty) and nonroutine (high uncertainty) and contended that nonroutine technologies foster decentralized structures (1967:199-200). Others interested in the effect of organizational characteristics, like size, on organizational structure have found similar trends. Blau (1970), for example, established that increasing size leads to differentiation (decentralization) in organizations. In essence, larger organizations are more divided into sub-units, hierarchical levels, etc. than are smaller

organizations (204). Likewise, Child (1973) asserted that large organizations are “more specialized, have more rules, more documentation, more extended hierarchies, and a greater decentralization of decision making further down such hierarchies” (171). These studies further extended the empirical reach of contingency theory and advanced it as an explanation of how the environment affects organizational structure.

Environmental Uncertainty and Organizational Structure

While it is true that contingency theory often focuses on environmental uncertainty and its relationship with organizational structure, there is an independent literature on uncertainty to draw from as well. Environmental uncertainty has meant different things to different researchers. In much of the literature, environmental uncertainty is left broadly defined in such a way that “it is all too easy to assume that one knows what he or she is talking about” without any actual clarity in how the term is being used (Downey and Slocum 1975:562). Understanding uncertainty as perceptions of the environment, however, was common in the very earliest studies (e.g., Burns and Stalker 1961) and has continued to be used since. Scholars who have attempted to clarify this concept have done so by parsing out the various meanings researchers have given.

For example, Milliken argued that upon careful examination three definitions of uncertainty emerge: (1) “an inability to assign probabilities as to the likelihood of future events,” (2) “a lack of information about cause-effect relationships,” and (3) “an inability to predict accurately what the outcome of a decision might be” (1987:134). Further, Milliken explains that the major differences between researchers who conceptualize environmental uncertainty as perception and those who see it as an objective “property of organizational environments” lies in their interpretation of uncertainty (134-135). In essence, while one camp argues that simplifying

environmental uncertainty to psychological processes ignores the very real—objective—effect of the environment, the other argues that because perceptions are directly translated into action, researchers should focus their efforts on understanding perception. While throughout the literature there exists a strong distinction between the internal and external environment (see Downey and Slocum 1975), in this paper environmental uncertainty refers to the organization's external environment unless otherwise noted.

Most empirical work within this area has tracked well with the expectations of contingency theory and has suggested that greater uncertainty is associated with increased future planning (Tung 1979), technology change (Huber, O'Connell, and Cummings 1975; Gordon and Narayanan 1984), and higher levels of innovation (Freel 2005). All of these studies follow the familiar axiom from the contingency theory literature: that with uncertainty comes decentralization in one form or another. For example, Tung (1979:691) found that organizations that perceived greater uncertainty in their environment had increased levels of future planning. Gordon and Narayanan (1984) found that as environmental uncertainty increases, key decision makers turn to local sources of knowledge and use outside information to better inform their decision-making. Huber, O'Connell, and Cummings (1975) argued that the level of control in the organization conflates the relationship between environmental uncertainty and the specificity of information used by decision-makers. Among loosely structured organizations, information specificity is positively associated with uncertainty, while the opposite is true for tightly controlled organizations (736). Finally, Freel (2005) found that uncertainty in terms of "high volatility in the customer base" seems to be associated with higher levels of innovation (which has often been seen as a byproduct of a decentralized system).

Market Uncertainty and Organizational Decision-Making

While environmental uncertainty is a popular topic of discussion amongst organizational scholars, understanding the relationship between the market and organizational outcomes is equally important. Implicit in much of the environmental uncertainty literature is that the market is a central part of the organization's external environment (though not necessarily one and the same). For example, while Duncan (1972) includes customers, suppliers, and competitors alongside the socio-political and technology components in his conception of environmental uncertainty, he does not talk about the "market" explicitly. Analyzing market uncertainty on its own, distinct from other components of the environment, is essential to really understanding how organizations act in response to various types of environmental pressures.

Researchers have measured market uncertainty in a number of ways, though most have focused on measures that ignore perceptions of the environment. Guadalupe and Wulf take this approach when they use state- and industry-level measures like trade costs and degree of import penetration in their analysis (2009:16). Likewise, Bloom, Sadun, and Reenen use counts of direct competitors, the Lerner Index (which describes a firm's market power), and degree of import penetration to describe market uncertainty's association with decentralization (2010:6-7). Even the early work in contingency theory that focused on market uncertainty used measures like price competition, product alternatives, and delivery speed to isolate firms in competitive versus uncompetitive markets (Simonetti and Boseman 1975). While worthwhile measures of market competition, these types of macro-level measures do not parallel those used by sociologists in the environmental uncertainty literature.

When measured using the objective, macro-level measures mentioned previously, empirical research overwhelmingly supports contingency theory's assumption that high levels of

competition in a market lead to decentralization. Simonetti and Boseman (1975) used Mexican and Italian firms to support the crux of contingency theory; market uncertainty, they found, is associated with decentralization of authority. They found that firms in low-uncertainty markets who had centralized structures were more effective and that decentralized firms were the most effective regardless of market forces. Guadalupe and Wulf used industry-level measures of market competitiveness to argue that increased competition “flattens” organizations (2009). By this they mean that within organizations that saw changes towards greater market competition also had “broader spans of control” and were more decentralized than other firms (2009:31). Bloom et al. conducted a cross-national study and found that market competition “foster[s] greater decentralization” (2010). According to the authors, every measure of market competition showed a “very strong and robust relationship between competition and greater levels of decentralization” even when organization- and nation-level controls were added (7). While still a rather sparse literature, there is good reason to believe that market uncertainty is associated not only with decentralized organizational structures generally, but more specifically with decentralized decision-making.

Main Hypotheses

We know that “if men define situations as real, they are real in their consequences” (Thomas and Thomas 1928). And as such, the individual’s perceptions of the market should have a direct effect on organizational structure. Like many sociologists studying environmental uncertainty, I draw from Milliken (1987) and Duncan (1972) and use individuals’ *perceptions* of the environment. What makes this paper unique, however, is that like many in management and economics, I do so in relation to *market uncertainty*. Though unlike those scholars, I use

perceptions of market uncertainty as my independent variable, as opposed to the “objective” measures common in those literatures. This allows me to apply the key expectations from the environmental uncertainty literature to the case of market competitiveness. Furthermore, because the market has been understudied among sociologists using subjective measures, leaving much about the effect of perceived market competitiveness unknown. The primary contribution of this paper is combining these two literatures to address this issue.

The contingency theory and environmental uncertainty literatures suggest that high levels of uncertainty, whether perceived or in actuality, are associated with decentralized organizational structures. Subsequently, I expect high levels of competition to be associated with decentralization of decision-making. Accordingly, I expect that:

Hypothesis 1: Organizations who operate in highly competitive markets (and high levels of uncertainty) will tend to have a higher degree of decentralization.

Additionally, Laurence and Lorsch’s (1967) work within the contingency theory literature suggests that different units within organizations react differently to the same environmental pressures. Decisions about production, for example, will be affected differently by market competitiveness than those concerning labor. Because production is an ongoing process—tightly coupled to the organization’s operation—it follows that outside pressures will have less of an impact on production-related decisions than on labor-related ones. Production-related decisions, consequently, are more likely to be insulated from outside influence than are other types of decisions. As a result, I expect that:

Hypothesis 2: Decisions related to labor will have a greater association with decentralization in highly competitive markets than will production-related decisions.

Examining whether these hypotheses hold when using self-reported measures of perceived market competitiveness is the next step in the analysis. If perception does, in fact, matter, then I

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should see significant associations between the measures of perceived competitiveness and degree of centralization in organizational decision-making.

DATA AND METHODS

The 1997 wave of the *National Organizational Study* (NOS) was collected between June 1996 and June 1997 by researchers at the University of Minnesota, Center for Survey Research (Kalleberg, Knoke, and Marsden 2001). This wave followed up on the original National Organizational Study in 1991, which garnered its sample from respondents of the 1991 General Social Survey (Kalleberg, Knoke, Marsden, and Spaet 1993). The sampling frame for the second wave, however, was derived from the *Dun and Bradstreet Information Services*, which provided a massive set of US organizations stratified by organization size (number of employees) from which to draw a sample (for more on the sampling frame see Kalleberg et al. 1990). This survey is unique because it includes a number of interesting questions that speak to organization members' perceptions of uncertainty as well as the organizations' decision-making processes. This allows for analysis that speaks to how perceptions of the market affect organizational decision-making and various other structural processes.

From an initial sampling frame of over 15 million "work organizations" in the United States, 1,835 were chosen to participate in the study based on a stratified random sample, of which 1,002 organizations completed surveys (Kalleberg, Knoke, and Marsden 2001). For each organization, a "key decision maker" was asked to complete the survey. Business owner, human resources or other director, and other staff member comprised 30.54, 43.21, and 20.16 percent of respondents respectively across the initial sample. The survey instrument was either completed during phone interviews or mailed to the organizations and returned to the researchers.

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According to the data codebook, it took an average of nine separate contact attempts to complete each survey, with 80.04 percent of surveys completed by a single respondent. Approximately 54 percent of organizations completed surveys, most by phone interview (Kalleberg, Knoke, and Marsden 2001).

Dependent Variables

Six questions in the 1997 National Organizations Survey (NOS), each asking at what vertical level in the organization a particular decision was typically made, were used as dependent variables in the linear regression models. These six variables were split into two main groups: production-related decisions (quality, schedules, and targets) and employee-related decisions (hiring, evaluation, and training). In NOS, respondents were asked to answer “who actually makes the final decision in each area” for each of the decisions listed. For analysis, the variables were reverse coded so that the highest administrative level, “someone at larger organization” (for subsidiaries), is coded as 5, followed by “head of organization” (4), “middle manager” (3), “supervisor” (2), and “somebody below [supervisor]” (1). In effect, this variable was treated as a measure of degree of centralization. For the OLS models, this means that each point in the response item corresponds to the hierarchical decision-making level for that particular decision. A positive coefficient in the analysis refers to a higher level of decision-making authority (a more centralized structure) and a negative coefficient means that decisions are typically made at lower levels of the organization (more decentralized). A 1968 study interested in measuring organizational structure used a number of similar questions to gauge the level of centralization in the organization (Pugh et al. 1968:102-104; for more on measuring organizational structure see Pennings 1973). While that study originally incorporated 23 separate

variables into a single scale, given what is available in NOS my analysis uses a much simpler set of six questions. For the measure, the average level of decision-making for most decision types hovered around “middle manager,” a score of 3.0 (a standard deviation around 0.70) (Table 1).

Independent Variables and Controls

Of interest in this analysis is how organizational members perceive uncertainty as a product of “unpredictable change,” often considered a subset of environmental change more generally (Milliken 1987:135). The variables I used speak to these issues of definition by taking into account “state” uncertainty—when the state of the environment is uncertain, though not necessarily the actions the organization makes itself. This conceptualization parallels Milliken’s (and others’) argument well. The primary independent variable in the analysis, *market competitiveness*, asked “how much competition would you say there is in your main market or service area,” with four possible values ranging from *none* (1) to *a great deal* (4). Most organizations in the sample experienced some level of market competition: the average reported level was 3.037 (a standard deviation of 0.896) (Table 1). While others who have used this dataset have combined two variables, Market Competition and Foreign Market Competition, into a single scale³ (see Song 2002), this analysis uses only the former variable. Remember that recent analyses of market uncertainty have focused exclusively on objective measures like the number of direct competitors, degree of import penetration (Bloom, Sadun, and Reenen 2010), industry-level market data, or “quasi-natural” experiments where a period of market liberalization is assumed to have increased competition and uncertainty (Guadalupe and Wulf

³ A standardized scale combining these two variables has an alpha coefficient of 0.4911 and an interitem correlation of 0.3255. This is much too small a coefficient to justify combining the two variables for my analysis.

2009). While objective measures are useful, they do not necessarily speak to the direct environmental pressures organizations face—not to mention how organization members perceive those uncertainties.

In addition to the principal independent variable already mentioned, this paper uses a total of eleven control variables. The first two continuous variables control for the effect of organizational characteristics on organizational structure. First, an index was created to measure the degree of bureaucratization in the organization using five yes or no questions asking whether the organization had particular written documents (this variable was taken from Song 2002). For this variable, the mean score was 2.36 and the standard deviation was 1.68 (Table 1). Second, a variable measuring the number of administrative levels in the organization, ranging from *zero* to *twenty*, acts as a measure of vertical distance between the highest and lowest level in the organizational hierarchy. The mean score was 2.43 and the standard deviation was 2.09 (Table 1). The next two controls come from the organizational ecology literature. First, a measure of organizational age is included in the model. To do this, I subtracted the organization's founding year from the year the study was conducted, 1996. The mean for this variable was 39.45 years with a standard deviation of 37.84 years. In the model, the natural log was used. Second, a variable measuring the logged total number of employees, including both full-time and part-time employees, is used as a proxy for organizational size and capacity. Before I took the natural log of the variable, the mean number of employees was 3474.58 and the standard deviation was 15721.58 employees.

The next three control variables account for interorganizational influence on structure. First, a measure of organizational control, which asked whether the organization being surveyed is part of another, larger organization (*subsidiary*=1), was included. The second and third

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variables asked whether the organization works closely with suppliers (*suppliers*=1) and customers (*customers*=1) respectively. In both cases, “agree” and “strongly agree” were recoded as 1 and “disagree” and “strongly disagree” were recoded as 0 to create the binary. These two variables control for influence of the organization’s activities by these two highly salient audiences. Additionally, two controls were included to account for heterogeneity within fields. First, a binary variable measuring for profit status (*forprofit*=1) is used to distinguish between organizations in different sectors. Second, a binary was included measuring whether the organization was a manufacturing firm (*manufacturing*=1). Finally, to account for variation between respondents, measures of gender (*female*=1) and respondent title (*owner*=1) were included in the models. The later variable was constructed by combining director, human resources director, staff member, or other employee versus business owner.

ANALYSIS

This analysis uses ordinary least-squares (OLS) regressions because treating the dependent variable as continuous allows me to effectively compare the significance and magnitude of my measures. This analysis assumed that there is a normal, linear relationship between level of organizational decision-making (degree of centralization) and my independent variables. OLS regression is the preferred method for explaining this type of general relationship. To do this, I use the Stata 13 software package and `spost 13` commands to estimate models with robust standard errors and test for significance. All reported results use two-tailed tests. Because all cases with missing data relevant to my analysis were removed from the dataset using listwise deletion, my final sample size was 562 organizations. This sample represents all ten industry categories (from the Standard Industrial Classification), though predictably most come from the

two largest sectors: service and manufacturing. Just over 68 percent of organizations in the sample are independent, while the other roughly 32 percent included subsidiaries, franchises, or local affiliates of larger organizations (Kalleberg, Knoke, and Marsden 2001).

See Table 1 on page 27

The effect of perceived market competition on the degree of centralization within the organization was tested against five other possible alternative arguments. Along with my primary variable—perceived market competition—eleven other variables representative of each alternative were included in the models. Table 2 shows the full models across all six decision types. After including the control variables, perceived market competition remained significantly associated with decentralization across four of the six decisions (Table 2)⁴. A one-unit increase in perceived market competition is associated with a 0.155-point decrease in the centralization measure for decisions pertaining to production quality ($p < 0.01$), a 0.092-point decrease for production targets ($p < 0.05$), a 0.120-point decrease for employee hiring ($p < 0.01$), and a 0.109-point decrease for employee training ($p < 0.01$) (Table 2)⁵.

Of the two organizational characteristic variables, level of bureaucratization had the biggest association with decentralization (Table 2). That measure is associated with decentralized production schedules ($\beta = -0.077$; $p < 0.001$), production targets ($\beta = -0.060$; $p < 0.05$), and employee evaluation ($\beta = -0.047$; $p < 0.05$), but not the other three decisions. The number of administrative

⁴ While adj. R-squared and BIC scores are both included in Table 1, adj. R-squared was used as the primary method for choosing models and determining model fit.

⁵ Sensitivity analysis using Seemingly Unrelated Regression (SUR) showed no substantive differences than in these OLS models.

levels is also associated with decentralization, though for production targets ($\beta=-0.060$; $p<0.01$) and employee training ($\beta=-0.046$; $p<0.05$) only. The two respondent characteristic measures intended to control for differences in how people in different social positions perceive organizational structure (Table 2). Interestingly, respondents job had the greatest effect, especially for production schedules ($\beta=-0.213$; $p<0.05$), employee evaluation ($\beta=-0.225$; $p<0.01$), and employee training ($\beta=-0.272$; $p<0.01$). In effect, owners are more likely to think that these three decisions are being made at higher levels in the organizational hierarchy (irrespective of where the decisions are actually made). Dissimilarly, female respondents tend to think that decisions about employee hiring are made lower in the organizational hierarchy than do their male counterparts ($\beta=-0.233$; $p<0.001$).

The three resource dependency measures have mixed empirical results (Table 2). For those organizations that are subsidiaries of another, larger, organization, decision-making structures tend to be more centralized. This is the case for production schedules ($\beta=0.196$; $p<0.01$), production targets ($\beta=0.192$; $p<0.05$), employee evaluation ($\beta=0.152$; $p<0.05$), and employee training ($\beta=0.254$; $p<0.001$). Working closely with suppliers or customers, however, has the opposite effect. Working closely with suppliers is associated with decentralized decision-making for production quality ($\beta=-0.331$; $p<0.05$), and working closely with customers is associated with decentralization for production quality ($\beta=-0.221$; $p<0.05$) and employee evaluation ($\beta=-0.140$; $p<0.05$). The two neoinstitutionalism measures also offer mixed results. For profit status is associated with more centralized decision-making for production quality ($\beta=0.37$; $p<0.01$) and employee training ($\beta=0.259$; $p<0.01$). Being a manufacturing firm, however, is associated with decentralization concerning employee hiring ($\beta=-0.185$; $p<0.05$) and employee evaluation ($\beta=-0.219$; $p<0.01$).

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The organizational ecology measures play a large role in labor related decisions and are associated with decentralization across the board (Table 2). Organization age is associated with a decentralized structure concerning production schedules ($\beta=-0.072$; $p<0.05$), employee hiring ($\beta=-0.084$; $p<0.05$), employee evaluation ($\beta=-0.126$; $p<0.001$), and employee training ($\beta=-0.084$; $p<0.05$). Likewise, total number of employees is associated with decentralized decision-making for production schedules ($\beta=-0.101$; $p<0.001$), employee hiring ($\beta=-0.100$; $p<0.001$), employee evaluation ($\beta=-0.120$; $p<0.001$), and employee training ($\beta=-0.040$; $p<0.05$). These two variables also seem to play a more coercive role on organizational structure/degree of centralization than perceived market competition.

See Table 2 on page 28

The relationship between perceived market competition and decision-making authority does not exist for decisions pertaining to production schedules and employee evaluation; further analysis shows that ecological factors play a much more important role for these two decisions. In both cases, adding each set of variables sequentially shows that, when added, the two “organizational ecology” variables eliminate the significant effect of perceived market competition on degree of centralization (Tables 3 and 4). In the case of production schedules, organizational age is associated with decentralization ($\beta=-0.072$; $p<0.05$) as is total number of employees ($\beta=-0.101$; $p<0.001$). Likewise, for employee evaluation organizational age is associated with decentralization ($\beta=-0.126$; $p<0.001$) as is number of employees ($\beta=-0.120$; $p<0.001$). In each case the adj. R increases even after including the new set of variables,

suggesting that the model including them is preferred (the adj. R-squared is 0.243 and 0.338 respectively).

See Table 3 on page 29

See Table 4 on page 30

The second hypothesis, that labor-related decisions will be affected more by perceived market competition than will production-related decisions, is only somewhat supported by the analysis. First, the coefficients for production-related decisions are smaller than those for labor-related ones. This suggests that the relationship between perceived competition and degree of centralization is weaker for production-related decisions than those concerning labor. Secondly, model fit for labor-related decisions is better than for production-related decisions. This too suggests that labor-related decisions are better associated with perceived market competition than those concerning production. Still, there is no compelling evidence that the differences in coefficients between production- and labor-related decisions are significant.

DISCUSSION AND CONCLUSION

Organizations that perceive high levels of uncertainty in their environment tend to have more decentralized, or localized, decision-making hierarchies compared to those who perceive their environment as being relatively stable and uncompetitive. The association between uncertainty and degree of centralization is robust enough that it remains significant for the majority of decisions despite including controls for the major theoretical alternatives present in the literature. Additional examination of the data suggests that the second hypothesis is partially

supported, as the coefficients and adj. R-squared for the three production-related decisions are smaller than for the three labor-related ones. This suggests a stronger relationship between perceived market completion and degree of centralization in the case of labor-related decisions. Understanding degree of centralization as an outcome of market uncertainty is an important aspect of organizational life that is still largely unexplored in the literature. And while a number of researchers have worked to define, operationalize, and measure this relationship, clearly there is still much to be done. These results point to some interesting possibilities for organizational sociologists going forward.

The relationship between an organization's structure and its environment is a complicated one. Economists and management scholars who study this relationship have tended to focus on the role of the market and its objective features. Trade liberalization, counts of direct competitors, degree of import penetration, and the like have all stood in for measures of competition within this literature. Sociologists, however, have sometimes used subjective measures of uncertainty to study the broader "social environment" organizations face. These subjective—often self-reported—measures take into account how the individual views their environment, a fundamentally social process. Despite their obvious similarities, methodological differences have left these literatures largely disjointed. This paper has attempted to bridge this divide by examining the relationship between perceived market competition and organization decision-making using contingency theory as a framework and focusing on the centrality of subjective measures of uncertainty. Taking from the sociological literature on environmental uncertainty and then applying it to the case of market competition goes a long way toward bridging the gaps among sociological, managerial, and economic scholarship.

Moreover, within sociology, various theoretical paradigms have competed to define the nature of this relationship. Where contemporary organizational sociology has focused its efforts on describing the effect of isomorphic forces, it has ignored how the organization must respond directly to the constraints imposed by its environment. Other paradigms focusing on the distribution of resources or the ecological processes affecting whole organizational populations have been replaced by a new focus on institutional norms and cultural logics. This cultural move has meant a shift in how we think about organizations, decoupling structures from their fundamental causes. This new paradigm necessarily minimizes the role of the individual. For the organizational sociologist interested in the role of the environment in shaping organization's structure and strategy, this should be worrisome. Accordingly, there is good reason to question research on market competition—and environmental uncertainty more generally—which does not account for individuals' perceptions. In the end, it is clear that people still matter in the structuring of organizations. The main contribution of this paper to the literature is to offer some new evidence supporting a recoupling of the individual with the organization, and by doing so better understand the dynamics of organizational behavior.

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Tables and Figures

Table 1: Descriptive Statistics (N=562)

Variable Description	Mean	Std. Dev.	Min.	Max.
<i>Dependent Variables</i>				
Production Quality	2.959	1.086	1	5
Production Schedule	2.839	0.845	1	5
Production Targets	3.117	0.863	1	5
Employee Hiring	3.110	0.879	1	5
Employee Evaluation	2.826	0.858	1	5
Employee Training	3.370	0.846	1	5
<i>Independent Variable</i>				
Market Competition	3.365	0.857	1	4
<i>Control Variables</i>				
Bureaucratization Index	3.256	1.680	0	5
Administrative Levels	2.432	2.089	0	20
Log of Organizational Age	3.210	1.038	0	5.460
Log of Total Employees	4.527	2.522	0	11.502
Respondent is Female	0.482	-	0	1
Respondent is Owner	0.342	-	0	1
Organization is Subsidiary	0.295	-	0	1
Organization works with Suppliers	0.923	-	0	1
Organization works with Customers	0.746	-	0	1
Organization is For Profit	0.779	-	0	1
Organization is Manufacturing Firm	0.187	-	0	1

Source: 1997 National Organizations Survey (ICPSR 03190)

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Table 2: OLS Regression of Perceived Level of Competition and Level of D-M by Decision Type

	Production Related Decisions			Employee Related Decisions		
	Quality	Schedules	Targets	Hiring	Evaluation	Training
<i>Contingency Theory</i>						
Competition in Market	-0.155** (0.056)	-0.072 (0.040)	-0.092* (0.044)	-0.120** (0.042)	-0.064 (0.038)	-0.109** (0.042)
<i>Organizational Characteristics</i>						
Level of Bureaucratization	-0.046 (0.032)	-0.077*** (0.023)	-0.060* (0.025)	-0.009 (0.024)	-0.047* (0.022)	-0.020 (0.024)
Number of Admin Levels	-0.041 (0.025)	0.017 (0.018)	-0.060** (0.019)	-0.036 (0.018)	0.014 (0.017)	-0.046* (0.018)
<i>Respondent Characteristics</i>						
Survey Resp was Female	-0.030 (0.091)	-0.042 (0.065)	-0.041 (0.072)	-0.233*** (0.068)	-0.092 (0.062)	-0.037 (0.068)
Survey Resp was Owner	0.133 (0.116)	0.213* (0.083)	0.098 (0.092)	0.122 (0.086)	0.225** (0.079)	0.272** (0.087)
<i>Resource Dependency Theory</i>						
Organization is a Subsidiary	0.163 (0.102)	0.196** (0.073)	0.192* (0.081)	0.102 (0.076)	0.152* (0.069)	0.254*** (0.076)
Works with Suppliers	-0.331* (0.168)	-0.097 (0.121)	-0.116 (0.133)	-0.004 (0.125)	0.042 (0.114)	0.057 (0.126)
Works with Customers	-0.221* (0.103)	-0.027 (0.074)	-0.083 (0.081)	-0.123 (0.076)	-0.140* (0.070)	-0.126 (0.077)
<i>Neo/Institutional Theories</i>						
For Profit Status	0.372** (0.129)	-0.071 (0.093)	0.129 (0.102)	-0.044 (0.096)	-0.060 (0.088)	0.259** (0.097)
Manufacturing Firm	-0.224 (0.121)	-0.128 (0.087)	-0.053 (0.096)	-0.185* (0.090)	-0.219** (0.083)	-0.117 (0.091)
<i>Organizational Ecology</i>						
Organization Age	-0.058 (0.048)	-0.072* (0.034)	-0.070 (0.038)	-0.084* (0.036)	-0.126*** (0.033)	-0.084* (0.036)
Total Number of Employees	-0.034 (0.025)	-0.101*** (0.018)	-0.030 (0.020)	-0.100*** (0.019)	-0.120*** (0.017)	-0.040* (0.019)
_cons	4.211*** (0.326)	4.053*** (0.234)	4.137*** (0.257)	4.557*** (0.242)	4.185*** (0.222)	4.099*** (0.244)
N	562	562	562	562	562	562
adj. R ²	0.109	0.243	0.120	0.248	0.338	0.178
BIC	-1865.835	-2239.807	-2131.429	-2199.483	-2298.580	-2192.342

Standard errors in parentheses

Source: 1997 National Organizations Survey (ICPSR 03190)

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

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Table 3: OLS Regression of Perceived Level of Competition in Market for Production Schedule

	1	2	3	4	5	6
Competition in Market	-0.105* (0.041)	-0.115** (0.039)	-0.106** (0.038)	-0.103** (0.038)	-0.104* (0.042)	-0.072 (0.040)
Level of Bureaucratization		-0.143*** (0.022)	-0.107*** (0.022)	-0.117*** (0.022)	-0.111*** (0.023)	-0.077*** (0.023)
Number of Admin Levels		-0.039* (0.017)	-0.013 (0.017)	-0.020 (0.017)	-0.020 (0.017)	0.017 (0.018)
Survey Resp was Female			0.021 (0.068)	0.014 (0.068)	-0.008 (0.068)	-0.042 (0.065)
Survey Resp was Owner			0.462*** (0.079)	0.457*** (0.079)	0.411*** (0.080)	0.213* (0.083)
Organization is a Subsidiary				0.188* (0.076)	0.184* (0.075)	0.196** (0.073)
Works with Suppliers				-0.075 (0.125)	-0.072 (0.125)	-0.097 (0.121)
Works with Customers				-0.080 (0.076)	-0.063 (0.076)	-0.027 (0.074)
For Profit Status					0.062 (0.092)	-0.071 (0.093)
Manufacturing Firm					-0.254** (0.088)	-0.128 (0.087)
Organization Age						-0.072* (0.034)
Total Number of Employees						-0.101*** (0.018)
_cons	3.185*** (0.144)	3.776*** (0.153)	3.402*** (0.167)	3.517*** (0.203)	3.512*** (0.202)	4.053*** (0.234)
N	562	562	562	562	562	562
adj. R ²	0.010	0.116	0.167	0.174	0.183	0.243

Standard errors in parentheses

Source: 1997 National Organizations Survey (ICPSR 03190)

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

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Table 4: OLS Regression of Perceived Level of Competition in Market for Employee Evaluation

	1	2	3	4	5	6
Competition in Market	-0.098* (0.042)	-0.106** (0.040)	-0.096* (0.038)	-0.094* (0.038)	-0.101* (0.041)	-0.064 (0.038)
Level of Bureaucratization		-0.139*** (0.022)	-0.096*** (0.022)	-0.100*** (0.022)	-0.089*** (0.022)	-0.047* (0.022)
Number of Admin Levels		-0.058*** (0.017)	-0.028 (0.017)	-0.032 (0.017)	-0.033 (0.017)	0.014 (0.017)
Survey Resp was Female			-0.011 (0.067)	-0.014 (0.067)	-0.048 (0.067)	-0.092 (0.062)
Survey Resp was Owner			0.549*** (0.078)	0.542*** (0.078)	0.470*** (0.079)	0.225** (0.079)
Organization is a Subsidiary				0.152* (0.075)	0.147* (0.074)	0.152* (0.069)
Works with Suppliers				0.087 (0.124)	0.086 (0.122)	0.042 (0.114)
Works with Customers				-0.210** (0.076)	-0.185* (0.075)	-0.140* (0.070)
For Profit Status					0.129 (0.091)	-0.060 (0.088)
Manufacturing Firm					-0.385*** (0.086)	-0.219** (0.083)
Organization Age						-0.126*** (0.033)
Total Number of Employees						-0.120*** (0.017)
_cons	3.154*** (0.146)	3.778*** (0.155)	3.347*** (0.165)	3.398*** (0.201)	3.386*** (0.198)	4.185*** (0.222)
N	562	562	562	562	562	562
adj. R ²	0.008	0.128	0.202	0.213	0.238	0.338

Standard errors in parentheses

Source: 1997 National Organizations Survey (ICPSR 03190)

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Young Adults with Suicidal Ideation

Identify the Young Adults with Serious Suicidal Ideation: A Population-Based Study

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Young Adults with Suicidal Ideation

ABSTRACT

In the United States, suicide is a severe public health problem, and it has brought many Americans lots of pain. Vast studies have been done on the risk factors of “suicide” and “suicidal behaviors.” However, relatively few studies are concerned over suicidal ideation, which refers to thoughts of ending one’s life. This study aims to find the potential risk factors correlated to suicidal ideation among young adults, by putting three main categories of risk factors (social-demographics, psychological and social-cultural) into consideration.

Binary logistic regression model is applied. Psychological, religious beliefs, socioeconomic status (e.g., employment status) and personal lifestyle factors (e.g., illicit drug use and alcohol abuse) are all found to highly correlate with suicidal ideation. Brief comparison with Chinese young adults is put forward for directing future research. At last, possible intervention strategies corresponding to the risk factors are given for reducing the incidence of suicide among young adults.

Young Adults with Suicidal Ideation

Identify the Young Adults Aged 18-25 with Suicidal Ideation: A Population-Based Study

INTRODUCTION

Official data for 2010 indicates for every 13.7 minutes, a person commits suicide. Suicide ranked 10th as a cause of death in U.S. and even third among young adults (McIntosh & Drapeau, 2013). It was estimated that 8.6 million people aged 18 or older had thought seriously about killing themselves seriously in 2010. Among them, young adults aged 18-25 who held much of the families' expectation and love were at higher risks of having suicidal ideation and suicidal attempts than those aged 26-49 and adults aged 50 or older (SAMHSA, 2009). Suicide by young adults absolutely would cause a great loss to their families and friends, leaving their beloved with terrible pain (Jiang, Perry, & Hesser, 2010). So, identifying those adults who have higher potential to commit suicide is very important.

In previous studies, much attention was paid on the analysis of risk factors leading to suicide attempts or suicide plans among young adults. However, there was relatively little research concerning the risk factors of suicidal ideation among young adults, which were based only on small samples or a few important factors to consider. What's more, factors identified in suicide attempts have been used less in explaining "thinking about suicide." So, this study attempts to fill this gap by examining the potential risk factors which play significant roles in the occurrence of suicidal ideation among young adults aged 18-25 by using a population-based sample.

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LITERATURE REVIEW

The term “suicide” is defined “as the act of intentionally ending of one’s own life” (Nock et al., 2008, p.134). A considerable number of surveys across the nations or even conducted internationally, has provided numerous data on suicide. The latest 2010 official final data report on suicide in the United States shows that 38,364 people killed themselves during that year, which means about 105 people died as a result of suicide per day (McIntosh & Drapeau, 2013). The report also reveals that fatal suicide ranks 10th in the cause of death in U.S. and even 3rd for young adults.

Once the suicide is done, the impact experienced by the survivors, that is, “family members and friends of a loved one who died by suicide” (McIntosh & Drapeau, 2013, p.1) is enormous. From the data report, an estimate of at least 6 people will be affected after each suicide. Another study shows that suicide impacts will not only affect the family members or their friends but the people who hear the news of the suicide (Gould, 2001).

There have been vast studies on identifying risk factors involved in suicide. Psychological factors had been found to convey the relatively high risk for suicide, including personality disorder, hopelessness, impulse control, psychological pain, and social isolation (Brown, Beck, Steer, & Grisham, 2000; Joiner Jr., Brown, & Wingate, 2005). Since finding that the behavior of suicide could be inherited from the former generation, many family and twin studies concluded that biological factors were also highly associated with suicide (Joiner Jr., Brown, & Wingate, 2005; Roy & Segal, 2001). Besides, other factors such as the previous exposure to suicide, homosexuality was proved to be a high risk for future suicide (Gould, 2001; Russell, 2003). Though many risk factors in different circumstances had been identified out, the exact mechanisms through which these factors trigger suicide aren’t fully understood (Nock et al., 2008).

Suicidal behavior, such as suicide plan and suicide attempt, is of considerable importance for researchers to understand the process of suicide. And there have been many works that studied the risk factors for suicidal behaviors. Risk factors including the demographic factor such as being female, being unmarried and being unemployed (Bertolote et al., 2005; Nock et al., 2008) and psychological factor like

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the severity of depression and hopelessness (Brown et al., 2000) were tested within a group of possible contributors in many empirical works whether they were associated with suicidal behaviors. Other factors such as genetic factors and homosexuality have been studied (Fergusson, Horwood, & Beautrais, 1999; McDaniel, Purcell, & D'Augelli, 2001). But due to the lack of enough studies to support the conclusion, the substantiation of factors like gene structures and homosexuality have not been confirmed as significant contributors. Besides, some studies, combining possible risk factors of suicide behaviors, provided general path models or theoretical models to explain the inner mechanism of suicide behaviors (Gutierrez, Rodriguez, & Garcia, 2001).

However, compared to the studies on suicide and suicide behaviors, suicidal ideation, which is regarded as the first stage of the process of suicide, has not been examined sufficiently by researchers. Among the existing literature on suicidal ideation, there are three main risk factors accounting for suicidal thoughts, which more or less overlap with risk factors of suicidal behaviors (Haller & Miles, 2003). And all these three main risk factors according to the place where they exert influence can be respectively divided into two large parts: internal risk factors and external risk factors (See Figure 1). The first main risk factor concerns personal aspect. Its internal risk factors include mental health, personality, sexual orientation and religious belief. For instance, mental risk factors, like major depressive disorder, panic disorder, alcohol abuse and illicit substance use were found correlated with suicide ideation (Brown et al., 2000). External risk factors in the personal aspect contain exposure to suicide, socioeconomic status, personal lifestyle, access to firearms and history of physical/sexual abuse. For example, Calder, McVean and Yang (2010) found that current suicidal ideation were all highly associated with physical or sexual abuse in childhood or adulthood. It had been suggested that thwarted belongingness, exposure to the suicidal behavior of relatives, and owning a firearm were all significantly correlated to suicidal ideation (Bearman & Moody, 2004).

The second risk factor concerns the family dimension. A heritable risk serves as an internal factor to exert impact on people. Its external risk factors include family history of suicide, parent-child relationship and parental marital status. For example, a family history of suicidal behavior or psychiatric disorders is

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considered to add risks of suicidal ideation among the succeeding generations (Brent & Mann, 2005).

Besides, low parental monitoring or bad parent-child relationships, often increase the incidence of suicidal ideation (King et al., 2001).

The third risk factor correlated with suicidal ideation is the social environment. This domain contains two factors: culture and media. The culture through which people are brought up instills expectations of individual freedom, social attachment and social identity in the population. These values, which are formed in the cultural environment, shape people's perspectives about suicide and, if not appropriately provided, can lead people to commit suicide. Eckersley and Dear (2002) found individualism like personal freedom and control were strongly correlated to suicide among male youth. They further argued that western societies' promotion of unrealistic expectations of individual freedom and autonomy caused youth suicide rate to increase. The impact of media on suicidal ideation cannot be ignored. Media on the one hand, disseminates specific programs promoting suicide contagion; on the other hand it serves as a positive role in informing people about the risk for suicide, and thus prevents potential people committing suicide (Gould, 2001).

But many works on suicidal ideation studied the risk factors only in single domain; while a few works analyzed the suicidal ideation by taking a set of factors into consideration. Less research (Dugas et al., 2012) is directed towards an examination of suicide ideation among the specific age groups like young adults who have a much higher potential to suicide ideation compared to older adults and adolescents. Dugas et al.(2012) found that from ninth grade and beyond, depression symptoms is a strong predictor of suicidal ideation in young adults, suggesting adding test of depression symptoms to the suicide intervention programs for better screening and sequential treatment. But this study, like most of the existing literature on this topic, was based on a small sample, though convenient. It is difficult to draw a generalization to the general population. This study, however, is based on a nationwide survey, in which young adults takes up almost one-third of the sampled population. Personal risk factors were discussed in this study, including mental health, religious belief, socioeconomic status and personal lifestyle.

The examination of suicidal behaviors, in the existing literature, has attempted to identify a complex

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set of factors. But as an important part of suicide domain, suicidal ideation has been relatively under-researched. Studying ideation in depth will surely assist an overall understanding of suicide.

This paper applies several logistic regression models and uses deviance analysis to choose the best suited model for depicting the relationship between suicidal ideation and personal risk factors among young adults. Odds Ratio is given to quantify the association above.

Figure 1: The Conceptual Framework of Risk Factors of Suicidal Ideation

Risks of Suicidal Ideation		
Personal risk factors	Internal risk factors	Mental health Personality Sexual orientation Religious belief
	External risk factors	Exposure to suicide Socioeconomic status Personal lifestyle Access to firearms History of physical/sexual abuse
Family risk factors	Internal risk factors	Gene
	External risk factors	Family history of suicide Parent-child relationship Parental marital discord
Social environmental factors	Internal risk factors	Culture
	External risk factors	Media

RESEARCH QUESTION

This paper mainly identifies specific personal risk factors (including mental health, religious belief, socioeconomic status and personal lifestyle) which contribute to cause suicidal thoughts among young adults aged 18-25 in the United States. Comparison of risk factors of suicidal ideation between young adults in U.S. and China is briefly discussed for directing future research.

METHODOLOGY

The data utilized in this study came from the National Survey on Drug Use and Health, 2011 (United States Department of Health and Human Services, 2013), which was the thirty-first in a series administered by the Substance Abuse and Mental Health Services Administration (SAMHSA). This survey provided

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information about alcohol, illicit drug and tobacco use and mental health among non-institutionalized U.S. civilian population aged 12 or older. A total of 58,597 cases are available for public use. Given that this study was to identify the characteristics of young adults aged 18 to 25 with suicidal ideation, the author selected cases which exactly satisfy the purpose, removing missing cases which were a very small proportion of whole cases and finally the data set contained 18,791 records. This survey conducted by Research Triangle Institute (RTI) since 1988, guaranteed the high reliability and validity of the survey's design. Besides, this survey was the only survey conducted in the whole nation asking about suicide, which can be used to analyze the suicidal ideation across the nation.

The 2011 NSDUH survey was selected using a multistage, deeply stratified sample design containing four major stratification stages. First, the fifty states and the District of Columbia were partitioned geographically into approximately equally sized regions based on a composite size measure, and a total of 900 state sampling regions (SSRs) were formed through the whole country. Second, small geographic areas composed of adjacent census blocks, which also called segments, were derived from the partition of SSRs. Third, the dwelling units within each segment was selected. Fourth, field interviewers (FIs) visited each sample address to list all eligible persons and then conduct their interviews.

MEASURES

Dependent Variable

The status whether seriously thought about killing self in the past twelve months was coded into two categories: YES (=1) and NO (=0). 81 missing cases¹ (0.4%) were removed from the dataset for the own purpose of this study.

Explanatory Variables

Based on the previous conceptual model, this study mainly discussed the personal factor's influence on suicidal thoughts among young adults. Explanatory variables were divided into two major parts: Internal risk factors (mental health and religious belief) and External risk factors (socioeconomic status and personal

¹ Of 81 missing cases, most of which were coded as "Don't Know" and "Refused".

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lifestyle). Mental health factors contained psychological distress and major depressive episode (MDE) variables. Religious belief factor was reflected by religious belief variable. Socioeconomic status factors included gender, race/ethnicity, education level, marital status and employment status variables while personal lifestyle factors consisted of overall health, alcohol abuse and illicit drug use variables.

A description of the operationalization of the independent variables are describes below.

Gender variable's category was the same with the origin data file, which was measured as "Male" or "Female." "Male" was the reference group.

Race/Ethnicity variable was recoded into 3 categories: Nonhispanic White, Nonhispanic Black and Others² instead of the former 7 categories. Nonhispanic White was the reference.

Education Level variable was recoded into three categories: "Less than High School," "High School," and "Any College." Respondents measured as "Any College" included freshmen, sophomore, or Junior, senior, or Graduate or Professional School.

Marital Status variable, for particular purpose, was coded by the author as "Never Been Married" and "Previously/Currently Married." Whether married or not is expected to have some influence on the risk of suicidal ideation.

Overall Health variable was coded into "Excellent," "Very good," "Good," "Fair," and "Poor" in the original public dataset. The author merged the responses into 3 main categories: "Excellent/Good," "Good," and "Fair/Poor" for analysis. "Excellent/Good" was the reference.

Employment Status variable referred to the respondents' employment status. Four categories were used, "Employed full time," "Employed part time," "Unemployed," and "Others (incl. not in labor force)." The group who were "employed full time" was the reference.

Alcohol Abuse variable was a dichotomous one showing whether the respondent abused alcohol in the past year. The definition of alcohol abuse was based on the criteria listed on the Diagnostic and Statistical

² Other racial and ethnic groups such as Asian and Pacific Islanders and Hispanics were joined to form others because this study was concerned about the Nonhispanic Black and Nonhispanic White Americans.

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Manual of Mental Disorders (DSM-IV), 4th edition (American Psychiatric Association [APA], 1994).

Illicit Drug Use variable was coded as 0 if the respondent reported he/she didn't use any illicit drug in the past year and coded as 1 if he/she really did in the last 12 months.

Religious Belief variable was derived from the reported attitude of respondents towards the question “my religious beliefs are very important.” 4 categories for this variable: “Strongly disagree,” “Disagree,” “Agree,” and “Strongly agree.” “Agree” was the reference.

MDE variable was dichotomously measured by certain criteria. A respondent was classified as having a major depressive episode (MDE) if he/she reported experiencing at least 5 out of 9 criteria used to define an adult as having had MDE, where at least one of the criteria was a depressed mood or loss of interest or pleasure in daily activities.

Psychological Distress variable was created from the variable “K6SCMAX” measured by the worst K6 total score in the past year. K6 score was ranging from 0 to 24 indicating the level of psychological distress. Psychological Distress variable was coded as Yes (=1) if $K6SCMAX \geq 13$ while the rest was coded as No (=0).

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Table 1: 12-Month Prevalence of Suicidal Ideation among Young Adults aged 18-25

Characteristics	Suicidal Ideation	
	No (Weighted %)	Yes (Weighted %)
Gender		
Female	8945(92.3)	765(7.7)
Male	8534(94.1)	547(5.9)
Education		
Less than high school	314 (95.6)	14(4.4)
High school	8761(92.3)	774(7.7)
Any college	8404(94.0)	524(6.0)
Marital Status		
Never been married	15060(93.1)	1160(6.9)
Previously/Currently married	2419(94.0)	152(6.0)
Employment		
Employed full time	6567(94.9)	397(5.1)
Employed part time	4634(92.5)	376(7.5)
Unemployed	2196(89.2)	257(10.8)
Other (incl. not in labor force)	4082(93.7)	282(6.3)
Race/Ethnicity		
Nonhispanic White	10381(93.4)	758(6.6)
Nonhispanic Black	2412(92.6)	192(7.4)
Others	4686(93.1)	362(6.9)
Health		
Excellent/Very good	12611(94.6)	740(5.4)
Good	3927(90.9)	420(9.1)
Fair/Poor	941(84.0)	152(16.0)
Any Illicit Drug Use		
Did not use in past year	11551(94.9)	637(5.1)
Used in past year	5928(90.1)	675(9.9)
Major Depressive Episode		
Yes	16420(65.1)	745(34.9)
No	1059(95.8)	567(4.2)
Alcohol Abuse		
No/Unknown (Otherwise)	16034(93.5)	1150(6.5)
Yes	1445(90.4)	162(9.6)
Psychological Distress		
Yes	2552(73.9)	877(26.1)
No	14927(97.3)	435(2.7)
Religiosity		
Strongly agree	4985(94.0)	342(6.0)
Agree	6651(94.5)	416(5.5)
Strongly disagree	2953(90.2)	323(9.8)
Disagree	2890(92.1)	231(7.9)

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MODEL AND PREDICTION

Considering that the response in this study is a binomial variable, it was natural to think about adopting the logistic regression model and the probit regression model. In addition to these two techniques, the author also chose two models by AIC in a Stepwise Algorithm derived from the logistic full model and the probit full model, respectively called “Logit.AIC” and “Probit.AIC,” which both had the minimal AIC in all set of logistic and probit models. Both Logit and Probit models don’t make any assumptions of normality, linearity and homogeneity of variance for independent variables, but the regression equation should have a linear relationship with the logit/probit form of the discrete dependent variable. In this case, the dependent variable is a binary one, and I assume that there is a linear relationship between the logit/probit forms of regression equation and respondent variable. Hence logit, probit models and their derivatives (only dropping some independent variables from the original logit or probit models) all satisfy the necessary assumptions.

The analysis of variance between Logit model and Logit.AIC model showed that Logit.AIC model though dropped two parameters through the stepwise regression and fitted the data almost as well as Logit model did (See Table 2). So, the author chose the Logit.AIC model for its simplicity. Then the author compared the last three models: Logit.AIC model, probit model, and Probit.AIC model. These three models showed no significant difference in deviance. This suggested that they almost had the same ability to explain the relationship between the regressors and the dependent variable (See Table 3). So, the author adopted the ROC curve³ (See Figure 2) to determine which model was better in binary classification. However, these three curves overlapped each other, showing no difference among them. Considering that the Logit.AIC model has better interpretation than the two probit models, the author finally chose Logit.AIC model for future prediction.

Since the classification model was used at a particular threshold, the author plotted the ROC curve of

³ ROC curve is a graphical plot which illustrates classification model’s performance on prediction, offering a tool to select the optimal model.

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Logit.AIC model again in order to find an optimal threshold value for prediction. In order to elevate the correct rate for predicting the true cases of suicidal ideation, we needed a properly large TPR^4 value. Even sacrificing the increase in FPR^5 to achieve that goal is necessary since it's more important in the real world to truly predict young adults with suicidal ideation than to predict it wrongly. The author thought the condition that $TPR \geq 0.70$ was acceptable⁶. Then, the author applied Youden Index J^7 under the previous condition to maximize the correct classification rate. It was achieved in the R software by using a loop to find the largest Youden Index. At last, $P_0 = 0.089$ was chosen as the optimal threshold value for Logit.AIC model's prediction.

Table 2: the output of Analysis of variance among two models

	Residual Df	Residual Dev	Df	Deviance	Pr(>Chi)
Logit	9979	3863.7			
Logit. AIC	9981	3863.8	-2	-0.11	0.9464

Table 3: the output of Analysis of variance among three models

	Residual Df	Residual Dev	Df	Deviance
Logit. AIC	9981	3863.8		
Probit	9979	3863.7	2	0.1140
Probit. AIC	9981	3863.8	-2	-0.1140

Table 4: Logit.AIC Model's Prediction Output ($P_0 = 0.089$)

		Y Prediction		Percentage Correctly Predicted
		0	1	
Y True Value	0	7040	1178	85.67
	1	183	434	70.34

⁴ In this case, TPR (True Positive Rate) means the fraction of young adults who are truly predicted as having suicidal ideation out of those with suicidal ideation.

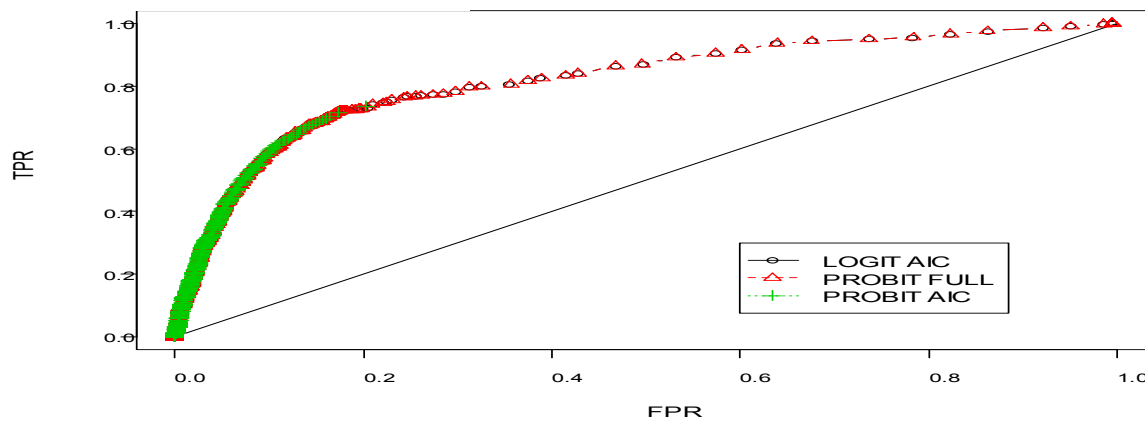
⁵ FPR (False Positive Rate), in this case, stands for the fraction of young adults having no suicidal ideation who are predicted to have out of those with no suicidal ideation.

⁶ There is no particular rule to follow. In this case, making sure the true positive rate is larger than 0.7 is to set up a threshold to choose the optimal threshold value for the later model prediction.

⁷ Youden Index $J = TPR - FPR$, which is the vertical distance from the point on ROC curve to the diagonal line. Youden Index is a commonly used criterion for finding the optimal threshold value since it aims to maximize the difference between TPR and FPR and is easy to calculate.

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Figure 2: ROC Curve



The Logit.AIC model did well in predicting the young adults with suicidal ideation. Among 617 young adults with suicidal ideation, 434 young adults were predicted correctly, making the accurate prediction rate of 70.34% (See Table 4).

TABLE 5: Logit. AIC Model Regression (N=10000)

Factors	OR	CI	
		Lower	Upper
Employment			
Employed part time	1.17	0.94	1.46
Unemployed	1.46**	1.13	1.88
Other(incl. not in labor force)	1.01	0.80	1.23
Psychological Distress			
Yes	6.26***	5.15	7.63
Any Illicit Drug Use			
Yes	1.65***	1.39	1.97
Health			
Good	1.47***	1.21	1.78
Fair	1.35	0.99	1.81
Major Depressive Episode			
Yes	4.00***	3.25	4.92
Alcohol Abuse			
Yes	1.31*	1.00	1.71
Race/Ethnicity			
Nonhispanic Black	1.43**	1.10	1.84
Others	1.03	0.84	1.26
Religiosity			
Strongly Agree	1.05	0.83	1.31
Disagree	1.00	0.77	1.29

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Strongly Disagree	1.42**	1.13	1.79
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CI: 95% confidence interval;
 *: p=0.01-0.05; **: p=0.001-0.01; ***: p=0-0.001

Using this model, we shall examine the relationships with the personal risk factors. Young adults who were unemployed were 1.46 times (95% CI=1.13-1.88, $p<.01$) more likely to have the suicidal ideation, which was significantly higher than 1. Those who were employed part time or were not in the labor force, however, showed no significant difference with the reference group in the possibility of suicidal ideation.

Consistent with previous works, young adults who had psychological distress in the past year were 6.26 times (95% CI=5.15-7.63, $p<.001$) more likely to have the suicidal ideation, showing that the psychological distress was absolutely a significant indicator of suicidal thought.

Compared with the young adults who didn't use any illicit drug in the past year, those who did use illicit drug in the last year were 1.65 times (95% CI=1.39-1.97, $p<.001$) more likely to get the suicidal ideation.

When it came to health status, young adults having a good health (a score of "3" in the 5 point response options) was 1.47 times (95% CI=1.21-1.78, $p<.001$) more likely to have the suicidal ideation compared with those who were in an excellent/very good status. However, people in fair or poor health condition didn't show higher risk compared to those in an excellent condition (OR=1.35, 95% CI=.99-1.81, $p>.05$).

Young adults who indicated from the survey, having a major depressive episode (MDE) in the past year are 4 times (95% CI=3.25-4.92, $p<.001$) more probable to have the suicidal ideation when compared with those who didn't have such psychological problem. This finding was consistent with previous works (Joiner, 2009). Joiner explained that young adults with MDE couldn't find themselves fitting into any social group, which influenced them to think about suicide to end the loneliness.

In comparison to reference group, young adults who reported having abused alcohol in the past year were 1.31 times (95% CI=1.00-1.71, $p<.05$) more likely to have the suicidal ideation.

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Nonhispanic Black adults were 1.43 times (95% CI=1.10-1.84, $p<.01$) more likely to have the suicidal ideation than the reference group (Nonhispanic White).

Those young adults who strongly disagreed with the statement that religiosity is important had 1.42 times (95% CI=1.13-1.79, $p<.01$) more likely to have suicidal thoughts compared to those who agreed. This finding was consistent with former studies (Zhang & Jin, 1996), in which religiosity is found to be negatively correlated with suicide ideation among American college students.

DISCUSSION AND FUTURE RESEARCH

Suicide is the result of a set of cumulating risk factors, and it will happen if young adults can't deal with the excessive stress caused by risks in their daily lives. It is important to distinguish young adults who will finally commit suicide by using suicidal thoughts which is served as a strong signal of suicide attempt and fatal suicide. The findings of this study provide personal-aspect factors of suicidal ideation in the subgroup of young adults aged 18-25. They are useful for mental health practitioners to identify the potential young adults who have the intent to end their lives and then give correct treatment to them.

Psychological Distress and major depressive episodes are found to be the strongest and second strongest risk factors of suicidal ideation, respectively. This result reminds the mental health and general practitioners to pay much attention on preventing young adults with psychological distress or MDE from committing suicide. For those who are unwilling to see any mental health providers, the community or family members should encourage them to do so. What's more, media, as a far-reaching approach, should take a responsible role in educating the public shaping their attitudes towards suicide and giving them some advice on mental health to minimize the possible harm.

Socioeconomic status factors including non-Hispanic black, low education level and unemployment is found to be risky for suicidal ideation. So it is recommended that mental health institutions in communities as well as family members should help comfort those young adults who have just lost their jobs to relieve their stress as much as possible. Besides, particular hotlines in the community should be set up for those

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who have stress coming from daily life and work to get immediate help at the critical times. In addition, education needs to be farther promoted to young adults in America.

Lifestyle factors: illicit drug use and alcohol abuse are positively correlated with suicidal thoughts. From schools' perspective, proscribing illicit drug and alcohol drinks in the campus is necessary to stop this unhealthy lifestyle. From communities' perspective, advocating healthy lifestyle is a strategy to reduce risks for young adults' suicidal thoughts.

The religiosity is found to be positively correlated with suicidal ideation. Holding religious belief serves as a protective factor of suicidal ideation among American young adults. Therefore, communities should educate faithless adults about the importance of having religious belief in their lives and encourage exploring religious beliefs to people.

However, the results in this paper inevitably have some limitations. First, the data collected from the survey may have some bias from the true situation resulting from some mistakes by the recipients in recalling the actual frequencies of certain actions in the past year. Second, because the psychological questions are sensitive to the recipients, it is possible to lead to some underestimation of the true act of suicidal ideation among young adults. Third, some factors such as the childhood adversities, parents' suicidal inclination, prior exposure to attempted or completed suicide are also strongly relating to the suicidal ideation among young adults; but this study doesn't include this factors such that the analysis from the survey didn't investigate such situations.

Despite the limitation, this study serves to accent the discussion and analysis of risk factors for suicidal ideation among young adults nationally. However, the findings only offer partial support to the whole category of risk factors for suicidal ideation in young adults. That is, the family risk factors and social environmental risk factors are not discussed in this study due to the lack of relevant information in the survey (See Figure 1). Future studies incorporating all dimensions of the previous conceptual model are needed in order to provide a complete picture of the factors associated with suicidal ideation. In addition, these three dimensions do overlap and are interrelated, so analytical approaches need to capture that

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interaction as well.

There are several studies concerned with the suicidal ideation among Chinese young adults that offer some comparison with their contemporaries in the United States. Dai et al. (2011) reported one-year prevalence of 5.2% for suicidal ideation among Chinese rural people aged 16-34 and 2.3 % for serious suicidal ideation based on structured interviews of 1,654 people. However, my study found the one-year prevalence of 6.9 % for serious suicidal ideation among American young adults aged 18-25. Though there were some differences in sampling and target population, the gaps revealed from that figures indicated that comparison between these two countries was worthwhile. In addition, distinguishable differences in the risk factors for suicidal ideation between Chinese young adults and their American peers were found. Zhang and Jin (1996) reported that religiosity is positively correlated to suicidal ideation among Chinese college students in China. This result is contrary to the corresponding studies on American college students based on a sample of 459 college students (Walker & Bishop, 2005). In addition, female gender was a significant risk factor among Chinese young adults (Liu, Tein, Zhao, & Sandler, 2005; Zhang & Jin, 1998). This risk factor in my study, however, shows no significance to suicidal ideation by gender. Therefore, the different patterns about suicidal ideation in young adults exhibited among these two countries and the risk factors for explaining that patterns are worth to explore for future research.

In sum, it is suggested that future studies need to explore all the dimensions of the conceptual model including their interactions and to make proper comparison of different risk factors for suicidal ideation between Chinese young adults and their contemporaries in the America.

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The submissions to this year's Research Paper Competitions demonstrated a high degree of scholarship and creative ways of analyzing data. We thank all entrants for sharing their work with us!

Undergraduate

First Place

Cultural Mismatch in the Achievement Gap: Self-construal as a Mediator Between Socioeconomic Status and Academic Achievement
Lorraine Blatt, Grinnell College (Iowa)

Second Place

The Impact of Student Background and Academic Performance on Future Income
Raphael Small, Haverford College (Pennsylvania)

Master's

First Place

Organization Decision-Making and the Market Environment: Examining Contingency in Organizational Behavior
Peter Lista, Indiana University-Bloomington

Second Place

Social Capital for Adolescents from Low-income Families: A Means to Improve Academic Achievement and Mental Health?
Jane E. Oliphant, Washington University (St. Louis, Missouri)

Resource Center for Minority Data Paper Competition

First Place

Identify the Young Adults with Serious Suicidal Ideation: A Population-Based Study
Jian Li, Central University of Finance and Economics (Beijing, China)

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