

# Impact of Socialized Uncertainty on Group Decision Making: An Experiment with Emerging Executives

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## ABSTRACT

*Many stakeholders in society are concerned about the effectiveness of decision making behavior for our future generation of leaders. Risk taking behavior has been studied in the context of cultural factors (including gender) or decision making but rarely have both of these dimensions been examined simultaneously especially with emerging business leaders. Decision making behavior has not been studied at the group level of analysis in the context of socialized culture using samples of young emerging executives. Therefore, the authors conducted a controlled experiment with senior university students to test the impact of risk taking culture and gender on group decision making behavior in a complex project. In their experiment gender did not impact decision making behavior but the socialized uncertainty was a statistically significant casual factor. The authors conducted a controlled experiment with senior university students to test the impact of risk taking culture and gender on group decision making behavior in a complex project. Although their results agreed with the literature, one finding was completely opposite from their hypothesis. In the authors' experiment, the participant's gender did not impact decision making behavior but the socialized uncertainty factor was statistically significant in the logistic regression models.*

*Keywords: Decision Making Behavior, Risk, Social Culture, Social Learning, Uncertainty Avoidance, University Students*

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## INTRODUCTION

The world has changed so much since the 2007-2008 global fiscal crisis that we wonder how today's university students will cope with complexity when they become our decision makers. Current executives will eventually retire leaving organizations to be managed by

these emerging leaders. Will this new population of leaders be socialized with a risk-taking culture focused on free choice and flexibility or will they become socialized to govern through rules and military force? How will future decision makers react in complex situations? We explored these research questions by studying the impact of socialized culture on the decision

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making behavior of future leaders while they are accessible to us in university as students.

We recognized that there was a large body of knowledge about social culture and how those factors impact individual behavior (Bell, 2007; He & Freeman, 2010; Adekola & Sergi, 2007; Bevelander & Page, 2011; Caca, 2010; Chen, Sun, & McQueen, 2010; Cooper, Edgett, & Kleinschmidt, 2009; Fujita, 2002; G. J. Hofstede, 2009; Kirkman, Lowe, & Gibson, 2006; Michailova & Hutchings, 2006; Pheng & Yuquan, 2002; Siakas, Georgiadou, & Balstrup, 2010; Strang, 2012; Vajjhala & Strang, 2014).

On the other hand we found there were many gaps in the literature concerning how the cultural factors impact decision making behavior. According to a landmark meta-analysis of the global culture research by Kirkman et al. (2006), they cited only four studies out of 180 during the preceding 25 years that examined culture in the context of decision making. Kirkman et al. (2006) cited a study by Steensma, Marino, and Weaver (2000), another by Steensma, Marino, Weaver, and Dickson (2000), an article by Mitchell, Smith, Seawright, and Morse (2000), a manuscript by Nooteboom, Berger, and Noorderhaven (1997) as well as a paper by Ali (1993). Another shortcoming with the above studies was that the samples were experienced business executives and entrepreneurs. Thus, there was a need for research investigating how the social culture factors impact the group decision making behavior of young emerging, future business leaders.

In this paper we used an experiment with students to measure the impact of social culture on group decision-making behavior for an important university assignment. The sample consisted of senior business and economics students at the State University of New York, USA. We collected demographic and social culture data from the participants by using the survey method with an a priori instrument. The group decision making dependent variable was developed by manipulating complex project alternatives.

## **PROBLEM STATEMENT AND RESEARCH OBJECTIVES**

Taking too many risks decreases the effectiveness of decision making behavior which we know was a causal factor in the 2007-2008 global financial crises. Many stakeholders in society are concerned about the effectiveness of decision making behavior for our future generation of leaders. Risk taking behavior has been studied in the context of cultural factors (including gender) or decision making but rarely have both of these dimensions been examined simultaneously especially with emerging business leaders.

Decision making behavior has not been studied at the group level of analysis in the context of socialized culture using samples of young emerging executives. Therefore, we conducted a controlled experiment with senior university students to test the impact of risk taking culture and gender on group decision making behavior in a complex project. We conducted a controlled experiment with senior university students to test the impact of risk taking culture and gender on group decision making behavior in a complex project.

## **LITERATURE REVIEW**

### **Post-2008 Group Decision Making in Uncertainty**

The global financial crisis of 2007-2008 as in other economic crises in the past has brought into focus the significance of real-world decision making within uncertainty (Meder, Le Lec, & Osman, 2013; Read, 2012). Some countries fared better than others in complex situations like the global financial crisis and this implies that some cultures may be better at group decision making. Cultures with high-level of uncertainty avoidance are better prepared to deal with such crises as they are prepared to deal with dynamic changes in the environment as compared to countries with lower levels of uncertainty avoidance (Vajjhala & Strang, 2014).

Borić and Wetwood (2003) found that managers with a risk-averse socialized culture were likely to prefer centralized decision making procedures and rule-based governance. Goic and Bilic (2008) found that people who accepted risks were more likely to adapt to accommodate changes in their external environment. Vajjhala and Strang (2014) found that the knowledge sharing behavior of Albanian entrepreneurs was low in comparison to other countries due to higher socialized cultural levels of uncertainty avoidance. Thus, culture was a way to measure socialized uncertainty.

While some decisions were taken by individuals during the 2008 crisis, most of the decision making behavior took place within groups (Read, 2012). Group-decision making behavior is significantly different from individual decision making when both individuals and groups are provided with identical information about uncertain outcomes (Bogan, Just, & Dev, 2013). According to Yukl (2010), group decision making processes are influenced by several characteristics, including the size of the group, cohesiveness, diversity of the members, communication technology used, physical environment, emotional maturity, and social culture status differentials.

Though large groups have the advantage of having access to more information, managing large groups is a complex process with difficulty in reaching consensus within the group. Highly cohesive groups are likely to be affected by group thinking leading the team decisions to be risk adverse (Yukl, 2010). Cohesiveness within a team can be managed by having a diverse member group which can be managed by demographic factors, such as, age, gender, ethnicity, and education (Yukl, 2010). Proper levels of emotional maturity in the team members, presence of a conducive physical environment, and use of advanced information technology, especially in the context of virtual groups can help groups take informed decisions (Yukl, 2010).

Several researchers had discovered that the risk taking behavior of decision makers has changed since the 2008 global fiscal

crisis. Strang (2011) examined a sample of 121 financial asset managers drawn from well-performing companies listed on the New York Stock Exchange. He found the portfolio management decision making techniques of the practitioners had changed, with less application of non-linear methods and more reliance on statistical probability distributions. Furthermore, he observed significant differences in the risk taking behavior of asset managers between gender and culture. However, Strang's (2012) study was not generalizable to the future generation of leaders because the sample was composed of experienced senior portfolio managers in the finance industry having a mean age of 45. Thus, more studies are needed to satisfy the current mandate.

Several researchers have investigated the role of gender and age in decision making process. The findings of these studies reveal different results. Some of the researchers concluded that only some aspects of the decision-making behavior are influenced by factors such as age and gender (Jianakoplos & Bernasek, 1998; Lizárraga, Baquedano, & Cardelle-Elawar, 2007). For example, the process of cognition and information processing which is instrumental in decision making are not influenced by differences in gender (Lizárraga et al., 2007).

Some of the older studies, including Jianakoplos and Bernasek (1998) have shown that individually females are more risk averse than males in the context of financial decision making. The influence of cultural dimensions as well as demographic factors such as age and gender on individual decision making behavior need to be examined in a group context because we do not know if an individual will share the same socialized cultural perspective as the dominant majority (Baker & Carson, 2011; Venaik & Brewer, 2013). According to Johnson and Powell (1994) in most of the pre-1980s literature, the dominant and accepted view was that there was an apparent inferior quality of problem solving by women as well as less inclination to taking risks as compared to men. Johnson and Powell (1994) state that

gender does not determine the quality of decision making or attitudes to risk.

However, studies conducted after 1980 have identified flaws in the manner in which the research was conducted apart from lack of empirical evidence and suggested that there was no direct relationship between gender and the quality of decisions. Byrnes, Miller, and Schafer (1999) suggest that there is no direct relationship between risk taking and gender but external factors such as perceptions of the social environment, cognitive scope, biological maturation, personal values, and characteristics of peer group may influence the risk taking behavior of individuals. Nicholson, Soane, Fenton-O'Creevy, and Willman (2005) supported this finding by stating that the relationship between gender and risk taking propensity is dependent on additional factors, including age and varies across domains such as recreation, health, career, finance, safety and social. The domain-specific nature of risk taking indicates lack of any direct relation between gender and risk taking propensity (Weber, Blais, & Betz, 2002).

The above studies indicated that there may be a significant relationship between decision making behavior and uncertainty avoidance as a socialized culture factor. In this study we refer to this as socialized uncertainty, a cultural factor. There was conflicting support for hypothesizing a relationship between decision making and gender. On the other hand, age was not proven to be a significant factor in decision making. None of studies reviewed above were designed to specifically investigate socialized uncertainty in the group context. Also none of the samples have specifically focused on young emerging decision makers such as senior university students, some of whom are likely to become our future leaders.

Therefore, we felt it was necessary to test the relationship between gender and decision making behavior. However, we felt the role of age would not be relevant to test if we were specifically sampling young participants (who are likely to become future leaders). In light of these studies we hypothesized that gender should not

be related to decision making behavior if age and the organizational factors were controlled through a controlled experiment using a sample of young participants.

**Hypothesis 1:** Gender will not be correlated with decision making behavior (when other factors are controlled).

## Global Socio-Culture Factors

Culture is defined as collective mental programming that distinguishes one group of people from another (Hofstede, 2001). Three important studies are cited in literature by researchers exploring global socialized culture factors, namely, Hofstede's cultural dimensions, Trompenaars and Hampden-Turner's cultural model, and Global Leadership and Organizational Behavior Effectiveness (GLOBE) culture study (Mooradian & Swan, 2006; Vajjhala & Strang, 2014). Although these three studies present several cultural dimensions, they certainly agree on the three cultural dimensions, namely, power distance, uncertainty avoidance, and masculinity (Tavanti, 2012).

Hofstede's cultural dimensions are quoted the most in literature on understanding national culture. Hofstede had the largest sample size with over 116,000 managers surveyed from 50 countries (Strang, 2008). These six cultural dimensions include, power distance, individualism, masculinity, uncertainty avoidance, long-term orientation, and indulgence (Geert Hofstede, 1984, 2001; G. Hofstede, Hofstede, & Minkov, 2010).

Trompenaars and Hampden-Turner's cultural model was based on 10 years of research on more than 46,000 managers in 40 countries (Trompenaars & Hampden-Turner, 1997). Trompenaars and Hampden-Turner's cultural values as described in their model include, universalism vs. particularism, collectivism vs. individualism, emotional vs. neutral, specific vs. diffused, sequential vs. synchronic, inner vs. outer direction, and achievement vs. ascription (Trompenaars & Hampden-Turner, 1997). Most

of these cultural dimensions are variations of Hofstede's cultural dimensions (Strang, 2011).

Hofstede's cultural model was updated and expanded by the GLOBE study (Brewer & Venaik, 2011). The GLOBE study was carried out in 62 countries by surveying 17,000 mid-level managers (Javidan, House, Dorfman, Hanges, & Sully de Luque, 2006; Minkov & Blagoev, 2012). The GLOBE studies maintained three of Hofstede's dimensions, power distance, uncertainty avoidance, and long-term orientation while adding other cultural dimensions (Tavanti, 2012). GLOBE and Hofstede using similar techniques and reflect similar constructs (Brewer & Venaik, 2011). The additional dimensions include humane orientation, performance orientation, institutional collectivism, in-group collectivism, assertiveness, and gender egalitarianism (Minkov & Blagoev, 2012). The GLOBE study also found that culture influences the type of leadership qualities that are perceived as leading to outstanding leadership (Javidan et al., 2006).

The consensus in the literature is that the five-factor global culture model adequately approximates the socialized culture characteristics for comparing samples on an individual, group, organizational and national level. The model developed by Hofstede is the generally-accepted five factor model. The uncertainty avoidance index from the five-factor global culture model represents socialized uncertainty. We hypothesized that socialized uncertainty was a recognizable factor in the sample with respect to validity and reliability. This would be necessary to ascertain before testing other hypothesis. Thus, we developed the following hypothesis to test this conceptualization.

**Hypothesis 2:** Socialized uncertainty will be a significant factor in explaining the survey item responses.

## Decision Making and Socialized Uncertainty

Lizárraga et al. (2007) state that decision making is one of the most complex mechanisms of

human thinking with various factors and courses of action intervening in this process producing different results. Several decision-making models have been developed by researchers, most of which are centered on rational decision making model. Owens and Valesky (2007) cited the Simon model of decision making behavior which states that there are three phases in decision making process, namely, intelligence activity, design activity, and choice activity. The intelligence activity revolves around revealing the circumstances that call for a decision, while design activity deals with the processes by which the alternative courses of action are developed. The decision making activity deals with the process of selecting the final course of action from among the available alternatives. The rational model of decision making states the five steps in decision making, including, defining the problem, analyzing the problem, developing alternative solutions, deciding on the best solution, and converting decision into effective actions (Owens & Valesky, 2007). This process of rational decision making is bound by personal and environmental factors which also include social and cultural factors (Lizárraga et al., 2007).

National cultural dimensions have been used by researchers in several studies to explain decision making behaviors exhibited by managers, especially the effect of culture on corporate financial decision making (Frijns, Gilbert, Lehnert, & Tourani-Rad, 2013). One of the key national cultural dimensions used in the context of decision making is uncertainty avoidance. Uncertainty avoidance dimension deals with the ability of the national culture in tolerating ambiguity. Individuals in high uncertainty cultures have strong identification to their group (Baker & Carson, 2011). Baker and Carson (2011) state that cultures with high level of uncertainty avoidance are risk averse. For instance, examined the role of national culture and determined that countries with higher levels of uncertainty avoidance used short-term debt (Zheng, El Ghouli, Guedhami, & Kwok, 2012). Frijns et al. (2013) emphasize that the two components of risk tolerance, namely, risk

aversion and perceived risk play an important role in decision making of Chief Executive Officers (CEOs). Risk aversion is directly related to the individual behavior to avoiding uncertainty i.e. if the uncertainty avoidance is high then the individuals are likely to be more risk averse. Individuals in cultures with high levels of uncertainty avoidance prefer stability in their lives and careers and adhere to group norms and regulations to avoid uncertainty and risk (Baker & Carson, 2011).

These studies advocate that group decision making behavior in the business context must consider the strategic mission of the organization, along with the other relevant factors in the context. Furthermore, the tolerance for taking risks in decision making will differ across socialized culture. For instance, countries having a high level of socialized uncertainty avoidance and a future orientation culture are more likely to engage in proactive behavior with the intention of adapting to dynamic changes in the economy (Baker & Carson, 2011). In contrast, decision makers in countries with a high low level of socialized uncertainty avoidance will be more likely to take risks that could result in catastrophic results. In some situations managers maybe socialized to seek flexible solutions that would help the organization respond to future dynamic changes in the economy and this may appear to be avoiding risks. Thus, the level of socialized uncertainty as a cultural factor ought to be measured in the complex group decision making context, where the other potential confounding factors could be controlled or isolated.

Based on these studies, we proposed that young emerging business executives with a high risk-taking socialized culture (low socialized uncertainty avoidance) would choose open-ended flexible alternatives when making important organizational decisions when knowing they would be faced with implementing the alternative with their employees over the short term.

**Hypothesis 3:** High risk taking propensity (low socialized uncertainty avoidance UA<sub>i</sub>)

will lead to open-ended flexible decision while a low risk taking nature will result in closed-ended contractual decision making behavior.

## LITERATURE SYNTHESIS AND RESEARCH QUESTIONS

The study of literature indicated that there may be a significant relationship between decision making behavior and uncertainty avoidance as a socialized culture factor. In this study we refer to this as socialized uncertainty, a cultural factor. There was conflicting support for hypothesizing a relationship between decision making and gender. On the other hand, age was not proven to be a significant factor in decision making.

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**Hypothesis 2:** Socialized uncertainty will be a significant factor in explaining the survey item responses.

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## METHODOLOGY

We employed a theory-dependent positivist philosophy consisting of a deductive literature review to inform the hypotheses, instrument selection, and methods. We designed a quasi-experiment with an embedded survey method technique. Since we also designed several survey items for the dependent variable, we used a pilot study to confirm the validity of those. As a safeguard, we also preformed validity and reliability checks to confirm the factors of the a priori survey instrument were valid and reliable in this sample.

Descriptive statistics, correlation, reliability and validity tests, and logistic regression were applied at the 95% confidence level (unless otherwise noted). SPSS version 14.1 was used for the statistical tests.

### Sample Frame

In terms of sampling method, natural intact convenience groups (existing classes) were used at the State University of New York (SUNY) Plattsburgh and Queensbury campuses. SUNY is a public comprehensive regionally accredited university in USA. The enrollment at this university was 6350 matriculated students, with 1050 of those in the School of Business and Economics, of which approximately 350 were in the undergraduate Bachelor of Science in Business Administration (BSBA) program forming the sample frame.

At the university level, the average class size was 22, the student-faculty ratio was 17:1, and 97% of tenure-track faculty held the highest degree (e.g., PhD or doctorate) in their discipline. The gender balance was 45.1% male, 54.9% female. International enrollment from 63 countries represented 5.4% of the population.

In the business school 65% of faculty held a relevant doctorate or at least a PhD. The size of this class was 45 due to its demand at both campuses, thus making the ratio 45:1. The researcher had taught large classes of over 600 students so he was familiar with using technology out of necessity to facilitate applying pedagogy in large cohorts. The mean age of the sample was 23 (SD=2.1), while females represented 59% of the class. There were three international students in the sample from different countries (3/45 = 6.7%). The demographic factor and GPA estimates of the sample were similar to the university's business school population (based on a t-test(349)=1.91, p-value=0.493 (one-sided).

### Instrumentation

In order to test the first two hypotheses, an a priori multicultural survey was used with permission (Vajjhala & Strang, 2014). The items associated with the uncertainty avoidance index (UA<sub>i</sub>) were used, along with customary demographic data collection questions. According to Vajjhala and Strang (2014), the survey instrument had been pilot tested with samples from USA and Albania to improve the questions prior to being utilized in for their study. The reliabilities reported by Vajjhala and Strang (2014, p. 90) were "all over 0.70 with an overall Cronbach's alpha reliability of 0.76 (N=73)." Note that only the Socialized Uncertainty Avoidance index (UA<sub>i</sub>) survey items were applied to this current study.

The response scale developed by Vajjhala and Strang (2014, p. 88) was as follows.

Each item was designed with a pair of polarized phrases to force the participant to discriminate between a low versus high degree of agreement with the underlying theoretical multicultural factor. A 1-10 nominal scale

was utilized to operationalize this. The terms left side and right side were used with color-coding to help the participant understand how to respond. Five choices were available on each side of the item scale to represent agreement with the left side phrase, where on the left, the extreme position at nominal value 1 had the explanation '90-100% of the time (very strong agreement)'. As the left-side scale progressed from 1 to 5, reducing percentiles were used with a change in wording, to indicate a lesser agreement (the 5 position on the left-side was '10-20% of the time (weak agreement)'. The right-side of the scale used a similar scheme, starting at 6 with '10-20% of the time (weak agreement)' and ending at 10 with '90-100% of the time (very strong agreement)', the latter referring to the extreme right-side position of agreement. Participants were told to indicate which selection best represented their society's view of each item.

For example, if a participant felt very strongly about the statement on the left, they would enter a 1. Alternatively, if they identified very strongly with the statement on the right, they would select a 10. Thus, 1-5 on the scale referred to the left side phrase with decreasing agreement intensity towards 5 while 6-10 referred to the right side phrase with increasing agreement intensity towards 10. There was no neutral so it was a forced choice design.

## Procedures and Variables

The third hypothesis (Hypothesis 3) was operationalized to assess the decision making risk behavior of a senior student towards a contractual versus open-ended group project assignment. This was designed as a quasi-experiment. The assignment was a group project but each student was asked to conduct this experiment of taking the leader role and selecting the project alternative that would be used for the entire group. The decision was made individually in isolation from the other team members. The participants gave informed consent but they

were not told about the details of this experiment until it was completed. Thus, in the experiment, the participants believed they were making an important decision for the team that the entire group would have to carry out together over 16 weeks.

An experiment pilot was first conducted with another class in the sample frame of business students (N=28) to develop the dependent variable structure. Debrief interviews were used with the pilot participants to assess content validity and reliability. Two designs were tested, the first using one question and the second using six questions. The one-item format was the most effective so it was selected for this study. The goal was to measure the risk-taking behavior in a three-month project decision-making dilemma. The dependent variable survey item was worded as follows, using a discrete choice scale of 1 or 2 as the response:

1. We choose the assignment using a pre-defined mandatory outline to reduce the uncertainty –OR–
2. We choose the assignment where we create the outline so we can change it if needed to overcome uncertainty.

The dependent variable survey item above was the mechanism that was used to allow the participant to select one of two project assignment variations. Random teams were formed and they were given the entire 75 minute class to make their decision together. A spokesperson (leader) was elected by the group to manage the discussion and present the final decision. This decision was made at the beginning of the 16 week term and the assignment was due at the end of the term. The entire assignment was weighted at 50% of the course grade. Both options were mapped to the course learning objectives and they utilized the same rubric for grading. The only choice was regarding the outline – all other aspects of the course remained the same for both decision alternatives.



Table 1. Descriptive statistics of sample

Factor	N	Minimum	Maximum	Mean	SD
UA1	31	1	8	3.32	2.08
UA2	31	1	9	3.19	2.21
UA3	31	1	10	4.71	2.96
UA4	31	1	10	3.65	2.57
UA5	31	1	9	2.65	2.25
UA6	31	1	8	2.90	1.93
Gender	31	1	2	1.52	0.50
Decision	31	1	2	1.55	0.50

## RESULTS AND DISCUSSION

### Preliminary Data Analysis

The average age of the sample participants was 22 (SD=1.1). These students were considered moderately high-performing since the cohort had a cumulative grade point average of 3.4 out of 4.0 and they had outperformed the USA national mean on the standardized management field test in business exam. The gender was approximately balanced with 48.4% being female and 51.6% male.

The descriptive statistics of the sample are summarized in table 1, where standard deviation is abbreviated SD. The six Socialized Uncertainty Avoidance index (UAI) factors are coded UA1 through UA6, with the response based on scale of 1-10 as explained earlier. Gender was 1=female, 2=male.

The results of the decision making behavior were:

1. Prefer assignment using a predefined outline to reduce the uncertainty = 45.2%;
2. Prefer assignment to create an outline to change if needed to overcome uncertainty = 54.8%.

### Socialized Uncertainty Hypothesis Test Results

The correlation between all factors, and the Cronbach alpha reliabilities, are listed in table 2. As anticipated most of the uncertainty avoidance items were significantly correlated with one another well above  $\pm.3$  with the exception of two estimates between UA1 and UA3 (+0.301) as well as UA1 and UA4 (+0.251). The first hypothesis (Hypothesis 1) was supported because gender was not correlated with decision making behavior (-0.100). As further indication of the lack of a relationship between the risk taking characteristics and gender, there were no other significant correlations between these factors.

The second hypothesis (Hypothesis 2) was also supported since all Uncertainty Avoidance index (UAI) items were reliable (the Cronbach alpha reliabilities were shown on the diagonals in Table 2) will be significant. The individual UAI reliabilities of the six items ranged from 0.77 to 0.88 with an overall Cronbach alpha reliability of 0.84 (standardized to 0.85). These were accepted based on research methods standards since they were all above 0.7 and most were 0.8 or higher (Elliott & Woodward, 2007).

### Socialized Uncertainty Factor Hypothesis Test Results

The third hypothesis was tested using logistic regression after first verifying that the dependent variable Decision was significantly correlated

Table 2. Correlation and reliability statistics

Factor	UA1	UA2	UA3	UA4	UA5	UA6
UA1	0.77 <sup>^</sup>					
UA2	0.41*	0.85 <sup>^</sup>				
UA3	0.30	0.37*	0.81 <sup>^</sup>			
UA4	0.25	0.67**	0.44*	0.83 <sup>^</sup>		
UA5	0.41*	0.72**	0.55**	0.55**	0.88 <sup>^</sup>	
UA6	0.42*	0.48**	0.52**	0.44*	0.79**	0.85 <sup>^</sup>
Gender#	-0.23	0.11	-0.09	0.04	0.02	-0.22
Decision	-0.30	-.515**	-.490**	-0.41*	-0.44*	-0.32

<sup>^</sup> Alpha reliabilities shown on diagonals significant at 0.05;

\* Correlation significant 05 (2-tailed);

\*\* Correlation significant at 0.01 (2-tailed);

# Gender and Decision correlation -0.100 (not listed in table). UA refers to the socialized uncertainty avoidance factor

with most of the UA<sub>i</sub> items. It was clear from the statistical estimates reported in Table 2 that the six UA<sub>i</sub> factors were correlated with the Decision variable (UA1 = -0.29, UA2 = -0.52, UA3 = -0.49, UA4 = -0.41, UA5 = -0.44, UA6 = -0.32).

We chose a forward selection logistic regression based on the Likelihood Ratio. We positioned the six UA<sub>i</sub> items as independent covariates rather than develop composite average factor covariates. We did this because we believe the independent covariate approach would afford more precision in the logistic regression. We also felt that by positioning the individual UA<sub>i</sub> items as covariates that we felt we could generalize that significant finding could be used by an organization as interview questions to select a desired leader for an important project.

The most important results of the logistic regression are summarized in Table 3. Two significant models were developed (M1 and M2 as abbreviated in Table 3). UA2 and UA3 were the only significant items. The first model (M1) was based on stepwise logistic regression using only UA2. This resulted in a Beta coefficient of -0.81 (Wald estimate of 4.499) and an odds ratio of 0.45. The -2 Log likelihood coefficient of this model was 32.56 with a Cox & Snell R<sup>2</sup>=0.28 (moderate effect size). The second model (M2) produced a Beta

coefficient of -0.85 (Wald estimate of 3.23) and an odds ratio of 0.43 for UA2 along with a Beta coefficient of -0.37 (Wald estimate of 3.99) and an odds ratio of 0.69 for UA3. The -2 Log likelihood coefficient for model M2 was 27.86 with a Cox & Snell R<sup>2</sup>=0.38 (moderate effect size). Thus, the decrease in the -2 Log likelihood for the second model was -6.89 for UA2 (significant at p=0.009) and 4.70 for UA3 (significant at p=0.03).

Model 1 was significant and model 2 was barely significant but we accepted the results for the purposes of this study. Thus, at this point we accepted the third hypothesis in as far as at least two UA<sub>i</sub> factors were significant predictors of the decision.

We conducted additional analysis to test the feasibility of using these UA<sub>i</sub> factors to predict the decision in this sample. We fitted the data to the logistic regression model and compared the actual with predicted decision decisions. These results are summarized in Table 4. In model 1 using only UA2, 100% of the decisions were correctly predicted for the open-ended adaptable decision. Only slightly more than half 57.1% of the closed-ended contractual projects were correctly classified, with an overall decision prediction classification of 80.6% using only the UA2 item.

Table 3. Logistic regression statistical estimates

Factor	B	S.E.	Wald	df	Sig.	Odds ratio
UA2(M1)	-.810	0.382	4.499	1	0.03	0.45
UA2 (M2)	-.846	0.47	3.233	1	0.07	0.43
UA3 (M2)	-.368	0.18	3.996	1	0.05	0.69
Constant	4.316	1.714	6.340	1	0.01	74.88

Note: UA1-UA3 represents the socialized uncertainty factor and M1-M2 corresponds to the logistic regression models.

In model 2 (with UA2 and UA3 items), the prediction percentages were better balanced, with model 1 at 71.4% correct for the closed-ended contractual decision and 88.2% accurate for the open-ended alternative (also with an overall 80.6% accuracy). Based on this, we accept the ability of this second model to make predictions (80.6% of the time) for this sample, as long as the alternatives are not life-threatening in nature.

## CONCLUSION

Socialized culture plays an important role to influence the decision making behavior of leaders. In particular, socialized uncertainty is an important cultural dimension that influences decision making behavior in complex group situations. Socialized uncertainty has

been measured in national culture models as a polarized factor of low uncertainty avoidance versus high uncertainty avoidance. Socialized uncertainty may also be called risk taking. People with high uncertainty avoidance cultures will usually make decisions that avoid risks even if the results would be less effective. In our study we extended this analysis into the group decision making behavior of leaders in complex situations.

In our experiment, the participant’s gender did not impact decision making behavior but the socialized uncertainty factor was statistically significant in the logistic regression models. We found that when students were risk averse they take more information into consideration, such as the highly dynamic nature of changing conditions. This facet of decision making is useful in dealing with unexpected crises, such as the

Table 4. Logistic regression model prediction estimates

Model	Observed Decision (Actual)		Predicted		
			Decision		
			Percentage	Correct	
1	2	M1	Decision	1	8
		6	57.1	2	0
	17		100.0	Overall percentage	
	80.6	M2	Decision	1	10
		4	71.4	2	2
	15		88.2	Overall percentage	

80.6

Note: The cut value was 0.500; M1-M2 refers to the models.

financial crisis of 2007-2008. Gender did not play a significant role in the decision making behavior of these young sample participants, probably due to the fact that the process of cognition and information processing is independent of gender.

## Future Research

We would recommend future research by testing more samples across different cultures to estimate the impact of uncertainty on decision making. Also we recommend testing the performance after the decision making behavior since we only estimated the predictability of socialized uncertainty for a high risk versus low risk complex choice. The findings of this study could be compared against other cultures with high uncertainty avoidance as well as moderate uncertainty avoidance. This will help determine the extent of influence of uncertainty avoidance cultural dimension on decision making in different circumstances. Future research could also include investigation to see the relationship between gender and age in the context of uncertainty in decision making. The role of generational differences and age in the context of socialized uncertainty in decision making could be investigated further.

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