UNIVERSITY OF CALIFORNIA

Santa Barbara

Sociocultural Variations in Motivation and Decision-making Under Uncertainty

A dissertation submitted in partial satisfaction of the

requirements for the degree Doctor of Philosophy

in Psychological and Brain Sciences

by

Roxie Chuang

Committee in charge:

Professor Heejung Kim, Chair

Professor Shelly Gable

Professor Karen Nylund-Gibson

Professor David Sherman

September 2021

The dissertation of Roxie Chuang is approved.

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Heejung Kim, Chair

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Karen Nylund-Gibson

_____

Shelly Gable

_____

David Sherman

August 2021

VITA OF ROXIE CHUANG
August 2021

EDUCATION

University of California, Santa Barbara Expected: September 2021
PhD. in Psychology, with Quantitative Methods in the Social Sciences emphasis
M.S. in Psychology, GPA: 4.0/4.0 December 2019

Wesleyan University May 2017
B.A. in Psychology (with High Honors), Minor in the Study of Education, GPA: 4.0/4.0

Danish Institute of Study Abroad, *Copenhagen, Denmark* August 2015 – May 2016
Core Program: Child Development in Scandinavia, Children in a Multicultural Context

AWARDS, GRANTS, & SCHOLARSHIPS

Charles McClintock Graduate Student Fellowship 2021
Awarded to one student who exemplifies the following qualities: excellent scholarship and research record, commitment to education, genuine concern for others and generous contribution to the program

Individualized Professional Skills Grant ($500) 2019
To present at the Society for Personality and Social Psychology 20th annual convention

Methods University Graduate Student Scholarship 2018 & 2019
To attend a 2-day statistical workshop on Causal Inference with Bigger and Richer Data and survey design

Freeman Asian Scholarship ($65000/year, 4 years) 2013 – 2017
Highly competitive 4-year merit-based full scholarship awarded to 1 student from 11 countries for outstanding scholastic and leadership achievements

The Thorndike Award ($3800) 2017
For excellence in psychology, given to one senior carrying out individual work for Honors

Phi Beta Kappa 2016
Election into the Connecticut Gamma Chapter of Phi Beta Kappa, a prestigious academic honor society

The Society for Personality and Social Psychology Diversity Fund Award ($500) 2016
To present at the Society for Personality and Social Psychology convention in San Diego

Wesleyan Summer Grant ($4000) 2016
Assist students in experiential learning opportunities related to their post-graduate interests

Bridge-Builder Award 2015
Awarded to a leader who strengthened the relationship between Wesleyan and Middletown

Danish Institute of Study Abroad Scholarship ($7000) 2015 – 2016
Scholarship to conduct research and attend full-year study abroad program in Copenhagen

PUBLICATIONS

Chuang, R., Ishii, K., Kim, H. S., & Sherman, D. K. (2021). Swinging for the Fences Versus Advancing the Runner: Culture, Motivation, and Strategic Decision Making. *Social Psychological and Personality Science*, doi: 1948550621999273.

Chuang, R., Wilkins, C., Tan, M., & Mead, C. (2020). Racial minorities' attitudes toward interracial couples: An intersection of race and gender. *Group Processes & Intergroup Relations*, *24*(3), 453-467. doi: 10.1177/1368430219899482.

Chuang, R., Eom, K., & Kim, H. S (2021). Religion, social connectedness, and xenophobic responses to Ebola. *Frontiers in Psychology*. doi: 10.3389/fpsyg.2021.678141

Kim, H. S., Eom, K., **Chuang, R.**, & Sherman, D. K. (2021). Psychology and the threat of contagion: How perceived vulnerability to disease moderates the link between xenophobic thoughts and support for xenophobic actions. *Personality and Social Psychology Bulletin*.

OTHER PUBLICATIONS

Chuang, R. (2016, August 1st). Summer Program for Undergraduate Research Reflection. *Society for Personality and Social Psychology*. Retrieved from http://spsp.org/events/summer-opportunities-for-students/SPUR/participant-reflections/2016/roxie

Chuang, R. (2014, August 10th). National defense key to saving democracy. *Taipei Times*, P. 8. Retrieved from http://www.taipeitimes.com/News/editorials/archives/2014/08/10/2003597052/1h

INVITED PRESENTATIONS

"Doing Research Elsewhere — Summer Program for Undergraduate Research." Professional Development Session, Society for Personality and Social Psychology 20th Annual Convention, Portland, OR, January 9th, 2019.

"The Influence of Cultural Values on Xenophobic Threat Responses." Department of Psychology, University of Paris 8, Paris, France, June 19th, 2018.

CONFERENCE PAPER PRESENTATIONS

Chuang, R., Tan, M., Wilkins, C., & Mead, C. (2020, July). *Racial minorities' attitudes toward interracial couples: An intersection of race and gender*. European Association of Social Psychology, Krakow, Poland. (Conference canceled)

Chuang, R., Eom, K., & Kim, H. S. (2019, July). *For whom does belief lead to action? Collectivism tempers the impact of political ideology on action.* Presented at the Asian Association of Social Psychology 13th biennial convention. Taipei, Taiwan.

Chuang, R., & Kim, H. S. (2019, July). *Religion, Social Connectedness, and Xenophobic Responses to Ebola*. Presented at the annual conference of the International Research Network for the Study of Science and Belief in Society. Birmingham, UK.

Chuang, R., & Kim, H. S. (2019, February). *The interactive relationship between collectivism and political ideology on social attitudes.* Presented at the Society for Personality and Social Psychology 20th annual convention Cultural Psychology Preconference. Portland, OR.

Chuang, R., Eom, K., & Kim, H. S. (2018, March). *How do religion and collectivism affect xenophobic responses to threats?* Presented at the Society for Personality and Social Psychology 19th annual convention Religion and Spirituality Preconference. Atlanta, GA.

CONFERENCE POSTER PRESENTATIONS

Chuang, R., Tan, M., & Wilkins, C. L. (2017, July). White and Asian Americans' attitudes toward White/Asian interracial couples. Presented at the European Association of Social Psychology 18th annual convention. Granada, Spain.

Tan, M., **Chuang, R.,** & Wilkins, C. L. (2017, July). Perceived scarcity reduces liking toward Asian/White interracial couples. Presented at the European Association of Social Psychology 18th general meeting. Granada, Spain.

Chuang, R., Eom, K., & Kim, H. S. (2017, May). The influence of religiosity and collectivism on xenophobic threat responses. Presented at the Association for Psychological Science 29th annual convention. Boston, MA.

Chuang, R., & Wilkins, C. L. (2016, January). Asian Americans' attitudes toward interracial couples. Presented at the Society for Personality and Social Psychology 16th annual convention. San Diego, CA.

Chuang, R., & Wilkins, C. L. (2015, July). An examination of Asians' Attitudes toward Asian/White interracial couples. Presented at the Wesleyan Research in the Sciences poster session, Middletown, CT.

Manrique, J. A., **Chuang, R.,** Park, J., & Wilkins, C. L. (2015, April) Perceptions of police. Presented at the Wesleyan Psychology Poster Session, Middletown, CT.

TEACHING EXPERIENCES

Lab Instructor, Advanced Research Methods, Statistics*, UCSB* 2017 – Present
- Taught labs in advanced research methods, helped students with scientific writing
- Worked with students on designing projects, collecting and analyzing data, and presenting

Teaching Assistant, Cultural Psychology/Introduction to Psychology*, UCSB* 2017 – Present
- Lectured a broad range of topics in Psychology courses

Statistics Tutor, Instructor: Andrea Patalano*, Wesleyan University* 2016 – 2017
- Tutor students in statistics, SPSS and scientific writing

Pedagogue Intern, Child Care Center Artibus*, Denmark* 2015 – 2016
- Examined and implemented Danish education theory in pre-school and special need classes

- Created weekly lessons to facilitate language learning, musical potential, meaningful play and social inclusion

Musical Mentor Program Coordinator/Mentor, Green Street Arts Center, *CT* 2013 – 2015
- Coordinated music mentorship between Wesleyan and Middletown public school students
- Collaborated with Dr. David Nelson to train Wesleyan mentors on music pedagogy
- Developed music curricula, organized group activities and taught violin lessons weekly

Social Psychology Teaching Assistant, Instructor: Scott Plous, *Wesleyan Univ.* 2014
- Improved students' learning experience by holding office hours and social events
- Created exam questions and lead review sessions to aid students' understanding of the topics

RESEARCH EXPERIENCES

Graduate Researcher, Cultural Psychology Laboratory, *UCSB* 2017 – Present
- Advisor: Dr. Heejung Kim
- Research intergroup processes, motivation, and decision-making across cultures

Honors Thesis, Realistic group conflict theory and attitudes toward Asian/White interracial couples.
- Received High Honors (April 2017)
- Advisor: Dr. Clara L. Wilkins

Laboratory Manager, Social Identity and Intergroup Bias Laboratory, *Wesleyan* 2016 – 2017
- Oversaw research projects, facilitate lab meetings, and present research
- Coordinated and trained research assistants, conduct statistical analyses, write ethics proposals

Research Scholar, Society for Personality and Social Psychology, *UC Santa Barbara* 2016
- Selected as one of the four SPSP Summer Program for Undergraduate Research scholars
- As the first author, collaborate with Dr. Heejung Kim and Kimin Eom on publishing two papers
- Researched the influence of SES and religiosity on xenophobic threat responses

Research Assistant, Social Identity and Intergroup Bias Laboratory, *Wesleyan* 2015 – 2016
- Designed research projects, analyzed data, and presented posters
- Examined perceptions of police when prompted with the Black Lives Matter movement

Research Fellow, Research in the Sciences Fellowship, *Wesleyan* 2015
- Researched attitudes toward interracial couples in the U.S. to examine intergroup processes
- Presented study at poster session and developed honors thesis

Industry Research Apprentice, American Federation of Labors, *Washington, D.C.* 2015
- Organized Montgomery County taxi drivers and drafted bills to improve working condition
- Researched electric bus industry, prepared company profiles presented to the board

ABSTRACT

Socio-cultural Variations in Motivation and Decision Making Under Uncertainty

by

Roxie Chuang

People of varying sociocultural background differ in their motivations and decision-making processes. Across two chapters, national culture and socioeconomic status were examined as factors that might drive individual's motivational orientations, which in turn could predict their decision-making processes and strategies. Chapter 1 investigated cross-cultural differences in strategic risky decisions in baseball—among professional baseball teams in North America and Japan (Study 1), and among baseball fans in the US and Japan (Study 2—pre-registered). Study 1 analyzed archival data from professional baseball leagues and demonstrated that outcomes reflecting high risk-high payoff strategies were more prevalent in North America whereas outcomes reflecting low risk-low payoff strategies were more prevalent in Japan. Study 2 investigated fans' strategic decision-making with a wider range of baseball strategies as well as an underlying reason for the difference: approach/avoidance motivational orientation. European American participants preferred high risk-high payoff strategies, Japanese participants preferred low risk-low payoff strategies, and this cultural variation was explained by cultural differences in motivational orientation. Baseball, which exemplifies a domain where strategic decision making has observable consequences, can demonstrate the power of culture through the actions and preferences of players and fans alike. Chapter 2 examined whether socioeconomic status played a role in college students' motivations and decision-making. Study 1 examined whether socioeconomic status predicted people's decision-making processes and strategies, and

whether this association would be partly explained by the socioeconomic differences in approach and avoidance motivations. While socioeconomic status predicted certain decision-making process and strategy, these associations were not explained by approach and avoidance motivations. Study 2 investigated whether gain (approach)/loss (avoidance) message framing vary in their effectiveness in promoting academic related interactions for college students from different socioeconomic backgrounds. Different from hypothesized, loss message framing was not more effective for students of lower socioeconomic status, and gain message framing was not more effective for students of higher socioeconomic status. Both chapters aimed to demonstrate the importance of understanding the role of sociocultural background in the study of decision-making and motivation.

TABLE OF CONTENTS

Sociocultural Variations in Motivation and Decision-Making Under Uncertainty

From the moment people wake up, they find themselves in innumerous situations in which they have to make choices — Which outfit to wear? What to eat for breakfast? And which route to take to work? etc. Some of these choice-making situations could be inconsequential, but others might have great impact on people's lives, such as career choice or health related issues. Human behavior can be thought of as a series of decision-making opportunities, and each person approaches their decision-making opportunities with different goals, motivations, feelings and emotions. Therefore, understanding what influences the way people make decisions is central to the study of human behavior.

Different people approach decision making situations differently. Personality is one of the factors that influences how people make decisions. People high on extraversion and openness were more likely to make risky decisions, whereas people high on neuroticism and agreeableness were less likely to take risks (Nicholson et al., 2005). Age also affects the way people make decisions. Older adults took longer and were more likely to utilize diverse strategies when making decisions compared to younger adults (Mienaltowski, 2011; Taylor, 1975). Other individual differences such as motivation also play a role in people's decision-making processes. People high on approach motivation bet larger amounts and felt more confident about their bet following a loss, whereas people high on avoidance motivation made more non-risky decisions after a loss (Kim & Lee, 2011).

In addition to individual factors, people's socio-cultural background such as national culture and socioeconomic status also play a role in their decision-making. Indians (collectivists) took longer to make decisions, were less likely to choose according to their personal preferences, and were less motivated to express their preferences through choice

compared to Americans (individualists) (Hofstede, 1983; Savani et al., 2008). While middle class individuals preferred choices that was different from others, working class individuals preferred choices that were similar to others (Stephens et al., 2007).The present proposal aims to examine socio-cultural variations in decision-making processes and strategies under uncertainty.

Sociocultural Factors and Motivation

One of the ways in which sociocultural factors influence people's decision-making strategies is through motivation orientation. Though there have been a variety of conceptualizations of approach and avoidance motivation (e.g. Carver & White, 1994; Higgins, 1998; Elliot, 1999a), there is a general consensus that approach motivation is driven by the pursuit of incentive, reward and positive outcome, while avoidance motivation is driven by a desire to avoid threats, punishments and negative outcome (Gable, 2015; Elliot, 1999a; Elliot et al., 2001).

In terms of national culture, people with stronger interdependent self-construal (collectivists) are more avoidance oriented while people with stronger independent self-construal (individualists) are more approach oriented (Elliot et al., 2001). Since social relationships are crucial for survival in interdependent cultures (Adams, 2005; Kim, Sherman, & Taylor, 2008; Kim & Lawrie, 2019), receiving others' negative evaluation comes with a huge cost (Morling, Kitayama, & Miyamoto, 2002; Heine et al., 1999). Losing a relationship will likely have a stronger psychological and social impact than gaining a new relationship, so collectivists individuals often need to put themselves in others' perspectives in order to maintain relationships. This puts them in a relatively powerless state (Kim & Lawrie, 2019), which activates an inhibition/avoidance tendency (Keltner, Gruenfeld, &

Anderson, 2003). Having an inhibition/avoidance tendency means that collectivists behave with the goal to prevent undesired or negative outcome (Elliot, 1999). On the other hand, in independent cultures where the cost of losing a relationship is relatively low, individuals are in a more powerful state, which promotes an approach tendency (Keltner, Gruenfeld, & Anderson, 2003). This means that individualists behave to achieve a desired/positive outcome.

Studies have demonstrated national cultural difference in people's motivation orientations (e.g. Aaker & Lee, 2001; Lee, Aaker & Gardner, 2000; Hamamura, Meijer, Heine, Kamaya, & Hori, 2009). In one study, South Korean (more collectivistic) and American (more individualistic) participants listed their personal goals. Coders categorized each goal as approach or avoidance and found that people in collectivistic cultures adopted more avoidance goals than those in individualistic cultures (Elliot et al., 2001). Other studies have also found that Asians (more collectivistic) tended to be more motivated by failure and loss-framed messages, whereas Westerners (more individualistic) tended to be more motivated by success and gain-framed messages (Heine et al., 2001; Uskul et al., 2009).

In addition to national culture, people's socio-economic background may also drive their motivation orientations. Middle/upper class individuals, with greater access to economic capital and higher status (Pascarella & Terenzini, 1991; Day & Curry, 1998), are more likely to be approach oriented as they adopted more approach goals (Schnelle et al., 2010); lower class individuals, with limited resources and harsher living environments, are more likely to be avoidance oriented as they adopted avoidance goals (Schnelle et al., 2010). This may be explained by the difference in outcome expectancy — the expectations that an individual has in regard to their ability to achieve their goals — between higher and lower class individuals.

The fewer resources one has, the less likely the person believes they could achieve their goals, therefore, the potential failure may become salient, which leads to the individual's strong motivation to avoid such failure (Bandura, 1977, 1990; Schnelle et al., 2010). In contrast, the more resources one has, the more likely the person believes they could realize desired outcomes, which drives the adoption of approach goals (Diener & Fujita, 1995; Elliot & Church, 1997).

Furthermore, being in lower/working class fosters a stronger interdependent self-construal as people need to rely on others' support and maintain relationships, whereas being in middle/upper class fosters a stronger independent self-construal as people have more resources available and do not need to rely on others as much (Stephens et al., 2014; Freeman, 1997; Snibbe & Markus, 2005). As discussed above, people with stronger interdependent self-construal are more avoidance oriented while people with stronger independent self-construal are more approach oriented (Elliot et al., 2001). Therefore, lower class individuals would be more avoidance oriented and higher class individuals would be more approach oriented. Indeed, A study with international data found that lower socioeconomic status potentially highlights relational-based motivation, such as fear of rejection, which is associated with avoidance goal adoption (Lochbaum et al., 2020). In sum socioeconomic status and national culture drive people's motivation orientations.

Motivation and Risk-taking

These sociocultural differences in motivation may affect people's risk-taking, one of the most commonly studied decision-making processes. Some definitions of risk considered it as a compound measure appraising probability and magnitude of an adverse effect/negative outcome (Schwing & Alberts, 1980). However, researchers argued that risk is a complex

concept that involves more than just the outcome. Yates (1992) described risk as a decision problem that includes three aspects — loss, the significance of loss, and the uncertainty associated with loss. He also considered loss in relation to the decision maker's own reference point and subjective value system, suggesting that risk may be perceived differently for each individual (Yates, 1992). For example, spending $100 to gamble may be associated with different perceived risk for different people, depending on what losing $100 means to the gambler, how likely does the gambler think they will win/lose etc. Trimpop (1994) argued that many other components such as possible gains and non-monetary gains and losses (e.g. social and psychological) are also crucial in risk-taking. He proposed that risk taking is any conscious or unconscious controlled behavior with perceived uncertainty about its outcome, which also includes possible benefits or costs for physical, economical, social, or psychological well-being of self or others. I consider this definition to be more well-rounded, and relevant to the scope of this research because of its inclusion of both loss and gain in multiple aspects (e.g. psychological and social) in addition to monetary value.

One of the most influential theory regarding risk taking is the prospect theory (Kahneman & Tversky, 1979). The model shows how people decide between alternatives that involve uncertainty. Instead of evaluating the absolute outcome, people think in terms of relative expected utility by using a reference point. The prospect theory suggests that people are loss averse. The pain of losing is psychologically twice as powerful as the pleasure of gaining, therefore, people are more willing to take risks to avoid losses than to make a gain. In general, they have to be offered a gain more than two times as much as a loss in order to be willing to take a risk for the chance of a gain (Kahneman & Tversky, 1979). The prospect theory also indicates that people tend to be more risk-averse when it comes to gains, but are

more risk seeking when it comes to losses. That is, people do not tend to take risks when things are going well or improving, whereas people are more likely to take risks hoping to make up for previous losses (Kahneman & Tversky, 1979). The prospect theory highlights that people don't make completely rational decisions by simply maximizing the absolute outcome and that there are situations in which people seek or avoid taking risks.

While this theory is widely applicable, studies have shown that there are individual differences in the extent to which people are risk averse or risk-seeking. For example, people's risk-taking propensities may be associated with approach/avoidance motivations. One study found that higher approach motivation predicted lower bilateral insular cortex activation (decreased risk processing), which in turn, was linked to higher risk-taking behaviors (M. Li et al., 2019). Other research showed that stronger approach motivation or weaker avoidance motivation was associated with higher risk taking behaviors in health and financial domains (e.g. Demaree et al., 2008; Kim-Spoon et al., 2016; van Leeuwen et al., 2011). In this proposal, I will investigate sociocultural differences in risk-taking tendencies and decision-making processes, and identify a psychological mechanism — motivational orientation — to explain the difference. The two sociocultural factors that I will examine are national culture and socioeconomic status.

Overview

The majority of literature examining risk taking propensity when making decisions under uncertainty focus on the financial domain (e.g. Griskevicius et al., 2011; Kahneman & Tversky, 2012; Kanagaretnam et al., 2014; Li et al., 2013). However, as Trimpop (1994) argued, social and psychological gains and losses of self or others are also crucial components in the study of risk-taking. Therefore, I set out to examine the cultural influence

on decision making strategies through motivation in contexts with real-life consequences that may not be financial.

Chapter 1 investigated cross-national differences in strategic risky decisions in baseball. Two studies assessed the performance of professional baseball players and the perspectives of fans respectively. Study 1 analyzed archival data from Major League Baseball (MLB) in North America and the Nippon Professional Baseball (NPB) in Japan to examine whether there are cultural differences in frequencies based on the use of high risk-high payoff strategies (assessed by home runs and strikeouts) and low risk-low payoff strategies (assessed by sacrifice hits). Study 2 investigated Japanese and American baseball fans' varying decision-making preferences with a wider range of strategies, as well as an underlying reason for the difference: approach and avoidance motivations.

Chapter 2 aimed to examine differences in decision-making under uncertainty among students of varying socioeconomic status in domains that are relevant to college students. The goal of Study 1 was to establish the mediating role of approach and avoidance motivations in the association between socioeconomic status and decision-making processes/ strategies. I predicted that when making decisions under uncertainty, low risk-low payoff strategies with the goal of minimizing the risk of failure would be preferred by people from lower socioeconomic status, as they have a stronger avoidance motivation. On the other hand, high risk-high payoff strategies hoping to maximize the potential of reward would be preferred by people from higher socioeconomic status, as they have a stronger approach motivation. Study 2 experimentally manipulated message framings to examine whether the effectiveness of messages depended on the framing as well as the students' socioeconomic status. While both messages advocated for the same beneficial behavior for college students

— interactions with instructors, they differed in their gain vs. loss framing. I expected that loss framed message, focusing on how to not do badly, would be more effective for students from lower socioeconomic status, whereas gain framed message, emphasizing how to do well, would be more effective for students from higher socioeconomic status.

Chapter 1

Swinging for the Fences vs. Advancing the Runner: Culture, Motivation, and Strategic Decision Making[1]

The experience of attending baseball games varies across countries. The cheering sounds different, stadium food varies, and the entertainment between innings differs. At baseball games in the U.S., fans eat Cracker Jacks and hot dogs, but in Japan, fans eat rice balls and from bento boxes. There is, however, one thing that seems to be the same—the baseball game itself. All over the world, pitchers, hitters, and fielders follow the same basic rules as they throw, bat, and catch the ball.

Originating in the United States in the 1840s, baseball has been described as the "unique paragon of American culture" (Stark, 2009). Baseball has also become an important presence in other nations, such as Cuba, Dominican Republic, and Japan. Yet, however timeless and universal this old ball game may seem, local culture dictates how the game is played and perceived. Players from different cultures may opt for varying strategies and fans may respond to certain strategies or outcomes differently. For example, lay observations indicate that Americans prioritize home runs, a high risk-high payoff strategy, while Japanese adopt the "small ball" strategy — getting runners on base, trading an out to advance a runner by bunting—a low risk-low payoff strategy (Kuhn, 2015). In both countries, the goal of each team is the same, but the strategy they take may differ.

If these observations are valid, the question remains why Japanese and Americans have different approaches to baseball. Some have suggested physical differences—Americans are

[1] This chapter is a published article in Social Psychological and Personality Science. Chuang, R., Ishii, K., Kim, H. S., & Sherman, D. K. (2021). Swinging for the Fences Versus Advancing the Runner: Culture, Motivation, and Strategic Decision Making. *Social Psychological and Personality Science*, 1948550621999273.

bigger and taller and so play with more power (Kuhn, 2015). We suspect that physical differences do not fully explain disparities in baseball strategy, and that the different approaches to baseball choices may reflect broader cultural differences.

In this paper, we investigate whether Japanese and Americans indeed differ in their willingness to make risky decisions, as represented in specific baseball strategies, and if so, what the underlying psychological process is. More specifically, we compare offensive statistics of teams in the Major League Baseball in North America and the Nippon Professional Baseball in Japan in an archival study (Study 1), and assess the role of approach and avoidance motivations in explaining cultural differences in the preferred strategies of baseball fans in the U.S. and Japan (Study 2).

Risk and Decision-making

In classical decision theory, risk is perceived as the variation in the distribution of possible outcomes (March & Shapira, 1987). Riskier choices are associated with larger variation, which means that the range for the amount of possible gain or loss is wider. People use risk to evaluate alternatives and when the expected payoff is constant, people generally prefer smaller over larger risks (Arrow, 1965; March & Shapira, 1987). However, when it comes to risk-taking in real life, the payoff is not constant. A storeowner who is an aspiring actor could remain a storeowner, or move to Hollywood, wait tables, audition, and hope for the big break. Remaining a storeowner has lower risk, but a lower potential payoff; acting has higher risk, and a higher potential payoff.

People vary in how much risk they are willing to take. As people age, they are less likely to take risks; people high on extraversion and openness are more likely to take risks, whereas people high on neuroticism and agreeableness are less likely (Nicholson et al.,

2005). When people experience heightened emotional states, they are more likely to engage in risky actions than when they are less emotional (see Cyders & Smith, 2008, for review). In addition to intrapersonal psychological factors, social and cultural factors also influence risk-taking.

Culture, Motivation, and Risk

Culture influences individual motivation, and impacts people's goals, decisions, and emotions (e.g., Kim & Lawrie, 2019; Kitayama et al., 2000; Markus & Kitayama, 1991; Weber & Hsee, 2000). Empirical studies have shown that East Asians and European Americans differ in their orientation toward approach and avoidance motivation. Approach motivation is when behavior is directed by the goal to achieve a desirable outcome, whereas avoidance motivation is when behavior is directed by the goal to avoid an undesirable outcome (Elliot, 1999a). Those from Asian cultures tend to be more avoidance and prevention oriented, and those from North American cultures tend to be more approach and promotion oriented (Aaker & Lee, 2001; Elliot et al., 2001; Hamamura et al., 2009; Lee et al, 2000).

Approach/avoidance motivations influence a range of psychological processes. The Behavioral Activation System (BAS) is theorized to sensitive people to rewards and to motivate them towards approaching actions that would result in positive affect whereas the Behavioral Inhibition System (BIS) is theorized to inhibit or avoid behavior that may result negative outcomes (Gray, 1990). Approach / avoidance motivations have been operationalized as an individual difference; people who score higher on the BIS scales respond with greater negative emotion when anticipating negative outcomes whereas people

who score higher on the BAS scales respond with greater positive emotion when anticipating a reward (Carver & White, 1994).

Approach/avoidance motivation also influences the way people from different cultural backgrounds view and recall events. Among participants who recalled events from a list, North Americans were better able to recall approach events relative to avoidance events, whereas Japanese showed better recall for avoidance than approach events (Hamamura et al., 2009). Japanese tend to be more motivated by failure, whereas European Canadians tend to be more motivated by success (Heine et al., 2001). Asians tend to be more motivated by failure and loss-framed messages, whereas Westerners tend to be more motivated by success and gain-framed messages (Heine et al., 2001; Uskul et al., 2009). Importantly, this difference may affect people's strategies to achieve their goals. White British participants had stronger intentions to engage in healthy behaviors after reading messages that emphasized gains whereas East Asian participants had stronger such intentions after reading messages that emphasized losses (Uskul et al., 2009). Moreover, using sports as a context, a tennis game framed as an opportunity to avoid a loss was recalled better than one framed as an opportunity to achieve a win among Hong Kong participants, with the reverse pattern observed among European American (Aaker & Lee, 2001).

Therefore, we predicted that low risk-low payoff strategies that minimize the risk of failure would be more utilized in Japan, and that high risk-high payoff strategies that maximize the potential of reward would be more utilized in the U.S. We predicted that these cultural differences in strategies may be rooted in more general cultural differences in approach/avoidance orientations.

Overview of the Present Research

We examined cultural differences in strategic decision-making with two studies, assessing both the performance of professional baseball players and the perspectives of fans. To examine outcomes reflecting strategy use in realistic high stake situations, Study 1 analyzed archival data from Major League Baseball (MLB) and the Nippon Professional Baseball (NPB) to examine whether there are cultural differences in frequencies of home runs, which have potential for great gain but a lower chance of success, strikeouts, a negative outcome associated with attempting to hit home runs, and sacrifice bunts[2], which have potential for small gain but a higher chance of success. Study 2 investigated fans' preferences with a wider range of strategies, and examined Japanese and American baseball fans' strategic decision-making under various baseball scenarios.

Study 1

The purpose of Study 1 was to examine differences in baseball outcomes reflecting approach and avoidance motivations between North America and Japan based on the use of high risk-high payoff strategies (assessed by home runs and strikeouts) and low risk-low payoff strategies (assessed by sacrifice bunts) of professional baseball teams. We expected that the number of home runs and strikeouts per game would be larger in North America, a more approach oriented culture, than in Japan, a more avoidance oriented culture. In contrast, the number of sacrifice bunts per game was expected to be larger in Japan than in North America.

Method

[2] A sacrifice bunt occurs when a batter advances one or more runners by bunting the ball while making an out.

We analyzed the data of home runs, strikeouts, and sacrifice bunts for the past 15 baseball seasons (2005-2019) of MLB teams (29 in total, Houston Astros was excluded from the analyses as it changed league in 2013) and all NPB teams (12 in total). The data for MLB teams and NPB teams were obtained from credible webpages (MLB: https://www.baseball-reference.com/, NPB: http://npb.jp/). Data from a total of 70,462 MLB games and 25,778 NPB games were analyzed. The time range started in 2005, the earliest season available on the NPB webpage.

Results

Home runs

To test the difference in home runs between US and Japanese baseball teams, a 2 (culture: North America vs. Japan) x 2 (League: with DH rule vs. no DH rule)[3] x 15 (seasons) mixed model ANOVA was performed on the mean number of home runs per game. As expected, the main effect of culture was significant, $F(1, 37) = 36.84$, $p < .001$, $\eta^2_p = .50$, 95% CI [0.26, 0.68]. The mean number of home runs was significantly higher in the North America ($M = 1.06$, $SD = 0.23$) than in Japan ($M = 0.82$, $SD = 0.24$). Figure 1.1 shows the consistency of the country effect over time. On average, an MLB fan would see about 1 additional home run every 5 games than an NPB fan. (See Appendix A Table S1 for descriptive statistics, and Appendix A Table S2 for full ANOVA results.)

[3] The American League of MLB and Pacific League of NPB adopt the designated hitter (DH) rule, where a DH—a stronger hitter more likely to hit home runs, is assigned to bat in place of the pitcher. The Central League and the National League let the pitchers hit, who are more likely (as weaker hitters) to sacrifice bunt. Therefore, we include league (DH-rule vs. no-DH rule) as a factor in our analyses.

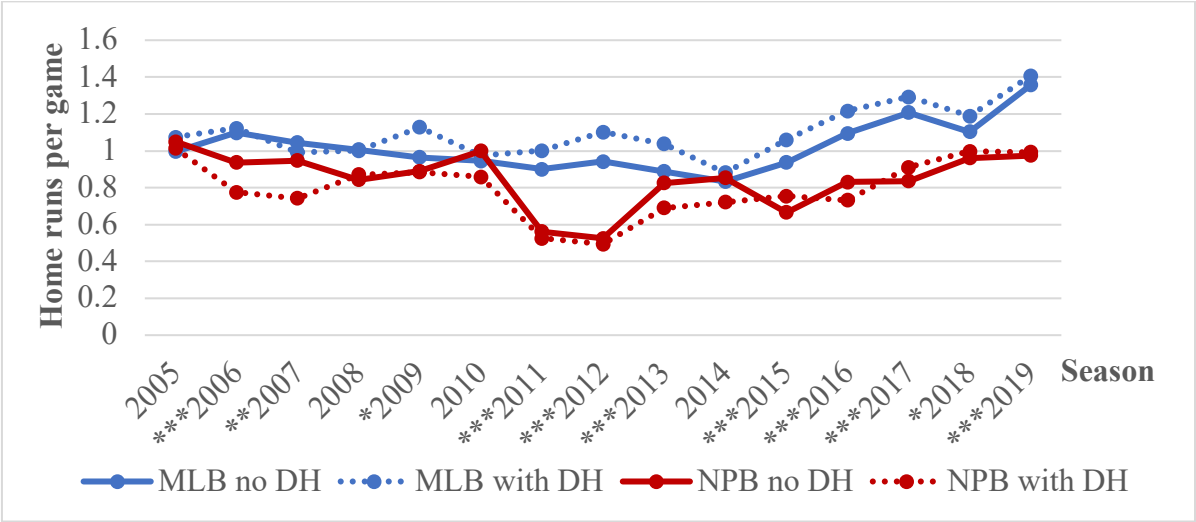

Figure 1.1. Number of home runs per game during the 2005-2019 seasons (***$p < .001$, **$p < .01$, *$p < .05$ indicate significance of cultural difference for that season)

Strikeouts

Home runs are successful outcomes of a relatively high risk strategy. However, high risk strategies are more likely to result in failure as well. To examine the flip side of a high risk strategy, we examined strikeouts. Because strikeouts can result from failed attempts of home run, they are strongly correlated with home runs in Major League Baseball (Jordan, 2018). A 2 (culture: North America vs. Japan) x 2 (League: with DH rule vs. no DH rule) x 15 (seasons) mixed model ANOVA was performed on the mean number of strikeouts per game. The main effect of culture was significant, $F(1, 37) = 37.26$, $p < .001$, $\eta^2_p = .50$, 95% CI = [0.27, 0.66] as strikeouts per game was larger in North America ($M = 7.52$, $SD = 1.03$) than in Japan ($M = 6.91$, $SD = 0.60$). Figure 1.2 shows the country effect over time. (See Appendix A Table S3 for descriptive statistics, and Appendix A Table S4 for full ANOVA results.)

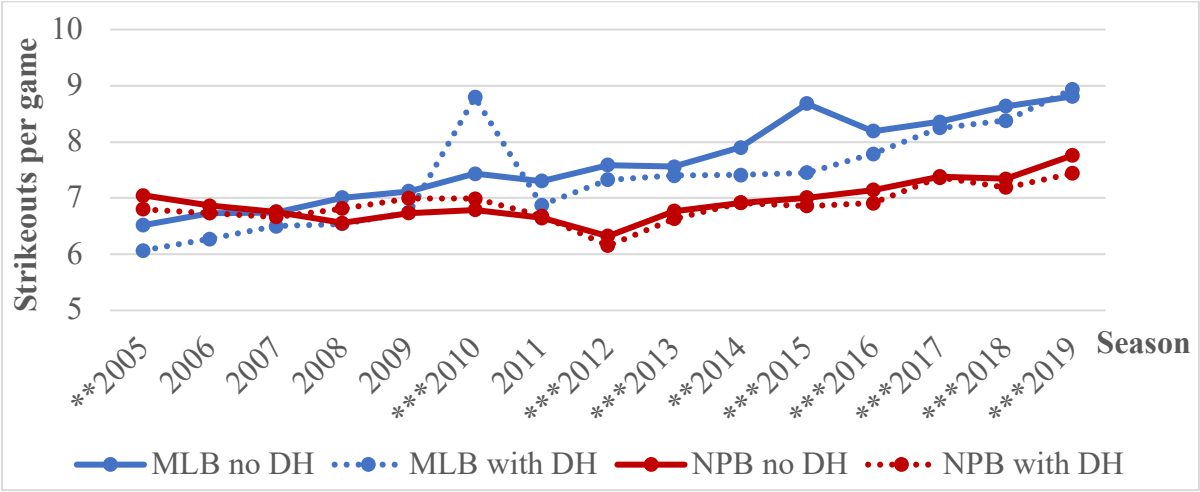

Figure 1.2. Number of strikeouts per game during the 2005-2019 seasons (***$p < .001$, **$p < .01$, *$p < .05$ indicate significance of cultural difference for that season)

Sacrifice bunts

A 2 (culture: North America vs. Japan) x 2 (League: with DH rule vs. no DH rule) x 15 (seasons) mixed model ANOVA was performed on the mean number of sacrifice bunts per game. There was a main effect of culture, $F(1, 37) = 1112.81$, $p < .001$, $\eta^2_p = .97$, 95% CI [0.94, 0.98]. The mean number of sacrifice bunts was significantly higher in Japan ($M = 0.83$, $SD = 0.19$) than in North America ($M = 0.28$, $SD = 0.13$) (see Figure 1.3). A fan watching 2 Japanese baseball games, on average, would observe 1-2 sacrifice bunts, whereas in North America, a fan would see about 1 sacrifice bunt every 4 games. (See Appendix A Table S5 for descriptive statistics, and Appendix A Table S6 for full ANOVA results.)

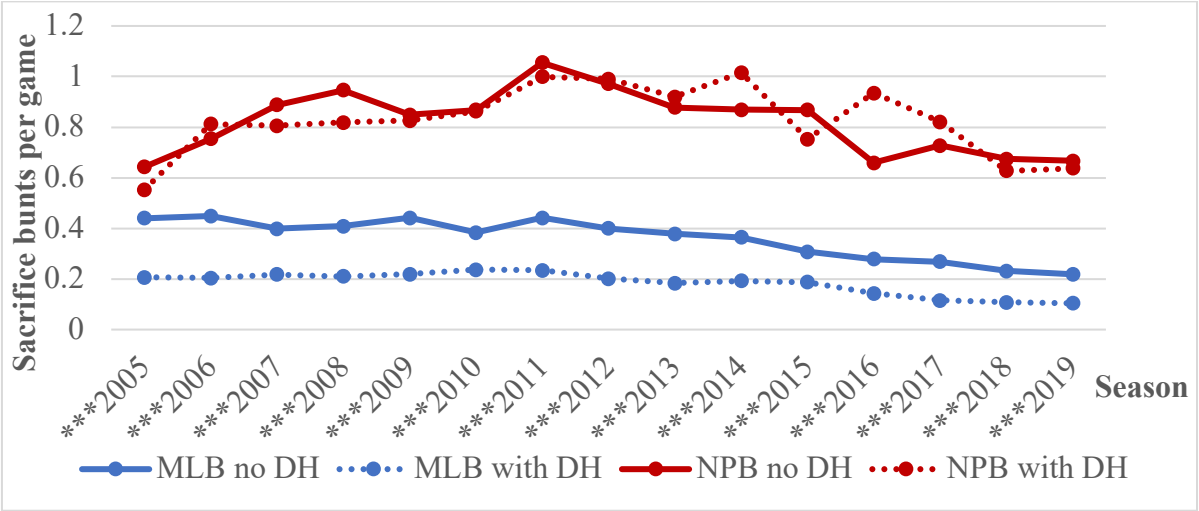

Figure 1.3. Number of sacrifice bunts per game during the 2005-2019 seasons (***$p < .001$, **$p < .01$, *$p < .05$ indicate significance of cultural difference for that season)

As reported in Tables S2, S4 and S6, there were higher order interactions involving culture, season, and league. The interactions indicate that the cultural differences are stronger in some years than others and in some leagues than others reflecting the overall variability from year to year. This variability is why it is important to examine multiple observations per sport and over time, which is what is reflected in the main effects of culture. It is beyond the scope of our paper to discuss variability in season or variability in league interact with our focal variable of culture. What is clear though is that the hypothesized cultural differences are robust to the various unhypothesized interactions among culture, season, and league.[4]

[4] One factor that could account for variability across seasons was Japan's decision to change its baseballs. NPB changed their ball configurations in 2011 in such a way that may have led to reduced home run production (Jaffe, 2013) but then changed again in 2013 to increase home run production (Bangkok Post, 2013; Brisbee, 2013). In Appendix we report additional analyses that omit 2011 and 2012 seasons. Results remained consistent with our hypotheses. In Appendix, we also report additional analyses for home runs, strikeouts and sacrifice bunts from a sample of 10 tournaments (4 Olympics, 4 World Baseball Classics, and 2 Premier 12 competitions) where statistics for US and Japan were available. In these tournaments, the teams used identical equipment. Results were in consistent direction with the primary analyses reported here (overall sign test was significant with 22/28 comparisons supporting our predictions ($p = .003$) and paired t-tests significant for strikeouts and sacrifice bunts. See Appendix https://mfr.osf.io/render?url=https://osf.io/mbzcg/?direct%26mode=render%26action=download%26mode=render

In summary, Study 1 supported our hypotheses. MLB teams exhibited more high risk-high payoff strategies (home runs and strikeouts) than the NBP teams, and the NBP teams exhibited more low risk-low payoff strategies (sacrifice bunts) than the MLB teams. Beyond the unhypothesized interactions among culture, season, and league, the hypothesized main effects of culture were robust. Building on this archival study, we next examined if baseball fans from these cultures would also prefer baseball strategies that match their motivational orientations.

Study 2

The purpose of Study 2 is two-fold. First, it directly examined the mediating role of approach/avoidance motivational orientation. Second, the MLB and NPB consist of players and coaches from many cultures (about 35% of MLB players in 2017 were Asian or Latino (Lapchick et al., 2018), and 10% of NPB players in 2020 were not Japanese (NPB, 2020)). Yet, teams which consist of individuals from different cultures utilize strategies consistent with local cultural expectations. We infer that at least one of the reasons for this is players' responsiveness to what is expected and appreciated by local fans. Therefore, in Study 2, we recruited European American baseball fans and Japanese baseball fans to represent two groups that differ on the cultural dimension of approach-avoidance orientation (Hamamura et al., 2009). Study 2 presented fans with a series of binary strategic choices (high risk-high payoff or low risk-low payoff). Examining these fans enabled a clearer test of whether a preference for high risk-high payoff strategies versus low risk-low payoff strategies was a culturally shared normative experience.

We hypothesized that there would be a cultural difference such that European American fans would choose a higher proportion of high risk-high payoff versus low risk-

low payoff strategic decisions relative to Japanese fans. We further hypothesized that the cultural difference in strategic decision-making would be mediated by cultural differences in motivational orientation.

Building on the research demonstrating cultural differences between Japanese and Americans in the impact of approach/avoidance motivation (Hamamura et al., 2009), in Study 2, we assessed approach / avoidance motivational orientation using the Behavioral Inhibition System / Behavioral Activation System (BIS/BAS) Scales (Carver & White, 1994). Approach motivation is theorized to relate to the energization of behavior toward positive stimuli and avoidance orientation, correspondingly, as the energization of behavior away from negative stimuli (Elliot, 2006), and the scales were validated with experiments that correspond to specific situations designed to evoke reward or punishment (Carver & White, 1994). The effect of BIS/BAS is theorized to be heightened by conflict or uncertainty, the likes of which are highly characteristic of a competitive event such as a baseball game; under uncertainty, BAS activates behavior toward incentive, whereas BIS detects conflict and resolves conflict by facilitating defensive behavior (Berkman et al., 2009; Gray & McNaughton, 2000). Thus, we theorized that individual difference assessments of the BIS/BAS would underlie cultural differences in the strategic choices of baseball fans.

Method[5]

Sample

Our target sample was European American baseball fans and Japanese fans. We

[5] This study was pre-registered on OSF (https://osf.io/md2fb/?view_only=1891a1dd55c1418b8e62801fc401d204). The data and code for Studies 1 and 2 is available on OSF (https://osf.io/cqxs2/?view_only=f6be86aa336d451bb05182972104c694). The materials for Study 2 are also available on OSF (https://mfr.osf.io/render?url=https://osf.io/yr6v5/?direct%26mode=render%26action=download%26mode=render).

prescreened for knowledgeable baseball fans based on a simple baseball knowledge test.

354 European American participants were recruited through Mechanical Turk (the study was open only to those who pre-indicated to be European (Caucasian) Americans on Mechanical Turk). 112 participants were excluded for not having enough baseball knowledge (5 people who failed the attention check also failed the baseball knowledge test). The attention check was "this is an attention check, please select "very true for me."" Participants also indicated their race in our study; 3 participants were excluded for not self-identifying as European American. 239 participants were thus analyzed (36% female, 64% male; age M = 37.41, SD = 11.76).

462 Japanese participants were recruited through Lancers, an online crowdsourcing marketplace in Japan. 108 participants were excluded for not having enough baseball knowledge or failing the attention check (102 failed the baseball knowledge test, 13 failed the attention check, 7 failed both). 5 participants were excluded for not indicating Asian as their ethnicity, leaving 349 respondents for analysis (36% female, 64% male; age M = 41.45, SD = 9.61).[6]

Procedure. After consenting, participants completed a questionnaire measuring their motivational orientations (see Appendix B for all items) and were then presented with the attention check and questions about baseball rules to determine eligibility. Eligible participants then answered questions regarding baseball scenarios, reported demographics

[6] Using the average of the effect sizes found (.25) during pilot study (see Appendix), we conducted an a priori power analysis (two tailed, $\alpha = .05$). To achieve power of .80 would require 120 participants. Given less familiarity with Japanese participants' characteristics, we set out to collect data from 200 Americans and 200 Japanese, which would allow us to detect an effect size of .20 between approach/avoidance motivation and baseball strategic decision-making. Although we pre-registered for 200 Americans and 200 Japanese, we collected data from more participants to have sufficient sample size given exclusion criteria. Data analysis did not occur until all data were collected. (The effect size differs slightly from the effect size (.23) in our pre-registration which was based on a calculation error. Nevertheless, the targeted sample size was exactly as pre-registered as we intended to oversample a priori.

(see Appendix C for demographic questionnaire), and were debriefed.

Measures and Materials

An online survey titled "Short baseball study" presented items in the following order. The survey was translated into Japanese for Japanese participants.

Approach and avoidance motivation. A 20-item Behavioral Inhibition and Behavioral Activation Scale (Carver & White, 1994) was used to assess participants' approach (BAS) and avoidance (BIS) motivational orientations. Items were assessed on a 4 point scale, from 1 "very false for me" to 4 "very true for me." Thirteen items measured approach motivation, e.g. "I go out of my way to get things I want." (Japan: $\alpha = .83$; US: $\alpha = .86$). Seven items measured avoidance motivation, e.g., "I worry about making mistakes." (Japan: $\alpha = .85$; US: $\alpha = .86$). A multigroup confirmatory factor analysis examined measurement invariance regarding the BIS/BAS scales across the two groups (see Appendix A). For both BIS and BAS, evidence of configural and metric invariance was found, demonstrating measurement equivalence.

Baseball knowledge qualification check. Three items assessed participants' baseball knowledge: 1) "How many innings are there in a MLB (NPB) game?" 2) "How many balls are required to walk a batter?" and 3) "How many outfielders per team are there in a typical baseball game?"

Strategic Decision Index. Participants then read eight baseball scenarios in randomized order, and were given two strategic choices for each scenario. One option was higher risk-higher payoff and the other was lower risk-lower payoff, and these scenarios were constructed based on likely outcomes of strategies and confirmed with a pretest in the U.S. and Japan (see Table 1.1 for all scenarios and Appendix A for pretest details). We created a

composite, the Strategic Decision Index (SDI), by summing the choices of eight scenarios to indicate participants' tendencies to make more high risk-high payoff or low risk-low payoff decisions. The SDI ranged from 0 to 8, with higher numbers indicating a participant chose more high risk-high payoff strategies, and lower numbers indicating a preference for more low risk-low payoff strategies.

Table 1.1. S*trategic Decision Index.*

Baseball scenario	High risk-high payoff	Low risk-low payoff
A. It's the bottom of the eighth inning, and your team is losing by one. One of your teammates is on third base, it's 1 out and you are at bat. The pitch count is 2-1. Would you try to swing for a home run so your team could be in the lead, or try to bunt so your team can score a run and tie the game?	I would try to swing for a home run.	I would try to bunt.
B. Imagine you are the coach and it's the bottom of the eighth inning. Your runner on first base has average performance in stealing. Your team is down by 1 run, and there are 2 outs. If the runner attempts to steal a base but fails, the inning will end; if the steal succeeds, the runner will be in scoring position, and your team will need just one hit to score. Would you have the runner attempt to steal or not?	Yes, I will have the runner attempt to steal.	No, I will not have the runner attempt to steal.
C. You are at bat, your teammate is on first base with 1 out. The pitch count is 3-0. Your coach just gave you a green light. Would you take the pitch or try to swing?	I would try to swing.	I would take the pitch.
D. Imagine you are the centerfielder. It's the bottom of the 8th inning with 1 out. Your team is winning by 1 run. Your opponent has runners on second and third base. The batter hits a fly ball and it is about to land between you and the infield. Would you wait for the ball to drop for a hit (meaning a run will score) or try to dive for the ball to make an out (with the possibility that you will miss it and the opponent will score 2 runs)?	Try to dive.	Wait for ball to drop.
E. Imagine you are the third-baseman. It is the bottom of the 8th inning with 2 outs and 1 runner on second base. Your opponent hits a ground ball and it rolls along the third base line. Would you run to the ball and throw it to first base attempting to get the batter out (with the possibility that you might not throw the ball in time, or wild throw, which could allow your opponent to score) or would you wait for the ball to roll outside the line so it counts as a foul ball (with the possibility that it stays within the line, which would be a hit but your opponent would not advance from second to third base)?	I would run to the ball and throw it to first base attempting to get the batter out.	I would wait for the ball to roll outside the line so it counts as a foul ball.
F. Imagine you are the coach. It's the top of the 7th inning with 1 out, and there is 1 runner on second base.	Ask pitcher to face the batter.	Ask pitcher to intentionally walk.

The next batter has two hits in the game and is a .320 batting average. Would you ask your pitcher to intentionally walk the batter (intentional base on balls to create an opportunity for double-play) or would you let the pitcher face the batter?		
G. Imagine you are the third base coach. It's the bottom of the 8th inning, and your team is losing by 1. Your runner is on third base with 1 out and your batter hits a fly ball to right field. The outfielder who has a strong arm makes the catch – would you tell your runner to tag up and try to run home or tell the runner stay on third base?	I would tell the runner to tag up and try to run home.	I would tell the runner to stay on third base.
H. Imagine you are the catcher. Your opponent has a runner on first and a runner on third base. The runner on first base is trying to steal. Would you throw to second base to try and tag the runner out (at the risk of the runner on third base stealing home), or would you not throw to second base (no out and no risk of runner on third base stealing home)?	I would throw to second base to try and tag the runner out.	I would not throw to second base.

Results

Cultural Differences in Strategic Decision-making

To examine whether culture influenced strategic decision-making, we conducted a regression analysis, with culture (effect coded: Japan = -1 vs. US = 1) as the predictor and SDI as the outcome variable. There was a significant cultural difference between Japanese (M = 3.65, SD = 1.57) and European Americans (M = 3.95, SD = 1.52) in the number of high risk-high payoff versus low risk-low payoff strategic decisions β = .10, b = 0.15, SE = 0.07, p = .020, 95% CI = [.02, .28], Cohen's d = 0.19. European Americans made more high risk-high payoff decisions than Japanese did, and Japanese made more low risk-low payoff strategic decisions than did European Americans. Examining each scenario using χ^2 analysis revealed that 4 of the 8 were significant or marginal in the predicted direction, whereas 2 of the 8 were significant in the counter-predicted direction. (See Table 1.2 for the frequency breakdown).

Table 1.2.

Frequency breakdown of each Strategic Decision Index scenario.

Scenario	Japan/US	Low risk-low payoff	High risk-high payoff	Chi-square p-value (one tailed)
A	Japan	84.2%	15.8%	.001
	US	72.8%	27.2%	
B	Japan	37.2%	62.8%	.016
	US	46.4%	53.6%	
C	Japan	78.2%	21.8%	< .001
	US	55.6%	44.4%	
D	Japan	35.8%	64.2%	.059
	US	29.3%	70.7%	
E	Japan	43.0%	57.0%	.365
	US	44.8%	55.2%	
F	Japan	51.6%	48.4%	.036
	US	59.4%	40.6%	
G	Japan	41.5%	58.5%	.482
	US	41.0%	59.0%	
H	Japan	63.6%	36.4%	.032
	US	55.6%	44.4%	

Note. Using one-tailed χ^2 analysis, we found that four scenarios were in the predicted direction (A, C and H were significant, D was marginal). Two scenarios were significant and in the opposite direction (B and F). Two scenarios showed no difference (E and G).

Cultural Differences in Motivational Orientation

We then investigated whether there were cultural differences in approach and avoidance motivation. Japanese (M = 3.08, SD = 0.53) scored higher on avoidance motivation than European Americans did (M = 2.81, SD = 0.67), β = -.22, b = -0.13, SE = 0.03, p < .001, 95% CI = [-.18, -.08], Cohen's d = 0.45. European Americans (M = 2.92, SD = 0.48) scored higher on approach motivation than did Japanese (M = 2.78, SD = 0.38), β = .15, b = 0.07, SE = 0.18, p < .001, 95% CI = [.03, .10], Cohen's d = 0.32.

Motivational Orientations Underlies Cultural Differences in Strategic Decision-making

To examine whether approach and avoidance motivation explained the cultural differences in strategic decisions, we conducted a series of regression analyses, with culture (effect coded: Japan = -1 vs. US = 1) as the predictor, approach and avoidance motivation as

mediators, and SDI as the outcome variable. The first two steps of the mediational analysis are presented above, with culture significantly predicting SDI, and culture significantly predicting approach and avoidance motivation.

Then, we regressed SDI on culture, avoidance and approach motivation simultaneously (see Appendix A for additional analyses looking at avoidance and approach motivation separately and Table 1.3 for the correlation among key variables). Both avoidance (β = -.11, b = -0.28, SE = 0.11, p = .009, 95% CI = [-.49, -.07]) and approach motivation (β = .12, b = 0.44, SE = 0.15, p = .003, 95% CI = [.15, .73]) significantly predicted the SDI. As expected, the association between culture and the SDI observed in the first equation became non-significant, β = .05, b = 0.08, SE = 0.07, p = .205, 95% CI = [-.05, .22]. To test the indirect effect of mediation, we used PROCESS Model 4 (Hayes, 2018). Results showed that the indirect effect of culture on SDI through avoidance and approach motivation was significant, b = .07, SE = 0.02, 95% CI = [.03, .11]). This suggested that avoidance and approach motivation combined to explain the cultural difference in strategic decision-making (see Figure 1.4).The indirect effect of culture on SDI through avoidance motivation was significant, b = .04, SE = 0.02, 95% CI = [.01, .07]), as was the indirect effect through approach motivation, b = .03, SE = 0.01, 95% CI = [.01, .06]). In sum, cultural differences in strategic decision making were predicted by the stronger avoidance motivation among fans from Japan and stronger approach motivation among fans from the US.

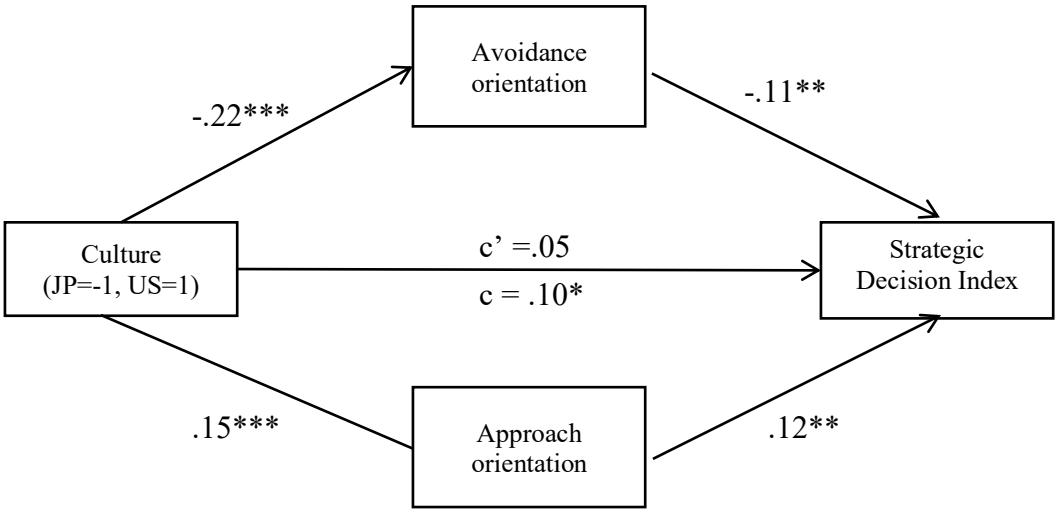

Figure 1.4. Coefficients are standardized, ***$p < .001$, **$p < .01$, *$p < .05$.

Table 1.3.
Point Biserial Correlation table of BIS, BAS and each Strategic Decision Index Scenario (high risk-high reward option was coded as 1; low risk-low reward option was coded as 0 in each scenario).

Scenario	BIS/BAS	Japan+US	Japan	US
A	BIS	-.127**	-.101	-.100
	BAS	.089*	.076	.062
B	BIS	-.023	-.067	-.018
	BAS	.103*	.124*	.114
C	BIS	-.056	-.037	.027
	BAS	.095*	.085	.036
D	BIS	-.048	-.053	-.013
	BAS	.078	.023	.126
E	BIS	-.050	.012	-.134*
	BAS	-.024	-.035	-.005
F	BIS	-.013	-.015	-.049
	BAS	-.035	-.017	-.032
G	BIS	-.027	-.017	-.039
	BAS	.068	.110*	.019
H	BIS	-.075	-.026	-.097
	BAS	.067	.086	.023

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

Chapter 1 Discussion

Two studies highlight culture-specific ways in which people assess tradeoffs between potential risks and payoffs. Using archival data from professional baseball leagues, we

observed systematic differences in real and consequential decision-making between approach and avoidance oriented cultures. Assessing fans' responses to baseball scenarios, we found a consistent pattern such that Japanese chose low risk-low payoff strategies more than did European Americans, and European Americans chose high risk-high payoff strategies more than did Japanese. We also identified a mechanism as motivational orientation mediated the impact of culture on strategic decision-making.

Theoretical and Practical Implications

The present studies sought to understand the real-life implications of cultural differences in basic psychological orientations within a concrete decisional context. Such research provides a pathway from basic research to understanding how psychology and behavior unfold in real-life situations. When contemplating different options, what is an obviously superior choice to one person might not be so obviously superior to others. Culture influences those judgments about potential risks and benefits by determining where the balance point is. Understanding underlying psychological factors driving decision-making processes of people from different cultures can lead to identifying solutions that are satisfactory to both parties in inter-cultural negotiations.

Our research also informs how individuals make decisions and how they assess potential gains and losses in general. Finding consistency between players (Study 1) and fans (Study 2) suggests that players may be responding to intersubjective norms (Chiu et al., 2010). How individuals determine their goals and choices may be influenced by the way others respond to them. Focusing on avoidance goals may be a better strategy for people from collectivistic cultures where their relationships are viewed as stable and with low mobility; emphasizing approach goals may be a better strategy for people from

individualistic cultures where their relationships are viewed as malleable and with high mobility (Adams & Plaut, 2003; Yuki & Schug, 2012). Goals in turn, could drive how people make decisions.

Beyond sports, the present research has broader implications for other important domains to study strategic decision making, such as business settings. Research has found in entrepreneurial settings that a stronger cultural value of uncertainty avoidance and power distance was associated with reduced risk-taking behavior (Kreiser et al., 2010). Cultural differences in motivational orientations may also underlie such variations in financial risk-taking. Future research could examine how cultural variance in psychological factors explains the differences in people's investment or negotiation strategies between cultures.

Limitations and Future Directions

Study 1 examined actual behavior, but as with many archival studies, there are alternative interpretations. Physical size or strength is likely to also play a role in explaining the cultural differences found in Study 1. Study 2 showed that cultural differences in motivation orientation play a role in explaining cultural differences in strategic decision making. Study 2 also enabled greater control over stimuli and the sample and thus this methodology enabled us to examine a culturally shared view across different situations. Yet, a limitation of Study 2 is its use of hypothetical strategic decision items where the stakes were low, and the effect sizes were relatively small. One reason why the effect size in Study 1 may have been larger than Study 2 is that Study 1 focused on actual behaviors among people engaged in consequential actions, whereas in Study 2, participants made judgments about hypothetical events. The difference in effect size is consistent with a meta-analysis by Morling and Lamoreaux (2008; Lamoreaux & Morling, 2012) that shows how effect sizes for

cultural products are consistently larger than self-report measures of the same construct. With baseball as a cultural product, the present study adds to the literature on how cultural differences manifest themselves across behavioral indicators and self-report judgments.

Past research has shown that as the distance to their goal decreases, people's motivation to reach the goal becomes stronger, also referred to as the "goal gradient hypothesis". This phenomenon applies to both approach and avoidance motivations (e.g. Touré-Tillery & Fishbach, 2011; Brown, 1948; Förster et al., 1998). Therefore, I expect players' motivations to become stronger when the game is about to end, or when playing in the playoffs compared to the regular season. Future research may investigate whether the cultural differences in strategy preferences would be larger in latter (7-9) innings compared to the earlier innings (1-3 innings), or larger in the playoffs compared to the regular season.

Cultural differences in risky decision-making are determined by multiple psychological factors. We focused on approach/avoidance motivation because it is theorized to predict action in immediate and uncertain situations (Elliot & Gable, 2019). Yet other psychological factors are clearly relevant to culture and decision making. The strong focus on interdependence in Japanese culture and the strong focus of independence in American culture may play a role in driving preferences for different strategies. For example, a home run can be viewed as a demonstration of personal strength and success, and resonate with Americans' more independent sense of self; bunting may demonstrate self-sacrifice and valuing team success over personal achievement, and therefore may resonate with the more interdependent sense of self of Japanese. Cultural differences in optimism bias, the belief of people that they are more likely to experience positive events and less likely to encounter negative events than similar others (Weinstein, 1980), may also relate to how people make

risky decisions, and are likely intertwined with approach-avoidance orientation. One who is more optimistic is likely to be approach orientated, and a culture that fosters self-serving tendencies is likely to foster greater optimism (Heine & Lehman, 1995). Cultures with high individualism have people who exhibit greater optimism bias (Antonczyk & Salzmann, 2014). People from more individualistic cultures may thus perceive that their risk taking is more likely to bring a favorable outcome than do people from more collectivistic cultures, and this culturally shared perception may also contribute to their risk-taking.

Conclusion

Winning is the goal in both American and Japanese baseball, but there are cultural differences in the ways that Americans and Japanese, players and fans, pursue this goal through the strategies they choose. A psychological difference in motivational orientation appears to underlie these cultural differences in strategic decision-making. Cultures seem to influence not only whether people prefer Cracker Jacks or rice balls, but also their preferred way to compete in their games.

Chapter 2

Socioeconomic Status and Decision Making among College Students

There has been a rising percentage of undergraduates from low-income families in the past two decades (Fry & Cilluffo, 2019). This trend is especially encouraging given that attending college has been identified as one of the best ways to "climb up the ladder" (Yount, 2014; Pew Charitable Trust, 2012). Nine out of ten children who grew up at the bottom of the income ladder and graduated from college moved up to a higher economic bracket as adults, while only less than half of the children without a degree were able to do so (Pew Charitable Trust, 2012). Having a college degree made a person more than three times likely to jump from the bottom of the family income ladder all the way to the top (Pew Charitable Trust, 2012). Therefore, getting a college degree is crucial to gaining higher socio-economic status.

While more students from lower class families are attending colleges, and college education aids in the economic success of students, not all students are equally successful during college or benefit equally from college degrees. Studies showed that students from wealthier families were more likely to graduate than students from low-income families (Bailey & Dynarski, 2011). In fact, students from high income families who scored poorly on standardized tests were just as likely to graduate as students from low-income families who got high scores on standardized tests (Gould, 2012). Further, among Master's and Bachelor's degrees graduates, being from higher socioeconomic backgrounds predicted higher current salaries, while GPA did not (Pfeffer, 1977). Another study also found that among MBA graduates, women who grew up in higher social classes had higher starting salaries (Frieze et al., 1990). While acknowledging the roles that structural factors such as unequal access to jobs may play in these findings, individuals' decision-making tendencies may also be a

contributor. These findings suggest that work is needed to better understand the experiences and challenges of lower income college students in order to help them reach their potential during and after college.

Life in college encompasses a series of decision-making opportunities, from choosing what clubs to join to figuring out what major to study. Some of these decisions may seem minor, however, each decision contributes to students' experience in its unique way. One of the factors that may help explain the socioeconomic differences in college graduation rate and starting salary may be how students of varying socioeconomic status approach decision-making differently. My research aims to examine how college students' socioeconomic status drives their decision-making processes and strategies in school and in job-seeking domains.

Socioeconomic Status and Decision-making

The material conditions which people grow up and live in have a lasting impact on their identities, which influences the way they think, feel and interact with their social environment (Manstead, 2018). These differences can be reflected in the ways in which people make decisions. Middle/upper class individuals, with greater access to economic capital and higher status (Pascarella & Terenzini, 1991; Day & Curry, 1998), are more able to make choices consistent with their preferences, influence others' opinions and fulfill own interests with their decisions (Stephens et al., 2014). On the other hand, lower/working class individuals, with limited resources and harsher living environments, are more sensitive to the way external variations shape others' emotions (Kraus et al., 2010; Manstead, 2018) and are more interdependent since social relationships are crucial to their survival and success (Stephens et al., 2014; Adams, 2005; Kim & Lawrie, 2019). These factors associated with lower/working class individuals being more prosocial and more empathetic when making

decisions in daily life relative to higher class individuals (Kraus et al., 2010; Piff et al., 2010). Despite having less financial resources, lower class individuals showed greater support for charity than their higher class counterparts (Piff et al., 2010). In another respect, lower class individuals were more likely to make decisions that harm their long-term life outcomes in important domains like health (Pampel et al., 2010). This may be attributed to their tendency to focus on present (over future) goals and seek immediate gratification, due to resource scarcity and environmental instability (Griskevicius et al., 2011; Sheehy-Skeffington, 2020). These studies suggest that socioeconomic status has strong influences on the way people make decisions.

In this chapter, socioeconomic status is measured with the MacArthur Scale of Subjective Social Status (Adler & Stewart, 2007), a subjective assessment of socioeconomic status. This subjective socioeconomic status scale provides a summative measure of social status because it allows participants to consider indicators such as education, family income, occupation, other assets etc., whereas more objective socioeconomic status measures like family income only focuses on one aspect (Adler & Stewart, 2007). Further, objective socioeconomic status like income or education may not reflect how a person actually feels about where they stand in society. For example, an annual personal income of $50,000 may be high in some cities, but puts people below the “Low Income Limits” in San Francisco (City Performance Scorecards, 2018). Having a college degree may feel different for people who work with colleagues with graduate degrees versus high school diplomas. Therefore, the feeling of having scarce/abundance resources and one’s standing in the society may be better captured by subjective socioeconomic status rather than objective measures.

Socioeconomic Status, Motivation and Risk-taking

One of the main differences in decision-making among people of varying socioeconomic status is their risk-taking propensity. Past studies found that lower socioeconomic status was predictive of risk aversion (e.g. Guiso & Paiella, 2008; Haushofer & Fehr, 2014; Wik et al., 2004). For example, having little financial resources causes stress and negative affect, which might lead to favoring habitual behaviors at the expense of goal directed behaviors, causing risk-averse decision-making (Haushofer & Fehr, 2014). In addition, a number of studies suggested that negative income shocks, such as money being taken away and global economic crisis, experienced by participants were also associated with risk aversion (Paravisini et al., 2017; Thaler & Johnson, 1990). This association may be due to differences in approach and avoidance motivations among people of varying socioeconomic status.

Approach motivation drives people to behave in order to obtain a positive/desirable outcome, whereas avoidance motivation drives people to act in order to avoid a negative/undesirable outcome (Elliot, 1999a; Elliot et al., 2001). Middle/upper class individuals, with greater access to economic capital and higher status (Mireles-Rios & Romo, 2010; Pampel et al., 2010) has higher outcome expectancy — the belief that they could reach their desired outcomes (Schnelle et al., 2010). Therefore, they are more approach orientated and are more willing to take risks (e.g. Diener & Fujita, 1995; Elliot & Church, 1997; Schnelle et al., 2010, Haushofer & Fehr, 2014; Wik et al., 2004). On the other hand, lower class individuals with limited resources and harsher living environments, has lower outcome expectancy. The less likely one believes they would reach their goals, the more salient the potential of failure, which drives lower class individuals to be more avoidance oriented and

be less willing to take risks (e.g. Bandura, 1977, 1990; Schnelle et al., 2010; Haushofer & Fehr, 2014; Wik et al., 2004). This proposed association between socioeconomic status, approach/avoidance motivation and risk-taking is in line with uncertainty management strategy (Amir et al., 2018). According to uncertainty management framework, when in an environment where resources are scarce and uncertainty is high, which are the characteristics of a lower socioeconomic status environment (Amir-ud-Din et al., 2018), taking sure gains when they are available would be preferred to gambling with uncertain outcomes, even if the outcome may yield a higher value. In other words, if you cannot afford the bad outcome (to lose), avoid uncertainty and do not take the risk (Amir et al., 2018), which is consistent with the characteristic of a strong avoidance motivation — avoid negative outcome (Elliot, 1999a; Elliot et al., 2001).

In addition, the ways people from varying socioeconomic classes form and maintain social relationships may also help explain the differences in their motivational orientations. Being in lower/working class fosters a stronger interdependent self-construal as people need to rely on others' support; being in middle/upper class fosters a stronger independent self-construal, as people have more available resources and do not need to rely on others as much (Stephens et al., 2014; Freeman, 1997; Snibbe & Markus, 2005). Previous research has also shown that people with stronger interdependent self-construal are more avoidance oriented (Elliot et al., 2001) as the cost of losing a connection is high and maintaining relationships is crucial to survival, putting people in a relatively powerless state (Adams, 2005; Kim, Sherman, & Taylor, 2008; Kim & Lawrie, 2019; Keltner et al., 2003). On the other hand, people with stronger independent self-construal are more approach oriented, since the cost of losing a relationship is relatively low and forming new relationships is beneficial, putting

individuals in a more powerful state (Kim & Lawrie, 2019; Keltner et al., 2003). Therefore, people from lower socioeconomic backgrounds are more likely to have a stronger inhibition/avoidance tendency (Lochbaum et al., 2020), which means that they act with the goal to prevent undesired or negative outcomes and are more risk averse (e.g. Elliot, 1999; Haushofer & Fehr, 2014; Wik et al., 2004). On the other hand, people from higher socioeconomic backgrounds are more likely to have a stronger approach tendency, which means that they behave with the goal to achieve desired outcomes and are more willing to take risks (e.g. Elliot, 1999; Haushofer & Fehr, 2014; Wik et al., 2004).

The risk aversion effect discussed above — preferring sure gain over high outcome variance with potential higher expected value — has to be distinguished from engaging in risky behaviors — engaging in activities that may provide immediate gratification, but lead to undesirable outcomes, such as having unprotected sex or taking illegal drugs. Individuals from lower socioeconomic status were more likely to engage in risky behaviors (e.g. Baumer & South, 2001; Chen et al., 2010; Williams & Latkin, 2007), which was likely due to higher mortality and resource scarcity in their environment (Griskevicius et al., 2011; Roff, 1994). My research is interested in risk-taking under uncertainty, where the outcome is unclear, and the cost and gain could be financial, social, psychological, academic etc., rather than the general risky behavior for immediate payoff with clear negative consequences on health and safety.

Overview

The goal of Study 1 was to examine whether socioeconomic status was associated with decision-making processes and strategies among college students. Further, it investigated whether approach and avoidance motivations explained this relationship.

Drawing from previous research, I expected that when college students are making decisions, those coming from lower socioeconomic status would show a stronger concern for loss/negative outcome, and people from higher socioeconomic status would have a stronger focus on gain/positive outcome. When faced with risky decision-making, low risk-low payoff options that minimize the risk of failure would be more utilized among college students from lower class backgrounds, and that high risk-high payoff options that maximize the potential of reward would be more utilized among college students from higher class backgrounds. Furthermore, I predicted that these differences in decision making processes and strategies would be partly explained by socioeconomic differences in approach and avoidance motivations.

Study 2 experimentally manipulated message framing to examine whether the effectiveness of message depended on the framing as well as the students' socioeconomic status. While both messages advocated for the same beneficial behavior for college students — interactions with instructors, they differed in their gain vs. loss framing. Drawing from previous research, I hypothesized that people of higher socioeconomic status will engage in more academic related interactions. Furthermore, this relationship would be strengthened if participants were presented with the gain framed flyer promoting academic interactions, but weakened if participants were presented with the loss framed flyer promoting academic interactions. The rationale was that gain framed messages, aligning more with approach motivation, would be more effective for individuals from higher socioeconomic status; while loss framed messages, aligning more with avoidance motivation, would be more effective for individuals from lower socioeconomic status . I hoped to demonstrate that simple interventions such as message framing could promote behaviors that lead to better outcomes

in college. This could have an impact on helping students from lower socioeconomic backgrounds succeed in college.

Study 1

Study 1 aimed to investigate whether socioeconomic status predicted decision making strategies and processes among college students. In addition, it examined whether this relationship would be explained by approach and avoidance motivation. To assess decision-making strategies, participants were presented with risky decision making-scenarios related to job seeking. To assess decision-making process, participants also responded to an open-ended question regarding the main reason they made each decision. I hypothesized that when making decision under uncertainty, lower socioeconomic status would predict a stronger concern about loss/negative outcome in the decision-making process and a preference for lower risk-lower payoff decisions, while higher socioeconomic status would predict a stronger focus on gain/positive outcome in the decision-making process and a preference higher risk-higher payoff decisions. Furthermore, approach and avoidance motivation would mediate these associations (see Figure 2.1 for proposed model). To analyze decision-making processes, participants' open-ended responses would be categorized into different word groups by a text analysis software. I expected that lower socioeconomic status individuals would use more words reflective of concern about loss/negative outcome (avoidance motivation), such as negation (e.g. no, not, never etc.), discrepancy (e.g. should, would, could etc.), differentiation (e.g. hasn't, but, else etc.), risk (e.g. danger, doubt) and negative emotions (e.g. hurt, sad etc.) words. Higher socioeconomic individuals would use more words reflective of placing emphasis on gain/positive outcome (approach motivation), such as drives (e.g. achieve, power, reward etc.), achievement (e.g. win, success, better etc.),

power (e.g. superior, bully etc.), reward (e.g. take, prize etc.), and positive emotions (e.g. love, happy etc.) words.

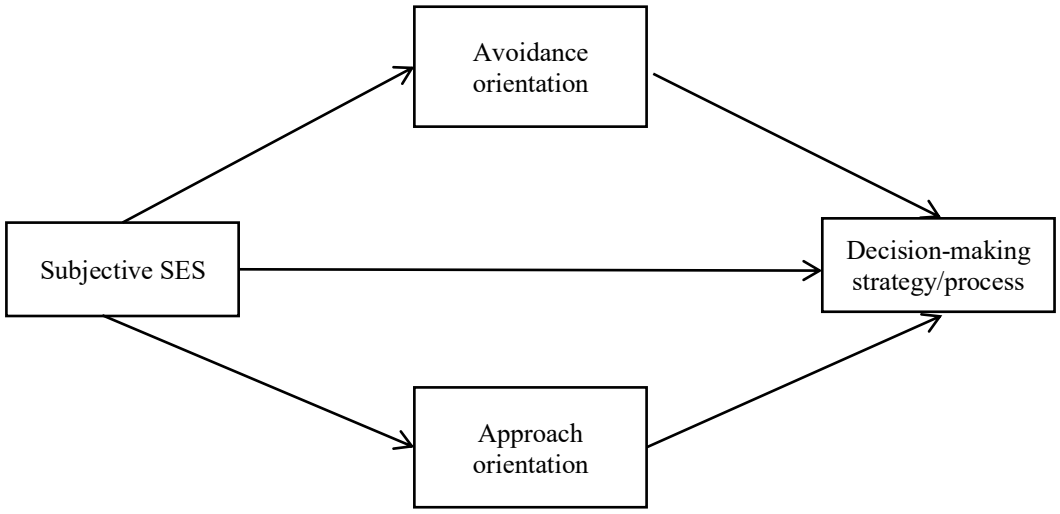

Figure 2.1. Proposed mediation model of subjective SES predicting decision-making strategy or process mediated by approach and avoidance motivations.

Method

Participants

Three hundred and twelve college students (62% female, 37% male; M_{age} = 22.43; 54% White, 18% Black, 14% Latinx, 9% Asian, 5% Other) were recruited Amazon Mechanical Turk (www.mturk.com; Buhrmester et al., 2011), as the decision domain I was interested in was highly relevant to college students. The sample size was determined through power analysis, using the effect size (r = .17) of correlation found between socioeconomic status and "discrepancy" (word category generated by LIWC, a text analysis software) in the preliminary data, which was an important finding in the correlations between socioeconomic status and a word category representing decision-making process. To detect an effect size of .17, at α = .05 (two tailed) with .80 power, I would need 266 participants. Therefore, I aimed to recruit about 300 participants.

Measures and Procedure

After providing consent, participants received the study materials in the following order:

Approach and avoidance motivation. A 20-item Behavioral Inhibition and Behavioral Activation Scale (Carver & White, 1994) was used to assess participants' approach (BAS) and avoidance (BIS) motivational orientations (see Appendix B for all items). Items were assessed on a 4 point scale, from 1 "very false for me" to 4 "very true for me." Thirteen items measured approach motivation, e.g. "I go out of my way to get things I want" (M = 3.05, SD = 0.41, α = .81). Seven items measured avoidance motivation, e.g., "I worry about making mistakes" (M = 3.15, SD = 0.54, α = .77).

Achievement goals. A 12 item Scale (Elliot, 1999b; Elliot & McGregor, 2001) was used to assess participants' mastery-approach, mastery-avoidance, performance-approach, and performance-avoidance goals (see Appendix D for all items). Items were assessed on a 7-point scale, from 1 "not at all true of me" to 7 "very true of me." Each construct was measured with three items. For example, "This upcoming semester/quarter, I want to learn as much as possible" assessed mastery-approach goals (M = 5.77, SD = 1.19, α = .84); "My goal this upcoming semester/quarter is to avoid learning less than I possibly could" assessed mastery-avoidance goals(M = 5.16, SD = 1.38, α = .72); "This upcoming semester/quarter, I want to do well compared to other students" assessed performance-approach goals (M = 5.35, SD = 1.44, α = .86); "This upcoming semester/quarter, it is important for me to avoid doing poorly compared to other students" assessed performance-avoidant goals (M = 5.55, SD = 1.34, α = .83).[7]

[7] To examine the relationship between achievement goals and subjective socioeconomic status, avoidance motivation, approach motivation and risk-decision making strategies, I conducted Pearson correlation analyses.

Risky decision-making. Risky decision-making was assessed with two scenarios. The first was a job interview scenario — "Imagine that you are about to graduate and are applying for jobs. During a job interview, you are asked what your expected salary is. (Note: The range of income for college graduates' first full-time job is typically $35,000-$75,000. If two candidates are equally qualified, the employer may be more inclined to hire the person who demands a lower salary.) What would you say your expected salary is?" They were given a slider ranging from $0 to $150,000. Demanding a higher salary was a riskier choice (may not get an offer) with potential higher payoff (higher salary) (M = 55,500, SD = 13,400).

The second scenario was a job certificate scenario — "Imagine that you need a certificate in order to be eligible for jobs that you are interested in. There are two certificate programs to choose from and you only have the financial resources and time to participate in one program. One program is known to be challenging, and 40% of people who participate in the program are able to finish it and receive the certificate (average salary $55,000). If you succeed in this program, it will strengthen your resume and make you a strong job candidate. Another program is known to be easy, and 80% of people who participate in the program are able to finish it and receive the certificate (average salary $49,000). If you succeed in this program, it will make you eligible for the positions you are interested in, but you may not be as competitive as those who completed the more challenging program. Which program

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Subjective SES was not associated with mastery-approach, mastery-avoidance, performance-approach, or performance-avoidance goals. All four achievement goals significantly positively associated with both avoidance (BIS) and approach (BAS) motivations. All four achievement goals positively (3 significant, 1 marginal) associated with expected salary in the job interview scenario, and negatively associated (all significant) with program choice in the job certificate scenario. The higher the four goals, the higher the listed expected salary and the more likely the participants chose the challenging (high risk-high payoff) program. These correlations suggested that achievement goals did not capture the difference in avoidance and approach goals that I had expected. Therefore, they were not analyzed further in the results section.

would you choose to attend?" The more challenging certificate program was the riskier choice (lower chance of passing), with potential higher payoff (higher chance of getting hired and higher salary). The challenging program was coded as 1 and the easier program was coded as 2 (challenging: 57.7%, easy: 42.3%).

In addition, to assess decision-making processes, an open-ended question "What was your main reason for choosing [insert participant's response]? Please describe your reason in one sentence by typing in the space below." followed each of the scenarios.

Subjective socioeconomic status (subjective SES). Participants' socioeconomic status was measured with the MacArthur Scale of Subjective Social Status (Adler & Stewart, 2007). The SES ladder provides a summative measure of social status because it instructed the participants to summate across indicators such as education, individual/family income, occupation and wealth etc. instead of focusing on one specific aspect. Each person may assign different weights to the various components of SES (Adler & Stewart, 2007). Further, research suggested that the subjective SES provides a better assessment of a person's future prospects, opportunities, and resources than objective SES (Singh-Manoux et al., 2005). Participants read "Think of this ladder as representing where people stand in your country. At the **top** of the ladder are the people who are the best off -- those who have the most money, the most education and the most respected jobs. At the **bottom** are the people who are the worst off -- who have the least money, least education, and the least respected jobs or no job. The higher up you are on this ladder, the closer you are to the people at the very top; the lower you are, the closer you are to the people at the very bottom. Where would you place yourself on this ladder?" Each rung of the ladder corresponds with numbers from 1 through 10. If participants placed themselves on the very bottom rung, their response is scored as 1. If

they placed themselves on the very top rung, their response is scored as 10 (M = 5.62, SD = 1.77).

Demographic information. Participants filled out demographic information (see Appendix E) such as gender, age, ethnicity, political ideology, and objective socioeconomic status (i.e., parental education and family income). Family income was measured by asking "What is your average family annual income in the past 5 years?" Participants were given 11 options ranging from under $19,999 to $200,000 or more. Each income category had a range of $19,999. On average, participants' family income fell in the $60,000 - $79,999, while the median was in the $40,000 - $59,999 category.

Participants were then debriefed about the study.

Results

Pre-test

We pre-tested the risky decision-making scenarios. The pre-tests were conducted by first introducing approach and avoidance motivations to the participants. They read the passage "Approach motivation indicates a tendency to move toward (or maintain contact with) a desired/positive stimulus. For example, I study hard to get a good grade is approach motivation. Avoidance motivation indicates a tendency to move away from (or maintain distance from) an undesired/negative stimulus. For example, I study hard to avoid getting a bad grade is avoidance motivation." We then randomly assigned participants to read "Tim is a person with a strong approach (or avoidance) motivation, please answer the following 2 questions about his decision making." Afterwards, participants were presented with scenarios involving Tim, and asked to make decisions based on Tim's motivational orientation (e.g., "Imagine that Tim needs a certificate in order to be eligible for jobs that he

is interested in. There are two certificate programs to choose from and Tim only has the financial resources and time to participate in one program. One program is known to be challenging, and 40% of people who participate in the program are able to finish it and receive the certificate (average salary $55,000). If Tim succeeds in this program, it will strengthen his resume and make you a strong job candidate. Another program is known to be easy, and 80% of people who participate in the program are able to finish it and receive the certificate (average salary $49,000). If Tim succeeds in this program, it will make him eligible for the positions he is interested in, but he may not be as competitive as those who completed the more challenging program. If Tim were choosing consistent with his approach (or avoidance) motivation, which program would Tim choose to attend?" and "Imagine that Tim is about to graduate and is applying for jobs. During a job interview, Tim is asked what his expected salary is. (Note: The range of income for college graduates' first full time job is typically $35,000-$75,000. If two candidates are equally qualified, the employer may be more inclined to hire the person who demands a lower salary.) If Tim were making decisions consistent with his approach (or avoidance) motivation, what would Tim say his expected salary is?").

We asked the participant to take a third person's perspective because we wanted to minimize the effect of the participant's own motivational orientation on their responses. We expected that those who read Tim is a person with strong approach (or avoidance) motivation would be more likely to make high risk-high payoff decisions by choosing the challenging program and listing a higher salary (or low-risk-low payoff decisions by choosing the easy program and listing a lower salary) for Tim accordingly. A chi-square test of independence was performed to examine the relation between approach/avoidance motivation and choice of

certificate program. The proportion of subjects who chose the challenging certificate program differed by the motivation condition they were assigned to, $X^2(1, N = 27) = 17.24$, $p < .001$. People assigned to approach motivation were more likely to select the challenging (high risk-high payoff) certificate program (13/13) and people assigned to avoidance motivation were more likely to select the easy (low-risk-low payoff) certificate program (11/14) (see Table 2.1). An independent sample t-test was conducted to examine whether the reported expected salary differed between participants who were assigned to approach versus avoidance motivation condition. Listing a higher (lower) expected salary is a utilizing high risk-high payoff (low risk-low payoff) strategy. Participants assigned to approach condition (M = 62098.06, SE = 6399.36) reported $18559.97 higher in expected salary than those assigned to avoidance condition (M = 43538.09, SE = 1639.27), t (25) = 2.355, p = .027. The pretest suggested that both scenarios were effective.

Table 2.1.
Frequency breakdown of job certificate scenario pre-test.

Scenario	Approach /Avoidance	High risk-high payoff	Low risk-low payoff	Chi-square p-value (one tailed)
Certificate	Approach	13	3	<.001
	Avoidance	0	11	

Subjective SES Predicted Risky Decision-making in Job Interview Scenario

To examine whether subjective SES predicted risky decision-making, I conducted regression analyses, with subjective SES as the predictor and expected salary in the job interview scenario and the certificate program choice in the job certificate scenario as the outcome variable, respectively. Consistent with the hypothesis, participants' subjective SES predicted the expected salary they indicated in the job interview scenario, $\beta = .14$, b = 1724.35, SE = 687.27, p = .013, 95% CI = [372.04, .3076.67]. Students of higher subjective

SES were more likely to indicate higher expected salaries when given the job interview scenario. As subjective SES increase by one level, expected salary increased by $1724. Different from hypothesized, participants' subjective SES did not predict their choice of certificate program in the job certificate scenario (1 = challenging high risk-high payoff program, 2 = easy low risk-low payoff program), β = -.05, b = -.01, SE = .02, p = .429, 95% CI = [-.04, .02]. Participants' subjective SES did not predict their likelihood of choosing the high risk-high payoff or low risk-low payoff certificate program. Therefore, the following analyses will only focus on the expected salary in the job interview scenario as the risky decision-making outcome variable.

Subjective SES Predicted Avoidance (but Not Approach) Motivation

I then investigated whether subjective SES predicted approach and avoidance motivation. Consistent with the hypothesis, subjective SES predicted avoidance motivation, β = -.12, b = -0.4, SE = 0.02, p = .037, 95% CI = [-.07, -.002]. Participants with higher subjective SES scored lower on avoidance motivation. Different from hypothesized, subjective SES did not predict approach motivation, β = .03, b = .01, SE = 0.01, p = .558, 95% CI = [-.02, .03]. (For correlations among key variables, please see Table 2.2.)

Table 2.2

Correlations among subjective SES, risky decision-making, approach/avoidance motivations and achievement goals

	1	2	3	4	5	6	7	8
1. subjective SES								
2. salary	.14*							
3. certificate	-0.5	-.14*						
4. avoidance motivation	-.12*	-.09	-.05					
5. approach motivation	.03	.16**	-.11	.13*				
6. mastery-approach goal	.08	.22***	-.22***	.26***	.33***			
7. mastery-avoidance goal	.03	.10	-.12*	.20***	.28***	.53***		
8. Performance-approach goal	-.01	.22***	-.24***	.16**	.36***	.55***	.38***	
9. performance-avoidance goal	-.07	.12*	-.21***	.26***	.33***	.48***	.49***	.75***

Note. Certificate variable is dichotomous (1 = high risk-high payoff, 2 = low risk-low payoff). Each achievement goal subscale positively correlated with each other, and positively correlated with avoidance and approach motivation. They did not seem to capture the difference between approach vs. avoidance goals, or mastery vs. performance goals. * $p < .05$, ** $p < .01$, *** $p < .001$.

Approach (but Not Avoidance) Motivation Predicted Risky Decision-making in Job Interview Scenario

Next, I examined whether approach and avoidance motivation predicted expected salary in the job interview scenario. Consistent with the hypothesis, approach motivation predicted expected salary, $\beta = .16$, $b = 8409.56$, $SE = 2920.15$, $p = .004$, 95% $CI = [2663.74, 14155.38]$. Participants with stronger approach motivations indicated higher expected salaries in the job interview scenario. Different from hypothesized, avoidance motivation did not predict expected salary, $\beta = -.09$, $b = -3477.29$, $SE = 2258.24$, $p = .125$, 95% $CI = [-$

.7920.713, .966.13].[8].

Mediation Analysis: Approach and Avoidance Motivation Did Not Explain the Association Between Subjective SES and Risky Decision-making

To examine whether approach and/or avoidance motivation explained the association between subjective SES and risky decision-making in the job interview scenario, we conducted a series of regression analyses, with subjective SES as the predictor, approach and avoidance motivation as mediators, and expected salary in the job interview scenario as the outcome variable. The first two steps of the mediational analysis were presented above, with subjective SES significantly predicting expected salary, and subjective SES significantly predicting avoidance motivation but not approach motivation. Following Baron and Kenny's (1986) causal steps approach to mediation, the proposed mediation would not be significant as one of the paths in the second step was not significant. However, I continued to run the mediation model as some newer methods suggested that regardless of whether one of the individual paths is insignificant, the indirect effect can be significant (Bolin, 2014).

Finally, I regressed expected salary in the job interview scenario on subjective SES, avoidance and approach motivation. Avoidance motivation did not significantly predict expected salary, β = -.10, b = -3782.50, SE = 2249.72, p = .094, 95% CI = [-8209.25, 644.257], but approach motivation significantly predicted expected salary, β = .17, b = 8844.20, SE = 2917.52, p = .003, 95% CI = [3103.41, 14584.99]. The association between

[8] Choice of certificate program in the job certificate scenario was not predicted by either approach, β = -.11, b = -.13, SE = .07, p = .06, 95% CI = [-.26, .01], or avoidance motivation, β = -.05, b = -.05, SE = .05, p = .363, 95% CI = [-.15, .06]. Although not significant, the association between choice of certificate program and approach motivation was marginal, where people with stronger approach motivation were more likely to choose the challenging high risk-high payoff program. I also examined whether approach and avoidance motivation interacted to predict expected salary or certificate program choice. The approach X avoidance motivation on risky decision-making strategies were not significant (salary: b = -3366.53, SE = 4208.38, p = .424, 95% CI = [-.11647.34, 4914.28]; certificate: b = -.16, SE =.41, p = .693, 95% CI = [-.96, .64]).

subjective SES and the expected salary (risky decision-making) observed in the first equation became slightly weaker, $\beta = .12$, $b = 1518.01$, $SE = 683.34$, $p = .027$, 95% $CI = [173.39, .262.62]$. To test the indirect effect of mediation, I used PROCESS Model 4 (Hayes, 2018). Results showed that the indirect effect of subjective SES on expected salary through avoidance and approach motivation was not significant, $b = 206.35$, $SE = 161.73$, 95% $CI = [-61.51, 584.28]$. This suggested that avoidance and approach motivation combined did not explain the association between subjective SES and expected salary (risky decision-making). Furthermore, the indirect effect of subjective SES on expected salary through avoidance motivation only was not significant, $b = 103.39$, $SE = 108.53$, 95% $CI = [-32.78, .428.07]$, and neither was the indirect effect through approach motivation only, $b = .63.90$, $SE = 116.45$, 95% $CI = [-130.20, 355.53]$. In sum, the association between subjective SES and risky decision-making, measured by expected salary in the job interview scenario, was not explained by approach and avoidance motivation combined or separately.

Exploratory Mediation Analysis: Motivational Orientation as One Mediator

Previous work has treated motivational orientation as one measure that represented the degree to which each participant was more avoidance or more approach oriented (Mann et al., 2004; Updegraff et al., 2007). Therefore, I explored a mediation model where subjective SES was the predictor, motivational orientation was the single mediator, and risky decision-making measured by expected salary in the job interview scenario was the outcome variable (see Figure 2.2). The mediator measure was constructed by taking the difference of each participant's standardized scores on the BAS and BIS scales (zBAS-zBIS). Positive scores represented predominantly approach motivation, and negative scores represented predominantly avoidance motivation. The greater the magnitude of a participant's difference

score, the greater the predominance of that participant's motivational orientation (Mann et al., 2004).

As demonstrated in the previous section, participants' subjective SES predicted the expected salaries they indicated in the job interview scenario, $\beta = .14$, $b = 1724.35$, $SE = 687.27$, $p = .013$, 95% $CI = [372.04, .3076.67]$. Subjective SES also predicted motivational orientation (BAS-BIS), $\beta = .12$, $b = 0.09$, $SE = .04$, $p = .042$, 95% $CI = [.003, .17]$. Then, expected salary was regressed on subjective SES and motivational orientation. Motivational orientation predicted expected salary, $\beta = .18$, $b = 2863.98$, $SE = 915.22$, $p = .002$, 95% $CI = [1063.13, 4664.83]$. The association between subjective SES and the expected salary (risky decision-making) observed in the first equation became weaker, $\beta = .12$, $b = 1478.47$, $SE = 682.27$, $p = .031$, 95% $CI = [135.99, 2820.95]$. To test the indirect effect of mediation, I used PROCESS Model 4 (Hayes, 2018). Results showed that the indirect effect of subjective SES on expected salary through motivational orientation was significant, $b = 245.89$, $SE = 151.20$, 95% $CI = [21.36, 632.03]$. This suggested that motivational orientation partially mediated the association between subjective SES and expected salary (risky decision-making).

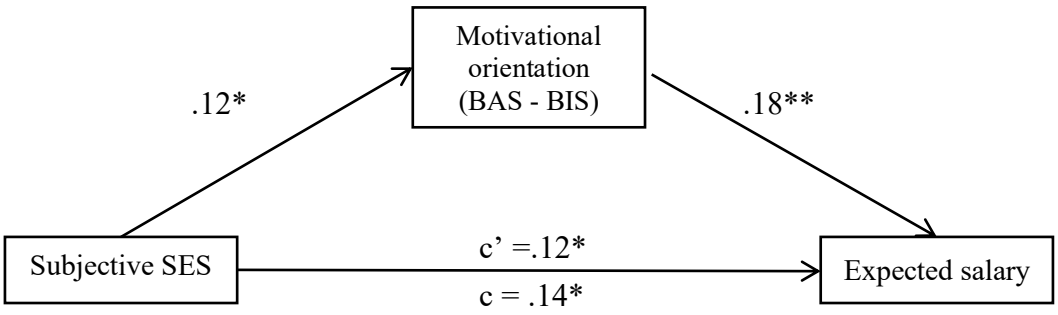


Figure 2.2. Exploratory mediation model of expected salary on subjective SES mediated by motivational orientation. Coefficients were standardized, *$p < .05$, **$p < .01$

Exploratory Mediation Analysis: Family Income (Objective SES) as Predictor

Although the proposed mediation model had subjective socioeconomic status as the predictor, I conducted exploratory analyses to examine whether approach and avoidance motivation combined mediated the association between family income, a more objective measure of socioeconomic status, and decision-making strategies. Family income predicted expected salary, β = .29, b = 2513.09, SE = 467.97, p < .001, 95% CI = [1592.29, 3433.90]. Family income did not predict either approach, β = -.07, b = -.01, SE = .01, p = .241, 95% CI = [-.03, .01], or avoidance motivation, β = .09, b = .02, SE = .01, p = .123, 95% CI = [-.01, .04]. Using PROCESS model 4 (Hayes, 2018), I ran an exploratory mediation analysis, where family income was the predictor, approach and avoidance motivations were the mediators, and expected salary in the job interview scenario was the outcome variable, both approach, β = .20, b = 10480.34, SE = 2789.99, p < .001, 95% CI = [4990.47, 15970.20], and avoidance motivation, β = .-14, b = -5644.65, SE = 2140.91, p = 009, 95% CI = [-9857.32, -1431.98], predicted expected salary. Finally, the association between family income and expected salary became stronger, β = .32, b = 2735.08, SE = 459.06, p < .001, 95% CI = [1831.78, 3638.38], and the indirect effect through approach and avoidance motivation was significant and negative, b = -221.99, SE = 130.64, 95% CI = [-532.97, -11.70]. While family income, approach and avoidance motivation predicted salary in the expected direction (higher family income, stronger approach motivation and weaker avoidance motivation predicted higher expected salary), family income predicted approach and avoidance motivation in the opposite direction from expected, although not statistically significant (higher income predicted weaker approach and stronger avoidance motivation). Therefore, when excluding this unexpected negative effect (indirect effect through approach and

avoidance motivation), the positive effect of family income on expected salary was larger (direct effect). I ran another exploratory mediation analysis replacing approach and avoidance motivation with one single mediator — motivational orientation (BAS-BIS). First, I examined the association between family income and motivational orientation. Contrary to expectation, higher family income was associated with stronger avoidance orientation, β = .12, b = -.06, SE = .03, p = .039, 95% CI = [-.12, -.003]. The mediation results showed that motivational orientation predicted expected salary, β = .23, b = 3702.43, SE = 873.30, p < .001, 95% CI = [1984.07, 5420.79]. Those who were more approach oriented indicated higher expected salary. Finally, the association between family income and expected salary became stronger, β = .32, b = 2740.58, SE = 458.81, p < .001, 95% CI = [1837.79, 3643.37], and the indirect effect through motivational orientation was significant and negative, b = -227.48, SE = 123.36, 95% CI = [-542.73, -39.65] (see Figure 2.3).[9] While family income and motivational orientation were positive predictors of expected salary (higher family income and more approach orientation predicted higher expected salary), family income was unexpectedly negatively associated with motivational orientation (higher family income predicted less approach orientation). Therefore, when excluding this unexpected negative

[9] I also examined the mediation models with the other decision-making strategy outcome measure — certificate program choice in the job certificate scenario. First, I established that family income predicted certificate program choice, b = -.13, SE = .05, p = .007, 95% CI = [-.23, -.04]. Those with higher family income were more likely to choose the high risk-high payoff program. Then, I ran the same mediation models as above replacing the outcome expected salary with certificate program choice. Approach motivation predicted certificate program choice, b = -.58, SE = .29, p = .047, 95% CI = [-1.15, -.01], while avoidance motivation did not, b = -.09, SE = .22, p = .691, 95% CI = [-.52, .34]. The association between family income and expected salary remained, b = -.14, SE = .05, p = .005, 95% CI = [-.24, -.04], and the indirect effect through approach and avoidance motivation was not significant, b = -.01, SE = .01, 95% CI = [-.03, .004]. Then, I ran the mediation with motivational orientation as the only mediator. Motivational orientation did not predict certificate program choice, b = -.09, SE = .09, p = .283, 95% CI = [-.27, .08]. The association between family income and expected salary remained, b = -.14, SE = .05, p = .005, 95% CI = [-.24, -.04]. The indirect effect through motivational orientation (BAS-BIS) was also not significant, b = .01, SE = .01, 95% CI = [-.003, .03]. This suggested that neither approach and avoidance motivation combined or motivational orientation mediated the association between family income and certificate program choice.

effect (indirect effect through motivational orientation), the positive effect of family income on expected salary was larger (direct effect). Both mediation models with family income as the predictor were statistically significant, but the direction of mediation was different from what was expected.

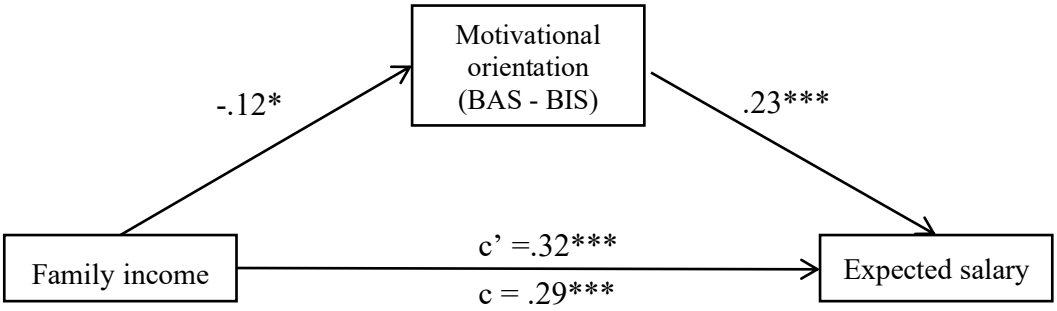


Figure 2.3. Mediation model of expected salary on family income mediated by motivational orientation. Coefficients were standardized, *$p < .05$, ***$p < .001$

LIWC Analysis: Approach and Avoidance Motivations Did Not Mediate the Association Between Subjective SES and Decision-making Processes

In addition to hypothesizing that subjective SES would predict risky decision-making outcome (e.g. expected salary in job interview scenario), I also expected subjective SES to predict decision-making processes. Such that higher (lower) socioeconomic status would predict a stronger focus on gain/positive (loss/negative) outcome in decision-making processes, and that this relationship would be mediated by stronger approach and weaker avoidance motivations.

In order to systematically categorize the emotional, cognitive and structural components of the participants' open-ended responses, I analyzed the open-ended responses using Linguistic Inquiry and Word Count (LIWC) 2015 (Pennebaker et al., 2015). I identified

some of the pre-programmed word categories that may represent the language of people with strong approach motivation and focus on gain/positive outcome, for example, drives (e.g. achieve, power, reward etc.), achievement (e.g. win, success, better etc.), power (e.g. superior, bully etc.), reward (e.g. take, prize etc.), and positive emotions (e.g. love, happy etc.). I also identified the categories that represented the language of people with strong avoidance motivation and concern about loss/negative outcome, demonstrating fear of loss, caution, uncertainty and indecision (e.g. Elliot et al., 2001; Hardie & Wright, 2013). For example, negation (e.g. no, not, never), discrepancy (e.g. should, would, could etc.), differentiation (e.g. hasn't, but, else etc.), risk (e.g. danger, doubt) and negative emotions (e.g. hurt, sad etc.). I expected that participants of lower SES would use more words that represented avoidance motivation and fewer words that represented approach motivation, and that this relationship would be mediated by approach and avoidance motivations.

First, I examined whether subjective SES predicted any of the identified word categories by regressing word categories coded from the open-ended responses for the job certificate and job interview scenario respectively on subjective SES. Subjective SES only predicted one word category—negative emotions for the job certificate scenario, β = -.13, b = -.42, SE = .19, p = .027, 95% CI = [-.79, -.05]. Consistent with my expectation, participants with lower SES were more likely to use negative emotion words when describing their reason for choosing a certain job certificate. Subjective SES did not predict any word category in the job interview scenario. I proceed to test the mediation among subjective SES, approach and avoidance motivation, and decision-making process measured by negative emotion words in the job certificate scenario.

To test the indirect effect of mediation, I used PROCESS Model 4 (Hayes, 2018).

Results showed that the indirect effect of subjective SES on negative emotions for the job certificate scenario through avoidance and approach motivation was not significant, b = .004, SE = .03, 95% CI = [-.05, .07]. This suggested that avoidance and approach motivation combined did not explain the association between subjective SES and negative emotion words (decision-making process). Furthermore, the indirect effect through avoidance motivation only was not significant, b = .01, SE = .02, 95% CI = [-.03, .07], and neither was the indirect effect through approach motivation only, b = -.001, SE = .02, 95% CI = [-05, .03]. The indirect effect through motivational orientation (BAS-BIS) was also not significant, b = -.01, SE = .02, 95% CI = [-09, .01]. In addition, none of the motivation mediators (approach, avoidance, approach and avoidance combined, difference between approach and avoidance) predicted negative emotions for the job certificate scenario. In sum, the association between subjective SES and decision-making process, measured by negative emotion words in the job certificate scenario, was not explained by the difference between approach and avoidance motivation, approach and avoidance motivation combined or only approach/avoidance motivation.

LIWC Analysis: Motivations Were Associated with Decision-making Processes

Although decision-making processes (represented by avoidance/approach-oriented word categories) were mostly not predicted by subjective SES, I wanted to examine whether these identified word categories were correlated with approach/avoidance motivation and motivational orientation in the predicted direction. I conducted Pearson correlation analysis between the word categories and avoidance motivation (BIS)/approach motivation (BAS)/motivational orientation (BAS-BIS) for the job interview (expected salary) and job certificate (choosing certificate program) scenario respectively.

For the job interview scenario, while there was no significant association between approach word categories (i.e. drives, achievement, power, reward and positive emotion) and motivations, all significant correlations between avoidance word categories (i.e. negations, discrepancy, differentiation, risk and negative emotion) and motivations were in the predicted direction. Those who were more approach oriented (BAS-BIS) were less likely to use negations ($r(278) = -.16$, $p = .008$), differentiation ($r(278) = -.15$, $p = .014$) and risk ($r(278) = -.17$, $p = .004$) words. Those with stronger avoidance motivation (BIS) were more likely to use negation ($r(278) = .16$, $p = .006$), differentiation ($r(278) = .22$, $p < .001$) and negative emotion ($r(278) = .12$, $p = .045$) words; while those with stronger approach motivation (BAS) were less likely to use risk words ($r(278) = -.15$, $p = .011$) when describing their reason for listing their expected salaries in the job interview scenario.

For the job certificate scenario, all significant correlations were in the predicted directions. Those who were more approach oriented (BAS-BIS) were more likely to use positive emotion words ($r(278) = .12$, $p = .039$), less likely to use discrepancy ($r(278) = -.12$, $p = .042$) and risk words ($r(278) = -.13$, $p = .033$). Those with stronger avoidance motivation (BIS) were less likely to use positive emotion words ($r(278) = -.22$, $p < .001$), but more likely to use discrepancy words ($r(278) = .12$, $p = .037$) when describing their reason for choosing a certificate program in the job certificate scenario. Overall, several of the identified word categories, especially avoidance word categories, did seem to accurately reflect participants' approach/avoidance oriented decision-making processes. (See Table 2.3 and 2.4 for correlations between identified word categories and subjective SES or motivations for each scenario.)

Table 2.3

Correlations between word categories and subjective SES/motivations for job interview (expected salary) scenario

Approach/avoidance oriented word category	Word category	Subjective SES	Avoidance motivation (BIS)	Approach motivation (BAS)	Motivational orientation (BAS-BIS)
Approach oriented	Drives	.05	-.04	.04	.06
	Achievement	.08	-.09	.04	.09
	Power	.01	-.02	.10	.08
	Reward	.03	-.06	-.03	.02
	Positive emotion	.04	-.07	.02	.07
Avoidance oriented	Negations	-.06	.16**	-.05	-.26**
	Discrepancy	-.04	-.01	.02	.02
	Differentiation	-.06	.22***	.02	-.15*
	Risk	-.05	.08	-.15*	-.17**
	Negative emotion	.09	.12*	-.01	-.09

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

Table 2.4

Correlations between word categories and subjective SES/motivations for job certificate (choosing certificate program) scenario

Approach/avoidance oriented word category	Word category	Subjective SES	Avoidance motivation (BIS)	Approach motivation (BAS)	Motivational orientation (BAS-BIS)
Approach oriented	Drives	.04	-.06	-.004	.04
	Achievement	-.02	-.11	-.06	.04
	Power	.03	-.02	.02	.03
	Reward	-.03	-.02	-.08	-.05
	Positive emotion	.07	-.22***	-.05	.12*
Avoidance oriented	Negations	-.04	-.02	.05	.05
	Discrepancy	-.001	.12*	-.04	-.12*
	Differentiation	.05	.03	.03	-.002
	Risk	-.07	.07	-.09	-.13*
	Negative emotion	-.13*	-.004	-.07	-.05

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

In summary, Study 1 did not support my hypotheses. Approach and avoidance motivations combined did not mediate the association between subjective socioeconomic status and decision-making strategies/processes. However, exploratory analysis showed that motivational orientation, measured by BAS-BIS, partially mediated the association between subjective socioeconomic status and decision-making strategy (measured by expected salary in job interview scenario). The exploratory analysis in this study provided some support for the mediating effect of motivational orientation. Next, I conducted an experimental study to examine whether college students from varying socioeconomic statuses would find messages

that match their motivational orientation to be more effective.

Study 2

Previous research has shown that messages that are framed congruent with people's motivational orientation are more effective than messages that are incongruent (e.g. Mann et al., 2004; Sherman et al., 2006). Study 2 experimentally manipulated the framing of messages. One message aligned more with avoidance motivation (loss frame) and the other aligned more with approach motivation (gain frame). This study examined whether or not people of lower socioeconomic status would be more convinced by loss message framing, and people of higher socioeconomic status would be more convinced by gain message framing. I adopted a paradigm utilized in previous research that demonstrated the congruency effect — health messages framed to be congruent with individuals' motivations were more effective in promoting health behaviors than health messages incongruent with motivations (Mann et al., 2004; Sherman et al., 2006). While past studies focused on health, this study advocated for interactions with instructors, which had been found to be positively associated with students' academic performance (e.g. Guerrero & Rod, 2013; Mireles-Rios & Romo, 2010). Students who went to office hours or interacted with faculties more regularly were less likely to drop out of school and had higher GPAs (Hickerson & Giglio, 2009; Sapp & Simon, 2005). While research has documented the benefits of interacting with instructors, studies suggested that students and parents from lower socioeconomic status backgrounds were less likely to interact with their (children's) instructors and perceived the teacher-student relationship to be of lower quality (e.g. Ankrum, 2016; Engle & Tinto, 2008; Machen et al., 2005; Ratcliff & Hunt, 2009; Xuan et al., 2019). Therefore, examining whether simple methods like changing the framing of a massage could promote positive behaviors that is

especially needed for lower socioeconomic status students is crucial to aiding their successes in college.

A moderation analysis would be performed to examine the interaction between subjective socioeconomic status and message framing on self- reported academic related interactions (see Figure 2.4 for proposed model). Based on previous research, my main hypothesis was that higher subjective socioeconomic status would be associated with more academic related interactions, and that this association would be strengthened for participants in the gain framed condition, and weakened for participants in the loss framed condition. I also measured several other related outcome variables, such as behavioral intentions and feelings toward academic endeavor, for exploratory analyses.

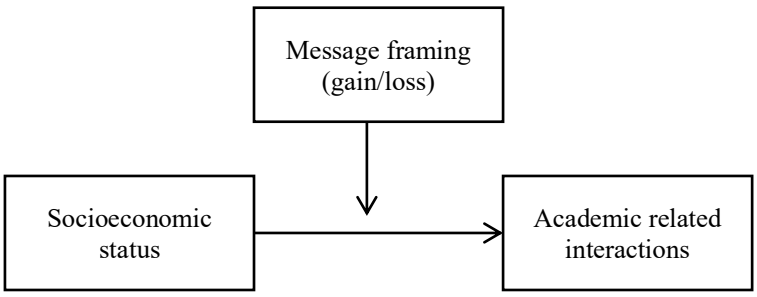


Figure 2.4. Message framing moderates the relationship between SES and interactions with instructors.

Method

Participants

Participants were undergraduates recruited via UCSB SONA system throughout Winter and Spring quarter of 2021. Participants signed up for a 4-part study and would receive 2 research credit for their full participation. In order to access the follow-up survey,

participants must complete the previous survey. If they dropped out during the study, they would receive 0.5 credit for each part they have completed.

Three hundred sixty-five participants took the first survey. Three hundred and six participants completed the second survey (83.8% retention). Two hundred forty-three participants completed the third survey (79.4% retention). One hundred eighty-nine participants completed the fourth (last) survey (77.8% retention). That is, out of all the participants who took the initial survey ($N = 365$), 66.6% ($N = 243$) completed at least the first three surveys in the study, and only 51.8% ($N = 189$) completed the full study.[10]

Eleven participants were excluded from the analyses for failing the attention check in the initial survey (i.e. "This is an attention check, please select 'very false for me'"). Thirty more participants were excluded for not paying attention to the message in the flyer used as the manipulation (did not select the correct title for the flyer they just read). Those who did not complete the third survey in the study were also excluded ($N = 110$), leaving 214 participants for the analyses ($M_{age} = 18.99$, $SD_{age} = 1.55$; 30.4% male, 68.7% female and 0.9% other; 37.4 % White, 29.4% Asian, 19.6% Latinex, 3.7% Black, 9.9% Other).

Procedure

The initial survey was made available to the participants every Monday at 9am, and the deadline to complete the initial survey was Tuesday at 8pm. Twenty-two hours completing each survey, participants would be able to take the next survey. They had a 4-

[10] To assess whether the dropout was systematic based on socioeconomic status, I conducted independent samples t-tests with dropout or not as the independent variable and subjective SES and income as the dependent variables for each survey. Income, $t(354) = -.55$, $p = .580$, and subjective SES, $t(363) = -.1.24$, $p = .216$, did not differ between those who dropped out after the first survey compared to those who did not; income, $t(295) = -1.59$, $p = .068$, and subjective SES, $t(304) = -1.04$, $p = .298$, did not differ between those who dropped out after the second survey compared to those who did not; income, $t(235) = -.27$, $p = .789$, and subjective SES, $t(241) = -.25$, $p = .806$, did not differ between those who dropped out after the third survey compared to those who did not.

hour time window to complete each follow up survey. That is, if a participant completed their initial survey on Monday at 6pm, they would be able to take the second survey on Tuesday from 4 to 8pm. If they completed the second survey on Tuesday at 7pm, they would be able to take the third survey on Wednesday from 5 to 9pm. If they completed the third survey on Wednesday at 8pm, they would be able to take the fourth (last) survey on Thursday from 6 to 10pm. However, if they missed one survey, they would not be able to continue with the rest of the study.

In the initial survey, after consenting to participate in the study, participants were first presented with detailed information regarding the structure and schedule of the study. After, they were randomly assigned to be presented with a flyer titled either "How to not be a bad student" (loss framed) or "How to be a good student" (gain framed). After the manipulation, they responded to questions related to the flyer. Then, the participants' intention to interact with instructors were measured. Finally, they completed the demographic questionnaire.

In the three follow up surveys, the participants were asked about which type of interactions they have had with instructors and the emotions they felt about their academic endeavors since they last filled out the survey for this study. In the last survey, in addition to measuring their interactions and emotions, we also assessed the participants ability uncertainty about their (intended) major. Finally, we thanked them for their participation.

Measures and Materials

Below were the measures and materials in the first survey:

Interaction with instructors flyer. Participants were randomly assigned to receive one of two flyers, both advocating for interacting with their instructors (see flyers in Appendix F). One flyer was gain framed, titled "How to be a good student", and the other

was loss framed, titled “How to not be a bad student”. The gain framed flyer read “Going to office hours will help improve your grade. Asking questions in class or emailing your instructor can help you better understand the material!”, and the loss framed flyer read “Going to office hour will help you avoid getting bad grades. Asking questions in class or emailing your instructor can help you not be confused about the material!”.

Message effectiveness and relevance. We assessed the effectiveness and relevance of the flyer by asking the participants “How (in)effective did you feel the message on the flyer was?” and “How (ir)relevant was the information on the flyer to you?”. They were assessed on a 5 point scale, from 1 “Very ineffective (irrelevant)” to 5 “Very effective (relevant)” (effectiveness: $M = 3.07$, $SD = 1.04$; relevance: $M = 3.66$, $SD = 1.07$).

Behavioral intentions. Participants’ behavioral intention was measured with three questions, and participants were given binary choices (yes and no) for each question. Intention to learn more about making effective use of virtual office hours was measured with “Due to COVID-19, office hours are now virtual. Would you like to receive information on how to effectively make use of virtual office hours?” (54% yes, 46% no). Intention to attend office hours was measured with “If you miss a lecture tomorrow because of some personal matter, will you attend office hour to make up it?” (66% yes, 34% no). Intention to email the instructor was measured with “This week, if some course content is unclear to you, will you email your instructor(s) for clarification?” (58% yes, 42% no).

Socioeconomic status. Participants’ socioeconomic status was measured with the same MacArthur Scale of Subjective Social Status (Adler & Stewart, 2007) as described in Study 1 ($M = 6.31$, $SD = 1.65$).

Demographic information. Participants filled out demographic information such as gender, age, ethnicity, political ideology, and religion (see Appendix E for demographic questionnaire).

Below were the measures in the second, third and fourth survey:

Academic related interactions. Participants' academic related interactions throughout the day was assessed with "Which of the following interactions have you had since you last filled out the survey for this study? (select all that apply)". They were given 11 options (e.g. "went to professor's/TA's office hours", "asked a question during lecture/lab/section/seminar", "Attended CLAS group tutorials", and "Emailed a professor/TA") (see Appendix G for all options). They responded to this question in each of the follow up surveys. Each type of interaction was assigned 1 point. A minimum score would be 0 and maximum score would be 11 per survey (2nd survey: $M = 1.07$, $SD = 0.93$; 3rd survey: $M = 1.26$, $SD = 0.97$; 4th survey: $M = 1.28$, $SD = 1.09$). The mean number of interactions selected across surveys was calculated ($M = 1.19$, $SD = 0.84$). For each survey, the three most common interactions were "asked a question during lecture, section, lab, seminar", "emailed a professor" and "emailed a TA".

Feelings toward academic endeavors. Participants' feelings/emotions toward their academic endeavors were measured with 12 emotions belonging to 4 different categories: 1) Positive approach: Proud, optimistic and enthusiastic, 2) Negative approach: Frustrated, guilty and disappointed, 3) Positive avoidant: Relaxed, relieved, and calm, and 4) Negative avoidant: Worried, ashamed, and pessimistic (Carver, 2004; Carver & Harmon-Jones, 2009; Elliot et al., 2013). Each emotion was assessed with a 4-point scale, ranging from 1 "very slightly or not at all" to 5 "extremely". These emotions were mostly selected from the

Positive and Negative Affect Schedule (Watson et al., 1988) based on their relevance to academic endeavors. A few emotions were then added to keep the number of emotions in each category consistent. The mean of emotion scores for each category across surveys was calculated (+ approach: $M = 2.67$, $SD = 0.88$, - approach: $M = 1.83$, $SD = 0.80$; + avoidant: $M = 2.46$, $SD = 0.82$, - avoidant: $M = 2.07$, $SD = 0.78$). See Table 2.5 for the descriptive statistics of each survey.

Table 2.5
Descriptive statistics for feelings toward academic endeavors by survey.

Survey No.	2nd Survey	3rd Survey	4th Survey
+ Approach	$M = 2.69$	$M = 2.70$	$M = 2.59$
	$SD = 0.94$	$SD = 0.93$	$SD = 0.98$
- Approach	$M = 1.90$	$M = 1.79$	$M = 1.74$
	$SD = 0.89$	$SD = 0.86$	$SD = 0.91$
+ Avoidant	$M = 2.42$	$M = 2.48$	$M = 2.50$
	$SD = 0.91$	$SD = 0.92$	$SD = 0.94$
- Avoidant	$M = 2.21$	$M = 2.03$	$M = 1.92$
	$SD = 0.85$	$SD = 0.85$	$SD = 0.83$

The measure below was only presented in the fourth (last) survey:

Ability uncertainty. Ability uncertainty towards participants' major was measured with the Ability Uncertainty Scale (Lewis & Hodges, 2015) (see Appendix H for all items). There were 12 items (e.g. "I worry my abilities aren't good enough to do well in my (intended) major." and "When doing work in my (intended) major, I feel I have the skills that

I need (reverse).”), assessed on a 6-point scale, ranging from 1 “strongly disagree” to 6 “strongly agree” (M = 3.36, SD = 0.88, α = .92).

Results

Moderation Analysis: No Interaction Between Subjective SES and Message Framing on Academic Related Interactions

To examine whether the relationship between subjective socioeconomic status and academic related interactions changes depending on the message framing, a hierarchical multiple regression analysis was conducted. In the first step, two variables were included, subjective socioeconomic status and message framing. There was no significant main effect for either subjective SES, β = .10, b = 0.05, SE = .04, p = .167, 95% CI = [-.02, .12], or message framing, β = -.04, b = -0.07, SE = .12, p = .551, 95% CI = [-.30, .16]. These predictors did not account for a significant amount of variance in academic related interactions, R^2 = .01, $F(2, 211) = 1.18$, p = .308. Subjective socioeconomic status and message framing did not predict academic related interactions. Next, the interaction term between subjective SES and message framing was added to the model (PROCESS model 1). The interaction term only explained an additional 1% of the variance in academic related interactions, $F(2, 210) = 2.21$, p = .139. Contrary to the key hypothesis, there was not a significant interaction between subjective socioeconomic status and message framing, b = 0.11, SE = 0.07, p = .139, 95% CI of b = [-0.03, 0.25]. Gain or loss framed messages did not have a significant effect on the relationship between subjective socioeconomic status and academic related interactions. Among those in the gain framed condition, subjective socioeconomic status did not associate with academic related interactions, b = 0.01, SE = 0.04, 95% CI of b = [-0.08, 0.09], p = .881; among those in the loss framed condition, higher

subjective socioeconomic status predicted more academic related interactions, $b = 0.11$, $SE = 0.06$, 95% CI of $b = [0.003, 0.22]$, $p = .044$ (see Figure 2.5).[11] This pattern was different from what I hypothesized, as I predicted that although higher subjective SES would be associated with more academic related interactions overall, this association would be strengthened for participants who saw the gain framed flyer, and weakened for those who saw the loss framed flyer. Instead, I found that overall, there was no association between subjective SES and academic related interactions. Furthermore, of those in the loss framed condition, people with higher subjective SES engaged in more academic related interactions, while subjective SES did not predict academic related interactions for those in the gain framed condition.

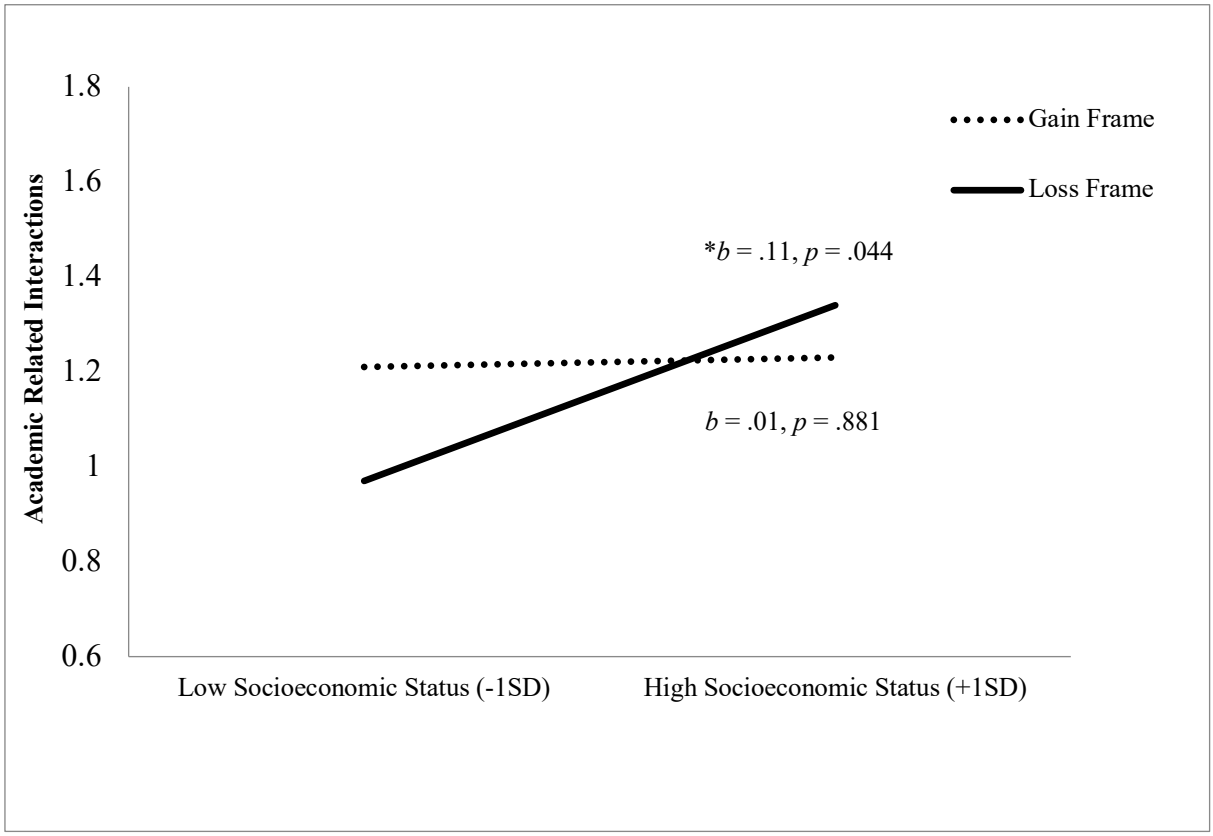


Figure 2.5. Interaction pattern between subjective socioeconomic status and gain/loss framed

[11] Exploratory moderation analysis was also conducted with family income (objective socioeconomic status) as the predictor, gain/loss framed flyers as the moderator and academic related interactions as the outcome variable. There was not a significant interaction between family income and message framing, $b = 0.01$, $SE = 0.03$, $p = .812$, 95% CI of $b = [-0.06, 0.07]$.

flyer on academic related interactions. The interaction was not significant, $b = 0.11$, $SE = 0.07$, 95% CI of $b = [-0.03, 0.25]$, $p = .139$. *$p < .05$

Additional moderation analyses were conducted with feelings toward academic endeavors, behavioral intentions, and ability uncertainty as the outcome variable, respectively. There was no significant interaction between subjective socioeconomic status and message framing on any of these outcome variables.[12] Further, there was no significant conditional effect of subjective SES on the outcome variables by gain/loss framed flyers. Gain or loss framed flyers did not have an effect on the relationship between subjective socioeconomic status and feelings toward academic endeavors, behavioral intentions, or ability uncertainty. (See Table 2.6 for correlation between subjective SES and key variables, and Table 2.7 for the effect of gain vs. loss message framing on key variables.)

Table 2.6
Correlation between subjective socioeconomic status and key variables.

Variable	*r* (212)	*p*
Academic related interactions	.10	.157
Learn about making use of office hours	.17*	.012
Intention to attend office hours	.05	.478
Intention to email instructors	-.06	.395
Positive approach emotions	.09	.182
Negative approach emotions	-.04	.536
Positive avoidant emotions	.06	.374
Negative avoidant emotions	-.09	.215
Ability uncertainty towards major	-.14	*.066*

Note. Pearson and point Biserial Correlations were conducted to examine the relationship between subjective SES and key variables. There was a significant positive association

[12] Moderation analyses with subjective SES as predictor, message framing as moderator and ability uncertainty as outcome variable, $b = -0.03$, $SE = 0.08$, 95% CI of $b = [-0.19, 0.14]$, $p = .759$; positive approach emotions as outcome variable, $b = 0.0005$, $SE = 0.08$, 95% CI of $b = [-0.14, 0.15]$, $p = .994$; negative approach emotions as outcome variable, $b = 0.08$, $SE = 0.07$, 95% CI of $b = [-0.05, 0.21]$, $p = .232$; positive avoidant emotions as outcome variable, $b = -0.01$, $SE = 0.07$, 95% CI of $b = [-0.15, 0.13]$, $p = .907$; negative avoidant emotions as outcome variable, $b = 0.09$, $SE = 0.07$, 95% CI of $b = [-0.04, 0.22]$, $p = .195$; willingness to receive information on how to make effective use of virtual office hours as outcome variable, $b = 0.02$, $SE = 0.17$, 95% CI of $b = [-0.31, 0.36]$, $p = .895$; intention to attend office hours as outcome variable, $b = 0.003$, $SE = 0.18$, 95% CI of $b = [-0.35, 0.35]$, $p = .989$; intention to email the instructors as outcome variable, $b = 0.02$, $SE = 0.17$, 95% CI of $b = [-0.32, 0.36]$, $p = .895$.

between subjective SES and intention to learn more about making effective use of virtual office hours, such that higher SES students were more willing to receive information on how to make effective use of virtual office hours. There was a marginal negative association between subjective SES and ability uncertainty towards major, such that higher SES students had lower ability uncertainty towards their major. *$p < .05$

Table 2.7
Independent samples t-tests for gain vs. loss message framing on key variables.

Variable	*Gain: M (SD)*	*Loss: M (SD)*	*t(212)*	*p*
Academic related interactions	1.22 (.82)	1.14 (.88)	0.67	.506
Learn about making use of office hours	1.43 (.50)	1.50 (.50)	-0.95	.343
Intention to attend office hours	1.32 (.47)	1.37 (.49)	-0.76	.448
Intention to email instructors	1.43 (.50)	1.41 (.50)	0.19	.847
Positive approach emotions	2.73 (.87)	2.60 (.89)	1.05	.294
Negative approach emotions	1.86 (.82)	1.79 (.78)	0.60	.550
Positive avoidant emotions	2.43 (82)	2.50 (.83)	-0.64	.552
Negative avoidant emotions	2.05 (.78)	2.11 (.77)	-0.50	.615
Ability uncertainty towards major	3.29 (.89)	3.44 (.87)	-1.06	.291
Flyer effectiveness	3.23 (1.01)	2.85 (1.05)	2.69**	.008
Flyer relevance	3.75 (1.05)	3.53 (1.08)	1.51	.133

Note. To examine whether gain and loss message framing had an effect on various dependent variables, independent samples t-tests were conducted. There was a difference in perceived effectiveness between those who saw the gain and loss framed flyers. Students perceived gain framed flyers to be more effective than loss framed flyers. No other difference was found. **$p<.01$

Chapter 2 Discussion

In Study 1, I hypothesized that subjective socioeconomic status was associated with different decision-making strategies and processes among college students, and approach and avoidance motivation would explained these relationships. Although I found that approach and avoidance motivation combined did not mediate the relationship between socioeconomic status and decision-making strategies/processes, motivational orientation, measured by BAS-BIS, did partially mediate the association between socioeconomic status and decision-making strategies, assessed by expected salary in job interview scenario. College students with higher subjective socioeconomic status listed higher expected salaries (high risk-high payoff) in the job interview scenario, and this was partially explained by their stronger approach

orientation.

In Study 2, I hypothesized that people of higher subjective socioeconomic status would engage in more academic related interactions. Furthermore, this relationship would be strengthened if participants in the gain framed flyer condition, but weakened if participants were in the loss framed flyer condition. The rationale was that gain framed messages would be more effective for individuals with higher socioeconomic status as they were more approach oriented, while loss framed messages would be more effective for individuals with lower socioeconomic status as they were more avoidance oriented. Results did not support my hypotheses. Subjective socioeconomic status was not associated with academic related interactions, and gain/loss framed flyer did not influence the relationship between subjective socioeconomic status and academic related interactions.

Limitations and Future Directions

Study 1 examined hypothetical job seeking scenarios, which were both somewhat related to income. Investigating the risks and payoffs in the financial domain was a conventional approach (e.g. Kahneman & Tversky, 1979), yet the risks and payoffs that college students have to assess in their daily lives are often not money related. For example, students may have to consider the risk of missing an office hour in order to spend time with friends, the risk of not having enough time for homework by joining another club, or asking a clarifying question in class risking embarrassing themselves. These tradeoffs are important decision-making moments in college students' lives, and are perhaps more relevant to them at the moment than job-seeking. Therefore, future research may investigate the decision-making processes and strategies in more college life relevant scenarios. I expect that both national and socioeconomic culture would play a role in driving their decision-making. For

example, collectivists/people from lower socioeconomic status who focus more on others' opinions and perspectives (Morling, Kitayama, & Miyamoto, 2002; Heine et al., 1999) may perceive higher risk of embarrassing themselves (Singelis & Sharkey, 1995) when asking questions in class compared to individualists/people from higher socioeconomic status.

Another limitation of Study 1 was its use of hypothetical strategic decision-making scenarios where the stakes were low and may not be generalized to real life. Future studies may focus on actual behaviors that people engaged in with real consequential impact. For example, one may assess students' course, club or internship choices and interview them regarding them decision-making processes and strategies.

One limitation of Study 2 was the way the main outcome variable — academic related interactions — was measured. While the study meant to examine whether gain versus loss framed message was effective in promoting more academic related interactions for students of varying socioeconomic statuses, I only measured the number of types of interactions the students engaged in rather than the actual number of interactions, regardless of interaction type. It is possible that a student attends more than one office hours or emails multiple instructors in one day. Students may be more comfortable with one method of interaction and rely on it. These numbers would not be captured by the way academic related interactions was measured in Study 2. Perhaps the low average (1.19 out of 11) for academic related interactions selected partly reflected this issue. To better assess the number of academic related interactions, in addition to providing various types of interactions for participants to choose from, they should also be prompted to enter the number of interactions they engaged in for each type. The sum would then better reflect the outcome variable I was aiming the capture.

Another limitation was excluding about a third of the original sample from the analyses due to the nature of this multipart study. Since there were three follow up surveys in this study, those who did not complete the first or the second survey were excluded from the analyses (33% of the original sample excluded). This likely meant that students with characteristics such as better able to follow instructions and manage their time were included in the analyses, making the results less generalizable.

Although subjective socioeconomic status was a more encompassing socioeconomic status measure and allows participants to compare themselves to whomever they deem relevant, it has some limitations. Subjective socioeconomic status is more vulnerable to personal biases. For example, a more pessimistic person will likely put themselves on the lower part of the SES ladder. A humble person may be unwilling to place themselves on the top of the ladder despite having a great job, income, education etc. In Study 1, subjective socioeconomic status was associated with avoidance motivation, suggesting that perhaps people with stronger avoidance motivation were more likely to view themselves to be of lower status.[13]

I focused on approach/avoidance motivation as one mechanism, however, socioeconomic differences in risky decision-making are determined by multiple psychological factors. The emphasis on interdependence in lower socioeconomic culture and the focus of independence in higher socioeconomic culture may play a role in driving preferences for different strategies. For example, getting a job with a higher salary may be a

[13] To examine whether approach and avoidance motivation played a role in predicting people's subjective SES based on their family income, I ran two moderation analyses with family income as the predictor, subjective SES as the outcome variable and approach/avoidance motivation as the moderator. There was no significant interaction between income and approach motivation (b = 0.02, SE = 0.10, 95% CI of b = [-0.18, 0.21], p = .876) or income and avoidance motivation (b = 0.07, SE = 0.07, 95% CI of b = [-0.06, 0.21], p = .292) on subjective SES.

demonstration of personal strength and success, and resonate with high socioeconomic status individuals' independent sense of self; increasing one's chances of getting a job by demanding a lower salary may demonstrate valuing family financial security over personal achievement, and therefore may resonate with the more interdependent sense of self of lower socioeconomic status individuals. Socioeconomic differences in sense of control and self-efficacy (Oertig et al., 2013; Schnelle et al., 2010) may also relate to how people make risky decisions. People from higher socioeconomic backgrounds have stronger sense of control and self-efficacy (Oertig et al., 2013; Schnelle et al., 2010). They may thus perceive more control over the results and their risk-taking to be more likely to bring a favorable outcome than do people from lower socioeconomic status, and this culturally shared perception may also contribute to their risk-taking tendencies.

Theoretical and Practical Implications

Two studies aimed to explore the real-life consequences of socioeconomic differences in psychological orientations within domains highly relevant to college students. This research provided an opportunity to understand how psychological tendencies, driven by one's background, could lead to decisions and behaviors with long term impact. Although having a higher salary seemed to be a superior outcome to everyone, the risk of not getting the position weighs differently for different individuals, and socioeconomic background influences how people weigh these potential risks and benefits. When interacting with people from different socio-cultural backgrounds, it is crucial to keep in mind that "different people value different things" (Kauffman, 2020). Having an understanding of the underlying psychological processes driving people's decision-making may bring about smoother and more productive interactions.

Although the proposed models were not supported, one mediation model in line with my theoretical approach was found via exploratory analysis. Socioeconomic status predicted people's decision-making strategies, such that those from higher (lower) socioeconomic status preferred higher risk-higher payoff (lower risk-lower payoff) strategies, and this was partly explained by the socioeconomic differences in people's motivational orientations, where those from higher (lower) socioeconomic status were more approach (avoidance) oriented. Focusing on avoidance goals (e.g. avoid not getting a position or not passing a certificate program) may be a better strategy for people from lower socioeconomic cultures where their sense of responsibility to others and financial stability may be valued; emphasizing approach goals (e.g. getting a high salary or receiving a more prestigious certificate) may be a better strategy for people from higher socioeconomic cultures where personal achievements and successes are crucial (Kraus et al., 2010; Manstead, 2018; Stephens et al., 2014; Adams, 2005; Kim & Lawrie, 2019). These goals then drive how people make decisions.

Beyond college students, the present research has broader implications for other populations such as businessmen/women and medical professionals when studying strategic decision-making, Socioeconomic differences in motivational orientations may underlie how company officials make financial/business decisions and how doctors/patients weigh different treatment options. Future research could examine how socioeconomic variances in psychological factors explain the socioeconomic differences in organizations' financial decisions or doctor and patients' treatment plans.

Conclusion

While most college students aim to do well in school and get a good position upon

graduation, there are socioeconomic differences in the strategies they choose to pursue these goals. This research did not provide convincing evidence that psychological difference in approach/avoidance motivation is one of the mechanisms that underlie these socioeconomic differences in strategic decision-making. Furthermore, methods like gain/loss message framing, aiming to appeal to people's varying motivational orientations, may not be an effective way to drive behavioral changes for students from varying socioeconomic statuses.

General Discussion

The present research examined how sociocultural factors such as national culture and socioeconomic status may drive college students' decision-making, and explored an underlying mechanism — approach/avoidance motivation. Chapter 1 examined the role of national culture in baseball strategic decision-making among professional baseball teams in North American and Japan (Study 1), and among baseball fans in the US and Japan (Study 2). The findings were robust and supported the hypotheses. Archival data from professional baseball leagues demonstrated that outcomes reflecting high risk-high payoff strategies were more prevalent in North America, whereas outcomes reflecting low risk-low payoff strategies were more prevalent in Japan. Fans' responses to baseball scenarios showed consistent pattern such that Japanese chose low risk-low payoff strategies more than European Americans did, and European Americans chose high risk-high payoff strategies more than Japanese did. Further, motivational orientation mediated the impact of national culture on strategic decision-making. Chapter 2 examined the role of socioeconomic status in decision-making strategies and processes among college students in the job seeking domain (Study 1), and how gain/loss message framing and socioeconomic status would interact to predict college students' academic related interactions (Study 2). The findings did not support the hypotheses. Approach and avoidance motivation did not explain the relationship between subjective socioeconomic status and decision-making strategies/processes. However, an exploratory mediation analysis suggested that motivational orientation, measured by BAS-BIS, partially explained the association between socioeconomic status and decision-making strategies. This mediation model theoretically aligned with the proposed model. Another study found that students of higher subjective socioeconomic status did not engage in more

academic related interactions, and gain/loss framed flyer did not influence the relationship between subjective socioeconomic status and academic related interactions.

In every single waking moment, people find themselves in situations in which they must make decisions. Regardless of whether one is a professional athlete or a college student, some of these decisions-making moments could be consequential. Since every person has different goals, motivations, feelings and emotions, each person approaches their decision-making opportunities differently. This research showed that the way people make decisions might depend on their sociocultural backgrounds, and motivational orientation might be one of the underlying psychological processes.

In addition, the present research highlights the importance of using multiple methods and different perspectives to address the questions involving decision-making. Across four studies, this research addressed questions of decision-making with real baseball statistics (Ch 1 Study 1), hypothetical baseball scenarios (Ch 1 Study 2), job seeking scenarios (Ch 2 Study 1), and self-reported behavioral measures in college(Ch 2 Study 2), among different national (Ch 1) and socioeconomic cultures (Ch 2). It also examined the perspectives of professional athletes (Ch 1 Study 1), baseball fans (Ch 1 Study 2), and college students (Ch2).

While the present research focused on national and socioeconomic culture, other aspects of people's sociocultural backgrounds, such as religion, may also influence people's decision-making. In addition to motivational orientation, other psychological processes such as sense of control, self-efficacy and optimism bias, may also underly the association between culture and decision-making (e.g. Antonczyk & Salzmann, 2014; Oertig et al., 2013; Schnelle et al., 2010). The present research may provide some foundation for future work examining cultural variations in decision-making in different domains.

Conclusion

People's sociocultural backgrounds may influence the way they are motivated, which in turn drives the strategies they choose to approach their goals. The best choice for one person may not be so great for another, and the strategies that are successful for one person may not work for another. As each choice and strategy comes with different tradeoffs between risks and benefits, culture influences those judgments about potential risks and benefits by determining where the balance point is. This research opens exciting opportunities for understanding how different people make decisions and why.

References

Aaker, J. L., & Lee, A. Y. (2001). "I" seek pleasures and "we" avoid pains: The role of self-regulatory goals in information processing and persuasion. *Journal of Consumer Research*, *28*(1), 33–49. https://doi.org/10.1086/321946

Adams, G., & Plaut, V. C. (2003). The cultural grounding of personal relationship: Friendship in North America and West African worlds. *Personal Relationships, 10*(3), 283-451. https://doi.org/10.1111/1475-6811.00053

Amir, D., Jordan, M. R., & Rand, D. G. (2018). An uncertainty management perspective on long-run impacts of adversity: The influence of childhood socioeconomic status on risk, time, and social preferences. *Journal of Experimental Social Psychology*, *79*, 217–226. https://doi.org/10.1016/j.jesp.2018.07.014

Amir-ud-Din, R., Abbas, F., & Javed, S. A. (2018). Poverty as Functioning Deprivation: Global Estimates. *Social Indicators Research*, *140*(3), 1077–1108. https://doi.org/10.1007/s11205-017-1798-7

Ankrum, R. J. (2016). Socioeconomic Status and Its Effect on Teacher/Parental Communication in Schools. *Journal of Education and Learning*, *5*(1), 167. https://doi.org/10.5539/jel.v5n1p167

Antonczyk, R. C., & Salzmann, A. J. (2014). Overconfidence and optimism: The effect of national culture on capital structure. *Research in International Business and Finance*, *31*, 132–151. https://doi.org/10.1016/j.ribaf.2013.06.005

Arrow, K. J. (1965). Aspects of the theory of risk-bearing. *Cambridge University Press*.

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, 191–215.

Bandura, A. (1990). Perceived self-efficacy in the exercise of personal agency. Journal of *Applied Sport Psychology*, *2*(2), 128–163. https://doi.org/10.1080/10413209008406426

Bangkok Post Publication Limited. (2013, June 12). Japan baseball chiefs admit lying over ball change. Retrieved November 17, 2020, from https://www.bangkokpost.com/sports/354749/japan-baseball-chiefs-admit-lying-over-ball-change

Baseball Reference. (2017). 2017 MLB team statistics. https://www.baseballreference.com/leagues/MLB/2017.shtml

Baumer, E. P., & South, S. J. (2001). Community Effects on Youth Sexual Activity. *Journal of Marriage and Family*, 63(2), 540–554. https://doi.org/10.1111/j.1741-3737.2001.00540.x

Berkman, E. T., Lieberman, M. D., & Gable, S. L. (2009). BIS, BAS, and response conflict: Testing predictions of the revised reinforcement sensitivity theory. *Personality and Individual Differences*, *46*(5-6), 586-591. https://doi.org/10.1016/j.paid.2008.12.015

Bolin, J. H. (2014). Hayes, Andrew F. (2013). Introduction to Mediation, Moderation, and Conditional Process Analysis: A Regression-Based Approach. New York, NY: The Guilford Press. *Journal of Educational Measurement*, *51*(3), 335–337. https://doi.org/10.1111/jedm.12050

Brisbee, G. (2013, June 12). Japan admits to juicing balls. Retrieved November 28, 2020, from https://www.sbnation.com/hot-corner/2013/6/12/4424132/japan-npb-juicing balls

Brown, J. S. (1948). Gradients of approach and avoidance responses and their relation to

level of motivation. *Journal of Comparative and Physiological Psychology, 41*(6), 450–465. https://doi.org/10.1037/h0055463

Buhrmester, M., Kwang, T., & Gosling, S. D. (2011). Amazon's Mechanical Turk: A new source of inexpensive, yet high-quality, data? P*erspectives on Psychological Science*, *6*, 3–5.

Carver, C. S. (2004). Negative Affects Deriving From the Behavioral Approach System. *Emotion*, *4*(1), 3–22. https://doi.org/10.1037/1528-3542.4.1.3

Carver, C. S., & Harmon-Jones, E. (2009). Anger is an approach-related affect: *Evidence and implications. Psychological Bulletin*, *135*(2), 183–204. https://doi.org/10.1037/a0013965

Carver, C. S., & White, T. L. (1994). Behavioral inhibition, behavioral activation, and affective responses to impending reward and punishment: The BIS/BAS Scales. *Journal of Personality and Social Psychology*, *67*(2), 319–333. https://doi.org/10.1037/0022-3514.67.2.319

Chen, H. Y., Ivers, R. Q., Martiniuk, A. L. C., Boufous, S., Senserrick, T., Woodward, M., Stevenson, M., & Norton, R. (2010). Socioeconomic status and risk of car crash injury, independent of place of residence and driving exposure: Results from the DRIVE Study. *Journal of Epidemiology & Community Health*, *64*(11), 998–1003. https://doi.org/10.1136/jech.2009.091496

Chiu, C.-Y., Gelfand, M. J., Yamagishi, T., Shteynberg, G., & Wan, C. (2010). Intersubjective Culture: The Role of Intersubjective Perceptions in Cross-Cultural Research. *Perspectives on Psychological Science*, *5*(4), 482–493. https://doi.org/10.1177/1745691610375562

Chuang, R., Ishii, K., Kim, H. S., & Sherman, D. K. (2021). Swinging for the Fences Versus Advancing the Runner: Culture, Motivation, and Strategic Decision Making. *Social Psychological and Personality Science*, 1948550621999273.

City Performance Scorecards. (2018). *City performance scorecards*. Poverty in San Francisco | City Performance Scorecards. https://sfgov.org/scorecards/safety-net/poverty-san-francisco.

Cyders, M. A., & Smith, G. T. (2008). Emotion-based dispositions to rash action: Positive and negative urgency. *Psychological Bulletin*, *134*(6), 807-828. https://doi.org/10.1037/a0013341

Demaree, H. A., DeDonno, M. A., Burns, K. J., & Erik Everhart, D. (2008). You bet: How personality differences affect risk-taking preferences. *Personality and Individual Differences, 44*(7), 1484–1494. https://doi.org/10.1016/j.paid.2008.01.005

Diener, E., & Fujita, F. (19950901). Resources, personal strivings, and subjective well-being: A nomothetic and idiographic approach. J*ournal of Personality and Social Psychology, 68*(5), 926. https://doi.org/10.1037/0022-3514.68.5.926

Kaufman, R (2020). "Different People Value Different Things" on The Four Categories of Value. (2020, January 23). Uplifting Service. https://www.upliftingservice.com/blog/different-people-value-different-things

Elliot, A. J. (1999). Approach and avoidance motivation and achievement goals. *Educational Psychologist, 34*(3), 169–189. https://doi.org/10.1207/s15326985ep3403_3

Elliot, A. J. (2006). The hierarchical model of approach-avoidance motivation. *Motivation and emotion, 30*(2), 111-116.

Elliot, A. J., Chirkov, V. I., Kim, Y., & Sheldon, K. M. (2001). A Cross-Cultural Analysis of

Avoidance (Relative to Approach) Personal Goals. *Psychological Science, 12*(6), 505–510. https://doi.org/10.1111/1467-9280.00393

Elliot, A. J., & Church, M. A. (1997). A hierarchical model of approach and avoidance achievement motivation. J*ournal of Personality and Social Psychology,* 218–232.

Elliot, A. J., Eder, A. B., & Harmon-Jones, E. (2013). Approach–Avoidance Motivation and Emotion: Convergence and Divergence. *Emotion Review, 5*(3), 308–311. https://doi.org/10.1177/1754073913477517

Elliot, A. J., & Gable, S. L. (2019). Functions and hierarchical combinations of approach and avoidance motivation. Psychological Inquiry, 30(3), 130-131. https://doi.org/10.1080/1047840X.2019.1646042

Elliot, A. J., & McGregor, H. A. (2001). A 2 × 2 achievement goal framework. *Journal of Personality and Social Psychology, 80*(3), 501–519. https://doi.org/10.1037/0022-3514.80.3.501

Engle, J., & Tinto, V. (2008). For further information contact: *The Pell Institute*, 38.

Förster, J., Higgins, E. T., & Idson, L. C. (1998). Approach and avoidance strength during goal attainment: regulatory focus and the" goal looms larger" effect. *Journal of personality and social psychology*, *75*(5), 1115-1131.

Freeman, M. A. (1997). Demographic Correlates of Individualism and Collectivism: A Study of Social Values in Sri Lanka. *Journal of Cross-Cultural Psychology, 28*(3), 321–341. https://doi.org/10.1177/0022022197283007

Frieze, I. H., Olson, J. E., & Good, D. C. (1990). Perceived and Actual Discrimination in the Salaries of Male and Female Managers1. *Journal of Applied Social Psychology, 20*(1), 46–67. https://doi.org/10.1111/j.1559-1816.1990.tb00377.x

Gray, J. A. (1990). Brain systems that mediate both emotion and cognition. *Cognition & emotion, 4*(3), 269-288.

Griskevicius, V., Tybur, J. M., Delton, A. W., & Robertson, T. E. (2011). The Influence of Mortality and Socioeconomic Status on Risk and Delayed Rewards: A Life History Theory Approach. *Journal of Personality and Social Psychology, 100*(6), 1015–1026. https://doi.org/10.1037/a0022403

Guerrero, M., & Rod, A. B. (2013). Engaging in Office Hours: A Study of Student-Faculty Interaction and Academic Performance. *Journal of Political Science Education, 9*(4), 403–416. https://doi.org/10.1080/15512169.2013.835554

Hamamura, T., Meijer, Z., Heine, S. J., Kamaya, K., & Hori, I. (2009). Approach—avoidance motivation and information processing: A cross-cultural analysis. *Personality and Social Psychology Bulletin, 35*(4), 454–462. https://doi.org/10.1177/0146167208329512

Hardie, S. M., & Wright, L. (2013). The relationship between Revised Reinforcement Sensitivity Theory (rRST), handedness and indecision. *Personality and Individual Differences, 55*(3), 312–316. https://doi.org/10.1016/j.paid.2013.03.004

Hayes, A. F. (2018). Introduction to mediation, moderation, and conditional process analysis: A regression-based approach. New York: The Guilford Press.

Heine, S. J., Kitayama, S., Lehman, D. R., Takata, T., Ide, E., Leung, C., & Matsumoto, H. (2001). Divergent consequences of success and failure in Japan and North America: An investigation of self-improving motivations and malleable selves. *Journal of Personality and Social Psychology, 81*(4), 599-615. https://doi.org/10.1037/0022-3514.81.4.599

Heine, S. J., & Lehman, D. R. (1995). Cultural variation in unrealistic optimism: Does the West feel more vulnerable than the East?. *Journal of Personality and Social Psychology, 68*(4), 595-607. https://doi.org/10.1037/0022-3514.68.4.595

Hickerson, C. A., & Giglio, M. (2009). Instant Messaging between Students and Faculty: A Tool for Increasing Student-Faculty Interaction. *International Journal on E-Learning, 8*(1), 71–88. https://www.learntechlib.org/primary/p/25264/

High-scoring, low-income students no more likely to complete college than low-scoring, rich students. (2012). Economic Policy Institute. Retrieved November 9, 2020, from https://www.epi.org/blog/college-graduation-scores-income-levels/

Hofstede, G. (1983). The Cultural Relativity of Organizational Practices and Theories. *Journal of International Business Studies, 14*(2), 75–89. https://doi.org/10.1057/palgrave.jibs.8490867

Jaffe, J. (2013, June 12). A juiced baseball scandal in Japan. Retrieved November 17, 2020, from https://www.si.com/mlb/2013/06/12/japan-juiced-baseballs

Jordan, D. (2018, November 20). Home runs and stri*keouts: Another look*. Society for American Baseball Research. https://sabr.org/journal/article/home-runs-and-strikeouts-another-look/

Kahneman, D., & Tversky, A. (2012). Prospect Theory: An Analysis of Decision Under Risk. In *Handbook of the Fundamentals of Financial Decision Making: Vol. Volume 4* (pp. 99–127). WORLD SCIENTIFIC. https://doi.org/10.1142/9789814417358_0006

Kanagaretnam, K., Lim, C. Y., & Lobo, G. J. (2014). Influence of National Culture on

Accounting Conservatism and Risk-Taking in the Banking Industry. *The Accounting Review*, *89*(3), 1115–1149. https://doi.org/10.2308/accr-50682

Keltner, D., Gruenfeld, D. H., Anderson, C., Keltner, D., Gruenfeld, D. H., & Anderson, C. (n.d.). *Power, Approach, and Inhibition*.

Kim, H. S., & Lawrie, S. I. (2019). Culture and motivation. In D. Cohen & S. Kitayama (Eds.), *Handbook of cultural psychology* (2nd ed.). New York: The Guilford Press.

Kim, D.-Y., & Lee, J.-H. (2011). Effects of the BAS and BIS on decision-making in a gambling task. *Personality and Individual Differences*, *50*(7), 1131–1135. https://doi.org/10.1016/j.paid.2011.01.041

Kim-Spoon, J., Deater-Deckard, K., Holmes, C., Lee, J., Chiu, P., & King-Casas, B. (2016). Behavioral and neural inhibitory control moderates the effects of reward sensitivity on adolescent substance use. *Neuropsychologia*, *91*, 318–326. https://doi.org/10.1016/j.neuropsychologia.2016.08.028

Kitayama, S., Markus, H. R., & Kurokawa, M. (2000). Culture, Emotion, and Well-being: Good Feelings in Japan and the United States. *Cognition & Emotion*, *14*(1), 93–124. https://doi.org/10.1080/026999300379003

Kraus, M. W., Côté, S., & Keltner, D. (2010). Social Class, Contextualism, and Empathic Accuracy. *Psychological Science*, *21*(11), 1716–1723. https://doi.org/10.1177/0956797610387613

Kreiser, P. M., Marino, L. D., Dickson, P., & Weaver, K. M. (2010). Cultural Influences on Entrepreneurial Orientation: The Impact of National Culture on Risk Taking and Proactiveness in SMEs. *Entrepreneurship Theory and Practice*, *34*(5), 959–983. https://doi.org/10.1111/j.1540-6520.2010.00396.x

Kuhn, A. (2015, August 28). *The secret to Japan's little league success: 10-hour practices*. North State Public Radio. https://www.mynspr.org/post/japans-little-league-teams-train-be-winners#stream/0

Lamoreaux, M., & Morling, B. (2012). Outside the head and outside individualism-collectivism: Further meta-analyses of cultural products. *Journal of Cross-Cultural Psychology*, *43*(2), 299-327. https://doi.org/10.1177/0022022110385234

Lapchick, R., Neelands, B., Estrella, B., Rainey, P., & Gerhart, Z. (2018, April 12). *The 2018 racial and gender report card: Major League Baseball*. TIDES The Institute for Diversity and Ethics in Sports. https://43530132-36e9-4f52-811a-182c7a91933b.filesusr.com/ugd/a4ad0c_45a59c127e964bb9a8b722267141e3fa.pdf

Lee, A. Y., Aaker, J. L., & Gardner, W. L. (2000). The pleasures and pains of distinct self-construals: The role of interdependence in regulatory focus. *Journal of Personality and Social Psychology*, *78*(6), 1122-1134. https://doi.org/10.1037/0022-3514.78.6.1122

Li, K., Griffin, D., Yue, H., & Zhao, L. (2013). How does culture influence corporate risk-taking? *Journal of Corporate Finance*, *23*, 1–22. https://doi.org/10.1016/j.jcorpfin.2013.07.008

Li, M., Lauharatanahirun, N., Steinberg, L., King-Casas, B., Kim-Spoon, J., & Deater-Deckard, K. (2019). Longitudinal link between trait motivation and risk-taking behaviors via neural risk processing. *Developmental Cognitive Neuroscience*, *40*, 100725. https://doi.org/10.1016/j.dcn.2019.100725

Lochbaum, M., Zanatta, T., & Kazak, Z. (2020). The 2 × 2 Achievement Goals in Sport and

Physical Activity Contexts: A Meta-Analytic Test of Context, Gender, Culture, and Socioeconomic Status Differences and Analysis of Motivations, Regulations, Affect, Effort, and Physical Activity Correlates. *European Journal of Investigation in Health, Psychology and Education*, *10*(1), 173–205. https://doi.org/10.3390/ejihpe10010015

Machen, S. M., Wilson, J. D., & Notar, C. E. (2005). Parental Involvement in the Classroom. *Journal of Instructional Psychology*, *32*(1), 13–16.

Mann, T., Sherman, D., & Updegraff, J. (2004). Dispositional Motivations and Message Framing: A Test of the Congruency Hypothesis in College Students. *Health Psychology : Official Journal of the Division of Health Psychology, American Psychological Association*, *23*(3), 330–334. https://doi.org/10.1037/0278-6133.23.3.330

Manstead, A. S. R. (2018). The psychology of social class: How socioeconomic status impacts thought, feelings, and behaviour. *British Journal of Social Psychology*, *57*(2), 267–291. https://doi.org/10.1111/bjso.12251

March, J. G., & Shapira, Z. (1987). Managerial Perspectives on Risk and Risk Taking. *Management Science*, *33*(11), 1404–1418. JSTOR. https://www.jstor.org/stable/2631920

Markus, H. R., & Kitayama, S. (1991). Culture and the self: Implications for cognition, emotion, and motivation. *Psychological Review*, *98*(2), 224-253. https://doi.org/10.1037/0033-295X.98.2.224

McNaughton, N., & Gray, J. A. (2000). Anxiolytic action on the behavioral inhibition system implies multiple types of arousal contribute to anxiety. *Journal of Affective Disorders, 61*(3), 161-176. https://doi.org/10.1016/S0165-0327(00)00344-X

Mienaltowski, A. (2011). Everyday problem solving across the adult life span: Solution diversity and efficacy. *Annals of the New York Academy of Sciences*, *1235*(1), 75–85. https://doi.org/10.1111/j.1749-6632.2011.06207.x

Mireles-Rios, R., & Romo, L. F. (2010). Maternal and Teacher Interaction and Student Engagement in Math and Reading Among Mexican American Girls From a Rural Community. *Hispanic Journal of Behavioral Sciences*, *32*(3), 456–469. https://doi.org/10.1177/0739986310374020

Morling, B., Kitayama, S., & Miyamoto, Y. (2002). Cultural Practices Emphasize Influence in the United States and Adjustment in Japan. *Personality and Social Psychology Bulletin*, *28*(3), 311–323. https://doi.org/10.1177/0146167202286003

Morling, B., & Lamoreaux, M. (2008). Measuring culture outside the head: a meta-analysis of individualism—collectivism in cultural products. *Personality and Social Psychology Review*, *12*(3), 199-221. https://doi.org/10.1177/1088868308318260

Nicholson, N., Soane, E., Fenton-O'Creevy, M., & Willman, P. (2005). Personality and domain-specific risk taking. *Journal of Risk Research*, *8*(2), 157–176. https://doi.org/10.1080/1366987032000123856

Oertig, D., Schüler, J., Schnelle, J., Brandstätter, V., Roskes, M., & Elliot, A. J. (2013). Avoidance Goal Pursuit Depletes Self-Regulatory Resources. *Journal of Personality*, *81*(4), 365–375. https://doi.org/10.1111/jopy.12019

Pampel, F. C., Krueger, P. M., & Denney, J. T. (2010). Socioeconomic Disparities in Health Behaviors. *Annual Review of Sociology*, *36*(1), 349–370. https://doi.org/10.1146/annurev.soc.012809.102529

Paravisini, D., Rappoport, V., & Ravina, E. (2017). Risk Aversion and Wealth: Evidence

from Person-to-Person Lending Portfolios. *Management Science*, *63*(2), 279–297. https://doi.org/10.1287/mnsc.2015.2317

Parker, A. M., & Fischhoff, B. (2005). Decision-making competence: External validation through an individual-differences approach. *Journal of Behavioral Decision Making*, *18*(1), 1–27. https://doi.org/10.1002/bdm.481

Pascarella, E. T., & Terenzini, P. T. (1991). *How College Affects Students: Findings and Insights from Twenty Years of Research*. Jossey-Bass Inc.

Pennebaker, J.W., Boyd, R.L., Jordan, K., & Blackburn, K. (2015). *The development and psychometric properties of LIWC2015*.Austin, TX: University of Texas at Austin.

Pfeffer, J. (19780101). Effects of an MBA and socioeconomic origins on business school graduates' salaries. *Journal of Applied Psychology*, *62*(6), 698. https://doi.org/10.1037/0021-9010.62.6.698

Piff, P. K., Kraus, M. W., Cheng, B. H., & Keltner, D. (n.d.). *Interpersonal Relations and Group Processes Having Less, Giving More: The Influence of Social Class on Prosocial Behavior*.

Population Characteristics: Educational Attainment in the United States: March 1997. (n.d.). 91.

Ratcliff, N., & Hunt, G. (2009). Building Teacher-Family Partnerships: The Role of Teacher Preparation Programs. *Education*, *129*(3), 495–505.

Roff, D. (1994). Charnov, E. L. 1993; Life History Invariants. Oxford University Press,

Oxford. xv + 167 pp., £13.50 (pbk). ISBN: 0-19-854072-8 (cloth). ISBN: 0-19-854071-X (paper). *Journal of Evolutionary Biology*, *7*(3), 399–400. https://doi.org/10.1046/j.1420-9101.1994.7030399.x

Sapp, D. A., & Simon, J. (2005). Comparing grades in online and face-to-face writing courses: Interpersonal accountability and institutional commitment. *Computers and Composition*, *22*(4), 471–489. https://doi.org/10.1016/j.compcom.2005.08.005

Savani, K., Hazel, M., & Conner, A. (2008). Let Your Preference Be Your Guide? Preferences and Choices Are More Tightly Linked for North Americans Than for Indians. *Journal of Personality and Social Psychology*, *95*(4), 861–876.

Schnelle, J., Brandstätter, V., & Knöpfel, A. (2010). The adoption of approach versus avoidance goals: The role of goal-relevant resources. *Motivation and Emotion*, *34*(3), 215–229. https://doi.org/10.1007/s11031-010-9173-x

Sheehy-Skeffington, J. (2020). The effects of low socioeconomic status on decision-making processes. *Current Opinion in Psychology*, *33*, 183–188. https://doi.org/10.1016/j.copsyc.2019.07.043

Sherman, D. K., Mann, T., & Updegraff, J. A. (2006). Approach/avoidance motivation, message framing, and health behavior: Understanding the congruency effect. *Motivation and Emotion*, *30*(2), 164–168. https://doi.org/10.1007/s11031-006-9001-5

Singelis, T. M., & Sharkey, W. F. (1995). Culture, Self-Construal, and Embarrassability. *Journal of Cross-Cultural Psychology*, *26*(6), 622–644. https://doi.org/10.1177/002202219502600607

Singh-Manoux, A., Marmot, M. G., & Adler, N. E. (2005). Does Subjective Social Status

Predict Health and Change in Health Status Better Than Objective Status? *Psychosomatic Medicine*, *67*(6), 855–861. https://doi.org/10.1097/01.psy.0000188434.52941.a0

Snibbe, A. C., & Markus, H. R. (2005). You Can't Always Get What You Want: Educational Attainment, Agency, and Choice. *Journal of Personality and Social Psychology*, *88*(4), 703–720. https://doi.org/10.1037/0022-3514.88.4.703

Stark, J. (2009, February 8). *A-Rod has destroyed game's history.* ESPN. https://www.espn.com/mlb/columns/story?columnist=stark_jayson&id=3892788

Stephens, N. M., Markus, H. R., & Townsend, S. S. M. (2007). Choice as an act of meaning: The case of social class. *Journal of Personality and Social Psychology*, *93*(5), 814–830. https://doi.org/10.1037/0022-3514.93.5.814

Taylor, R. N. (1975). Age and Experience as Determinants of Managerial Information Processing and Decision Making Performance. *The Academy of Management Journal*, *18*(1), 74–81. JSTOR. https://doi.org/10.2307/255626

Thaler, R. H., & Johnson, E. J. (1990). Gambling with the House Money and Trying to Break Even: The Effects of Prior Outcomes on Risky Choice. *Management Science*, *36*(6), 643–660. https://www.jstor.org/stable/2631898

Touré-Tillery, M., & Fishbach, A. (2011). The course of motivation. *Journal of Consumer Psychology*, *21*(4), 414-423.

Updegraff, J. A., Sherman, D. K., Luyster, F. S., & Mann, T. L. (2007). The effects of message quality and congruency on perceptions of tailored health communications. *Journal of Experimental Social Psychology*, *43*(2), 249–257. https://doi.org/10.1016/j.jesp.2006.01.007

Uskul, A. K., Sherman, D. K., & Fitzgibbon, J. (2009). The cultural congruency effect: Culture, regulatory focus, and the effectiveness of gain- vs. loss-framed health messages. *Journal of Experimental Social Psychology*, *45*(3), 535-541. https://doi.org/10.1016/j.jesp.2008.12.005

Van Leeuwen, A. P., Creemers, H. E., Verhulst, F. C., Ormel, J., & Huizink, A. C. (2011). Are Adolescents Gambling With Cannabis Use? A Longitudinal Study of Impulsivity Measures and Adolescent Substance Use: The TRAILS Study. *Journal of Studies on Alcohol and Drugs*, *72*(1), 70–78. https://doi.org/10.15288/jsad.2011.72.70

Watson, D., Anna, L., & Tellegen, A. (n.d.). *Development and Validation of Brief Measures of Positive and Negative Affect: The PANAS Scales*. 8.

Weinstein, N. D. (1980). Unrealistic optimism about future life events. *Journal of Personality and Social Psychology*, *39*(5), 806–820. https://doi.org/10.1037/0022-3514.39.5.806

Williams, C. T., & Latkin, C. A. (2007). Neighborhood Socioeconomic Status, Personal Network Attributes, and Use of Heroin and Cocaine. *American Journal of Preventive Medicine*, *32*(6, Supplement), S203–S210. https://doi.org/10.1016/j.amepre.2007.02.006

Xuan, X., Xue, Y., Zhang, C., Luo, Y., Jiang, W., Qi, M., & Wang, Y. (2019). Relationship among school socioeconomic status, teacher-student relationship, and middle school students' academic achievement in China: Using the multilevel mediation model. *PLOS ONE*, *14*(3), e0213783. https://doi.org/10.1371/journal.pone.0213783

Yount, E. (n.d.). How to beat the forces that keep low-income students from graduating.

Washington Post. Retrieved November 9, 2020, from http://www.washingtonpost.com/sf/business/2014/12/15/the-college-trap-that-keeps-people-poor/

Yuki, M., & Schug, J. (2012). Relational mobility: A socioecological approach to personal relationships. In O. Gillath, G. Adams, & A. Kunkel (Eds.), *Relationship science: Integrating evolutionary, neuroscience, and sociocultural approaches* (pp. 137-151). Washington, DC, US: American Psychological Association. https://doi.org/10.1037/13489-007

一般社団法人日本野球機構. (Nippon Professional Baseball.jp). Retrieved September 14, 2020, from http://npb.jp/

Appendix A

Study 1: Descriptive Statistics and ANOVA Tables for Home runs, Strikeouts, and Sacrifice Bunts

Table S1.
Mean Number of Home Runs Per Game in North America (MLB) and Japan (NPB) During the 2005-2019 Seasons.

	MLB		NPB		Difference	
Season	M	SD	M	SD	F (1, 37)	p
2005	1.03	0.22	1.03	0.22	0.001	.97
2006	1.11	0.16	0.86	0.17	20.68	<.001
2007	1.02	0.19	0.84	0.19	7.41	.01
2008	1.00	0.21	0.86	0.27	3.26	.08
2009	1.04	0.21	0.89	0.17	6.08	.02
2010	0.96	0.20	0.93	0.26	0.16	.69
2011	0.95	0.21	0.54	0.13	37.43	<.001
2012	1.02	0.21	0.51	0.09	75.67	<.001
2013	0.96	0.16	0.76	0.14	17.21	<.001
2014	0.86	0.16	0.79	0.17	1.66	.21
2015	1.00	0.18	0.71	0.15	24.85	<.001
2016	1.15	0.20	0.78	0.16	34.36	<.001
2017	1.25	0.17	0.87	0.16	43.81	<.001
2018	1.14	0.20	0.98	0.30	4.26	.046
2019	1.38	0.25	0.98	0.26	20.28	<.001

Table S2.
Full Results of Home Run ANOVA

	df	F	p	η^2_p
Culture	(1, 37)	36.84	<.001	.50
Season	(14, 518)	17.55	<.001	.32
League	(1, 37)	0.13	.717	.004
Culture x Season	(14, 518)	7.19	<.001	.16
Culture x League	(1, 37)	2.64	.113	.07
Season x League	(14, 518)	1.29	.210	.03
Season x Season x League	(14, 518)	0.62	.847	.02

Table S3.
Mean Number of Strikeouts Per Game in the MLB and the NPB During the 2005-2019 Seasons.

	MLB		NPB		Difference	
Season	M	SD	M	SD	*F* (1, 37)	*p*
2005	6.30	0.62	6.92	0.62	9.24	.004
2006	6.51	0.72	6.80	0.30	1.93	.17
2007	6.62	0.83	6.71	0.51	0.10	.75
2008	6.78	0.74	6.68	0.61	0.15	.71
2009	6.94	0.58	6.87	0.50	0.13	.72
2010	8.09	0.93	6.89	0.32	39.88	< .001
2011	7.10	0.68	6.67	0.48	3.97	.05
2012	7.46	0.57	6.24	0.43	44.54	< .001
2013	7.48	0.63	6.70	0.55	13.51	< .001
2014	7.66	0.65	6.92	0.82	9.83	.003
2015	8.09	0.84	6.93	0.63	30.40	< .001
2016	8.00	0.73	7.03	0.53	17.33	< .001
2017	8.31	0.71	7.37	0.32	17.71	< .001
2018	8.51	0.59	7.27	0.56	38.86	< .001
2019	8.87	0.62	7.60	0.46	40.51	< .001

Table S4.
Full Results of Strikeout ANOVA

	df	F	*p*	η^2_p
Culture	(1, 37)	37.26	<.001	.50
Season	(14, 518)	27.46	<.001	.43
League	(1, 37)	2.55	.120	.06
Culture x Season	(14, 518)	10.28	<.001	.22
Culture x League	(1, 37)	0.98	.330	.03
Season x League	(14, 518)	2.36	.004	.06
Culture x Season x League	(14, 518)	1.72	.049	.04

Table S5.
Mean Number of Sacrifice Bunts Per Game in North America (MLB) and Japan (NPB) During the 2005-2019 Seasons.

	MLB		NPB		Difference	
Season	M	SD	M	SD	F (1, 37)	p
2005	0.33	0.14	0.60	0.13	67.40	<.001
2006	0.33	0.15	0.78	0.18	119.60	<.001
2007	0.31	0.11	0.85	0.16	271.32	<.001
2008	0.31	0.11	0.88	0.20	218.93	<.001
2009	0.33	0.15	0.84	0.16	170.49	<.001
2010	0.31	0.11	0.87	0.19	171.18	<.001
2011	0.34	0.12	1.03	0.14	461.16	<.001
2012	0.30	0.11	0.98	0.14	476.30	<.001
2013	0.28	0.11	0.90	0.13	436.38	<.001
2014	0.28	0.10	0.94	0.16	451.38	<.001
2015	0.25	0.09	0.81	0.09	567.99	<.001
2016	0.21	0.09	0.80	0.22	265.80	<.001
2017	0.19	0.10	0.77	0.16	321.52	<.001
2018	0.17	0.08	0.65	0.14	251.77	<.001
2019	0.16	0.09	0.65	0.08	395.27	<.001

Table S6.
Full Results of Sacrifice Bunt ANOVA

	df	F	p	η^2_p
Culture	(1, 37)	1112.81	<.001	.97
Season	(14, 518)	28.24	<.001	.43
League	(1, 37)	27.25	<.001	.42
Culture x Season	(14, 518)	11.75	<.001	.24
Culture x League	(1, 37)	29.92	<.001	.45
Season x League	(14, 518)	3.97	<.001	.10
Culture x Season x League	(14, 518)	3.30	<.001	.08

Study 1: Additional Analyses Excluding Seasons 2011 and 2012 on Home runs, Strikeouts, and Sacrifice Bunts

The Nippon Professional Baseball changed their ball configurations in 2011 in such a way that may have led to reduced home run production (Jaffe, 2013) but then changed again in 2013 to increase home run production (Bangkok Post, 2013; Brisbee, 2013). Below, we report additional analyses that omit 2011 and 2012 seasons. Results remained consistent with our hypotheses.

Home runs. To test the difference in home runs between US and Japanese baseball teams, a 2 (culture: North America vs. Japan) x 2 (League: with DH rule vs. no DH rule) x 13 (seasons) mixed model ANOVA was performed on the mean number of home runs per game. As expected, the main effect of culture was significant, $F(1, 37) = 27.78$, $p < .001$, $\eta^2_p = .43$, 95% CI [0.16, 0.64]. The mean number of home runs was significantly higher in the North America ($M = 1.07$, $SD = 0.23$) than in Japan ($M = 0.87$, $SD = 0.22$).

The main effect of season was significant, $F(12, 444) = 11.62$, $p < .001$, $\eta^2_p = .24$, 95% CI [0.16, 0.28]. There was no significant effect of league adopting the DH rule, $F(1, 37) = 0.05$, $p = .817$, $\eta^2_p = .002$. Furthermore, the culture x season interaction was significant, $F(12, 444) = 5.00$, $p < .001$, $\eta^2_p = .12$, 95% CI [0.07, 0.15]. The league x season interaction, $F(12, 444) = 1.34$, $p = .19$, $\eta^2_p = .04$, the culture x league interaction, $F(1, 37) = 2.47$, $p = .124$, $\eta^2_p = .06$, and the culture x league x season interaction, $F(12, 444) = 0.66$, $p = .79$, $\eta^2_p = .02$, were not significant.

Strikeouts. A 2 (culture: North America vs. Japan) x 2 (League: with DH rule vs. no DH rule) x 13 (seasons) mixed model ANOVA was performed on the mean number of strike-out per game. The main effect of culture was significant, $F(1, 37) = 29.46$, $p < .001$, $\eta^2_p = .44$, 95% CI [0.24, 0.61]. The mean number of strike-out per game was larger in North America ($M = 7.55$, $SD = 1.07$) than in Japan ($M = 6.98$, $SD = 0.58$).

Either the main effect of league adopting the DH rule ($F(1, 37) = 2.05$, $p = .16$, $\eta^2_p = .05$) or the interaction between culture and league ($F(1, 37) = 0.75$, $p = .39$, $\eta^2_p = .02$) was not significant. The main effect of season was significant, $F(12, 444) = 29.53$, $p < .001$, $\eta^2_p = .44$, 95% CI [0.36, 0.49]. The culture x season interaction was also significant, $F(12, 444) = 11.03$, $p < .001$, $\eta^2_p = .23$, 95% CI [0.15, 0.28]. Additionally, both the league x season

interaction ($F(12, 444) = 2.73$, $p = .001$, $\eta^2_p = .07$, 95% CI [0.03, 0.09]) and the culture x league x season interaction ($F(12, 444) = 1.95$, $p = .03$, $\eta^2_p = .05$, 95% CI [0.02, 0.07]) were significant.

Sacrifice bunts. A 2 (culture: North America vs. Japan) x 2 (League: with DH rule vs. no DH rule) x 13 (seasons) mixed model ANOVA was performed on the mean number of sacrifice bunts per game. As hypothesized, there was a main effect of culture, $F(1, 37) = 905.60$, $p < .001$, $\eta^2_p = .96$, 95% CI [0.94, 0.97]. The mean number of sacrifice bunts was significantly higher in Japan ($M = 0.80$, $SD = 0.18$) than in North America ($M = 0.27$, $SD = 0.12$).

There were main effects of league adopting the DH rule, $F(1, 37) = 21.91$, $p < .001$, $\eta^2_p = .37$, 95% CI [0.06, 0.62], and season, $F(12, 444) = 22.09$, $p < .001$, $\eta^2_p = .37$, 95% CI [0.28, 0.43]. Furthermore, the culture x season interaction $F(12, 444) = 10.03$, $p < .001$, $\eta^2_p = .21$, 95% CI [0.17, 0.23], the culture x league interaction, $F(1, 37) = 26.08$, $p < .001$, $\eta^2_p = .41$, 95% CI [0.12, 0.63], and the league x season interaction, $F(12, 444) = 4.47$, $p < .001$, $\eta^2_p = .11$, 95% CI [0.04, 0.15], were all significant. The culture x league x season interaction was also significant, $F(12, 444) = 3.84$, $p < .001$, $\eta^2_p = .09$, 95% CI [0.04, 0.12].

Study 1: Additional Data and Analyses on Home runs, Strikeouts, and Sacrifice Bunts from International Competitions

We conducted additional analyses to examine whether our predictions about home runs, strike outs, and sacrifice bunts would hold in international baseball tournaments, where the balls and stadiums were identical among participating teams. We collected data from a total of 10 tournaments: 4 Olympics (1992, 1996, 2000 and 2008), 4 World Baseball Classics

(2006, 2009, 2013, 2017), and 2 Premier 12 (2015 and 2019). 2004 Olympics was not included in the analysis as the U.S. did not qualify for it. We were unable to find the number of sacrifice bunts by the U.S. in 1992 and 1996 Olympics, therefore, while 10 tournaments were analyzed for home runs and strike outs, only 8 tournaments were analyzed for sacrifice bunts. See Table S7 for data:

Table S7.
Number of home runs, strike outs and sacrifice bunts by Japan and U.S. during international tournaments

event	year	JpnGame	USGame	JpnHR	USHR	JpnSO	USSO	JpnSB	USSB
olympic	**1992**	9	9	12	6	49	62	12	
olympic	**1996**	9	9	26	32	68	76	2	
olympic	**2000**	9	9	7	8	60	67	11	0
olympic	**2008**	9	9	7	10	58	80	8	3
wbc	**2006**	8	6	10	9	39	26	9	2
wbc	**2009**	9	8	4	12	53	50	7	1
wbc	**2013**	7	6	8	1	37	46	6	3
wbc	**2017**	7	8	11	8	41	62	9	0
premier	**2015**	8	8	9	3	38	66	6	2
premier	**2019**	8	8	4	15	50	70	2	3

Note. The table lists the number of games played (Game), home runs (HR), strike outs (SO), and sacrifice bunts (SB), for Japan (Jpn) and the U.S. (US) during each tournament.

A total of 28 comparisons were made. The results indicated that 22 out of 28 comparisons were in the predicted direction ($z = 3.02$, $p = .003$). The U.S. hit more home runs than Japan in 6 out of 10 tournaments ($z = 0.63$, $p = .53$); the U.S. were struck out more than Japan in 9 out of 10 tournaments ($z = 2.53$, $p = .011$); Japan hit more sacrifice bunts than the U.S. in 7 out of 8 tournaments ($z = 2.12$, $p = .033$). We also conducted paired t-tests which confirmed that the differences were significant for strikeouts, paired-t (9) = 4.10, p = .003, and sacrifice bunts, paired-t (7) = 4.04, p = .005, but not for home runs, paired-t (9) = .32, p = .75. Although the strength of the result for home runs was unexpected, overall,

most comparisons were in line with our prediction providing additional support for our hypothesis.

Study 2: Strategic Decision Index Pretest in America and Japan

We pre-tested the Strategic Decision Index in America and Japan. The pre-tests were conducted by first introducing approach and avoidance motivations to the participants. They read the passage "Approach motivation indicates a tendency to move toward (or maintain contact with) a desired/positive stimulus. For example, I study hard to get a good grade is approach motivation. Avoidance motivation indicates a tendency to move away from (or maintain distance from) an undesired/negative stimulus. For example, I study hard to avoid getting a bad grade is avoidance motivation." We then randomly assigned participants to read "Tim is a person with a strong approach (or avoidance) motivation, please answer the following questions about baseball strategies." Afterwards, participants were presented with baseball scenarios involving Tim, and asked to make decisions based on Tim's motivational orientation (e.g., "Imagine Tim is the coach and it's the bottom of the eighth inning. Tim's runner on first base has average performance in stealing. Tim's team is down by 1 run, and there are 2 outs. If the runner attempts to steal a base but fails, the inning will end; if the steal succeeds, the runner will be in scoring position, and your team will need just one hit to score. If Tim were choosing consistent with his approach (or avoidance) motivation, would Tim have the player attempt to steal or not?"). We asked the participant to take a third person's perspective because we wanted to minimize the effect of the participant's own motivational orientation on their responses. There were a total of 10 baseball scenarios in our pre-tests that we created to pose a difference between high risk/high reward vs. low risk / low reward outcomes. We expected that those who read Tim is a person with strong approach (or

avoidance) motivation would be more likely to make high risk/high reward (or low-isk/low award) oriented decisions for Tim accordingly. We conducted Chi-square tests to assess the validity of these items. The American pre-test (N =32) showed that 1 item was ineffective; Japanese pre-test (N = 27) suggested that 2 items were ineffective, including the same item as the American pre-test. Based on the results, we selected 8 items for our main study (see Table S8 and S9).

Table S8.
Frequency breakdown of each scenario pretested in the United States. Refer to main text for description of A to H scenario.

Scenario	Approach /Avoidance	High risk-high payoff	Low risk-low payoff	Chi-square p-value (one tailed)
A	Approach	15	1	.001
	Avoidance	6	10	
B	Approach	20	1	<.001
	Avoidance	2	9	
C	Approach	13	3	.068
	Avoidance	8	8	
D	Approach	12	4	.002
	Avoidance	5	11	
E	Approach	16	4	<.001
	Avoidance	1	11	
F	Approach	14	3	.001
	Avoidance	3	12	
G	Approach	17	2	<.001
	Avoidance	1	12	
H	Approach	18	4	<.001
	Avoidance	0	10	
Deleted A	Approach	13	5	.302
	Avoidance	8	6	
Deleted B	Approach	17	7	.006
	Avoidance	1	7	

Note. The pretest in America showed that item Deleted A was ineffective and item C was marginal. Item Deleted A was "Imagine Tim is the coach. Tim's pitcher had done a good job in the past 5 innings, allowing the opponent only 1 run. Tim's team has scored 1 run as well. Now it's the bottom of the 5th inning with 2 outs. Tim's team is batting and the bases are loaded, his pitcher who has a very low batting average is up next. If Tim were choosing consistent with his approach/avoidance motivation, would Tim pinch hit for the pitcher, which meant take the pitcher out of the game so a better hitter can bat (high risk-high payoff), or would Tim allow the pitcher to bat, which meant allow the pitcher to continue pitching later (low risk-low payoff)?"

Table S9.
Frequency breakdown of each scenario pretested in Japan. Refer to main text for description of A to H scenario.

Scenario	Approach /Avoidance	High risk-high payoff	Low risk-low payoff	Chi-square p-value (one tailed)
A	Approach	13	3	<.001
	Avoidance	0	11	
B	Approach	16	0	<.001
	Avoidance	0	11	
C	Approach	12	4	<.001
	Avoidance	0	11	
D	Approach	15	1	<.001
	Avoidance	0	11	
E	Approach	14	2	.002
	Avoidance	3	8	
F	Approach	12	4	.001
	Avoidance	0	11	
G	Approach	14	0	<.001
	Avoidance	1	12	
H	Approach	13	1	<.001
	Avoidance	0	13	
Deleted A	Approach	10	6	.315
	Avoidance	5	6	
Deleted B	Approach	11	3	.171
	Avoidance	7	6	

Note. The pretest in Japan showed that item Deleted A and Deleted B were ineffective. Item Deleted B was "Imagine Chris is the coach. His closer has pitched in the last 2 games of the series and recorded a save in each. It is the bottom of the 9th inning and Chris' team is leading by 2. If Chris were choosing consistent with his approach/avoidance motivation, would Chris bring in his closer for the third day in a row to try to get the save (high risk-high payoff), or bring in a different relief pitcher who is not as good (low risk-low payoff)?"

Study 2: Pilot Study of Motivation Predicting Strategic Decision-Making

We conducted a pilot study in the U.S. to examine if approach/avoidance motivation predicted baseball strategic decision-making, using a subset (4 out of 8) of our baseball strategic decision-making items. With 77 participants, we conducted non-parametric correlation tests. We found that BAS positively correlated with baseball strategic decision-making (r_s (75) = .29, p = .009), suggesting that more approach motivated people made more approach decisions. There was a marginal negative correlation between BIS and baseball

strategic decision-making (r_s (75) = -.21, p = .068), suggesting that more avoidance motivated people made more avoidance decisions. Using the average of the effect sizes we found (.25), we conducted an a priori power analysis (two tailed, α = .05,). To achieve a power of .80, we will need at least 120 participants. Given that we are less familiar with Japanese participants' characteristics, we set out to collect data from 200 Americans and 200 Japanese, which, keeping all criterion consistent, would allow us to detect an effect size of .20 between approach/avoidance motivation and baseball strategic decision-making.

Study 2: Approach or Avoidance Motivation as the Sole Mediator

To test the mediating role of approach and avoidance motivation, we regressed Strategic Decision Index on culture and approach or avoidance motivation. As predicted, those who scored higher on avoidance motivation made more low risk/low payoff strategic choices, (β = -.11, b = -.28, SE = .11, p = .010, 95% CI = [-.49, -.07]). In addition, the association between culture and Strategic Decision Index observed in the first equation became non-significant, (β = .07, b = .11, SE = .07, p = .085, $95\%CI$ = [-.02, .24]). The indirect effect of culture on the Strategic Decision Index through avoidance motivation was significant (b = .04, SE = .02, $95\%CI$ = [.007, .076]). Thus, the link between culture and the Strategic Decision Index in baseball was mediated by avoidance motivation (see Fig. S1).

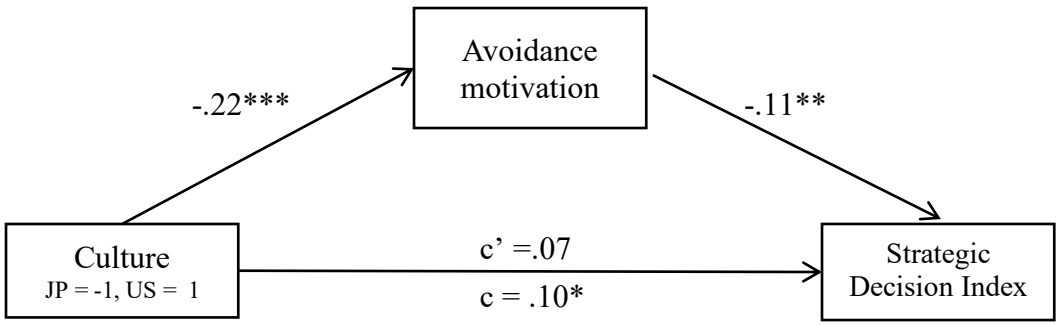


Figure S1. Mediation model of Strategic Decision Index on culture mediated by avoidance motivation. Coefficients are standardized, *p < .05, **p < .01, ***p < .001

Those who scored higher on approach motivation made more high risk/high payoff strategic choices, (β = .12, b = .43, SE = .12, p = .004, 95% CI = [.15, .73]). The association between culture and the Strategic Decision Index observed in the first equation became non-significant, (β = .08, b = .12, SE = .13, p = .062, $95\%CI$ = [-.006, .250]). The indirect effect of culture on the Strategic Decision Index through approach motivation was significant (b = .03, SE = .01, $95\%CI$ = [.008, .063]). Therefore, the link between culture and the Strategic Decision Index was mediated by approach motivation (see Fig. S2). There was no significant difference between the strength of the two indirect effects (b = .01, SE = .02, $95\%CI$ = [-.031, .050]).

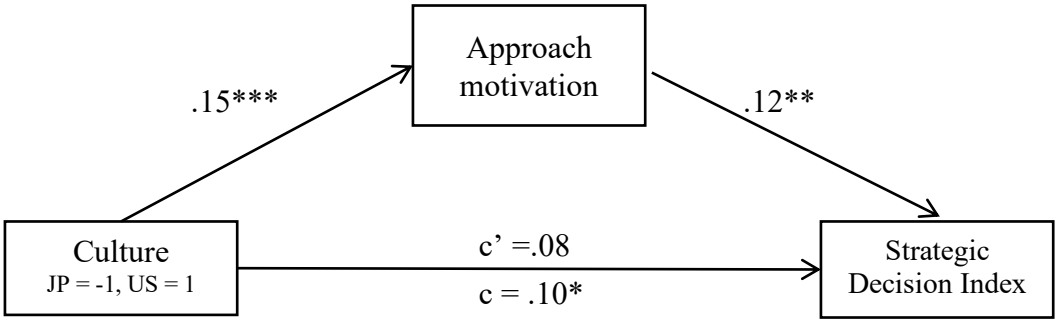


Figure S2. Mediation model of Strategic Decision Index on culture mediated by approach motivation. Coefficients are standardized, *p < .05, **p < .01, ***p < .001

Study 2: Measurement Equivalence of BIS/BAS Scale Across Cultures

We conducted a multigroup confirmatory factor analysis to examine measurement invariance regarding the BIS/BAS scales across the two cultural groups by using the lavaan package in R. Because the chi-square test is sensitive to the sample size, here we focused on the differences of the comparative fit index (CFI) and the root mean square error of approximation (RMSEA). If CFI is above 0.95, the model indicates good fit. If RMSEA is

less than 0.08, the model is acceptable. When the differences of CFI and RMSEA between models are less than 0.01, they indicate measurement invariance (Fischer & Karl, 2019). For BIS, configural invariance was confirmed based on the CFI value, df = 28, χ^2 = 81.58, p < .001, CFI = 0.965, RMSEA = 0.081. Metric invariance was then tested by a model constraining factor loadings equal across the cultural groups (df = 34, χ^2 = 105.85, p < .001, CFI = 0.952, RMSEA = 0.085) and was established based on the RMSEA value (CFI difference = 0.013, RMSEA difference = 0.004). However, in case of a model further constraining intercepts equal across the cultural groups (df = 40, χ^2 = 185.62, p < .001, CFI = 0.904, RMSEA = 0.111), the differences did not bear the criteria (CFI difference = 0.048, RMSEA difference = 0.026). Thus, scalar invariance was not achieved. For BAS, because the model of configural invariance did not fit well when one factor model was assumed (df = 130, χ^2 = 879.07, p < .001, CFI = 0.701, RMSEA = 0.140), we reexamined it by entering the three factors (reward responsiveness, drive, and fun seeking). Although CFI was still low, the model was relatively acceptable (df = 124, χ^2 = 376.64, p < .001, CFI = 0.899, RMSEA = 0.083). By comparing it with a model constraining factor loadings equal across the cultural groups (df = 134, χ^2 = 402.80, p < .001, CFI = 0.893, RMSEA = 0.083), the differences fulfilled the criteria (CFI difference = 0.006, RMSEA difference = 0.001). Thus, metric invariance was confirmed. In contrast, the differences from a model further constraining intercepts equal across the cultural groups (df = 144, χ^2 = 614.43, p < .001, CFI = 0.812, RMSEA = 0.106) did not bear the criteria (CFI difference = 0.081, RMSEA difference = 0.023). In summary, for both BIS and BAS (reward responsiveness, drive, and fun seeking), evidence of configural and metric invariance was found.

Bangkok Post Publication Limited. (2013, June 12). Japan baseball chiefs admit lying over ball change. Retrieved November 17, 2020, from https://www.bangkokpost.com/sports/354749/japan-baseball-chiefs-admit-lying-over-ball-change

Brisbee, G. (2013, June 12). Japan admits to juicing balls. Retrieved November 28, 2020, from https://www.sbnation.com/hot-corner/2013/6/12/4424132/japan-npb-juicing-balls

Fischer, R., & Karl, J. A. (2019). A primer to (cross-cultural) multi-group invariance testing possibilities in R. *Frontiers in Psychology*, *10*, 1-18. https://doi.org/10.3389/fpsyg.2019.01507

Jaffe, J. (2013, June 12). A juiced baseball scandal in Japan. Retrieved November 17, 2020, from https://www.si.com/mlb/2013/06/12/japan-juiced-baseballs

Appendix B: Approach and Avoidance Motivation (BIS/BAS Scale)

In the first part of the study, we are going to ask you some questions about yourself.

Each item of this questionnaire is a statement that a person may either agree with or disagree with. For each item, indicate how much you agree or disagree with what the item says. Please respond to all the items; do not leave any blank. Choose only one response to each statement. Please be as accurate and honest as you can be. Respond to each item as if it were the only item. That is, don't worry about being "consistent" in your responses.

Choose from the following four response options: 1 = Very false for me, 2 = Somewhat false for me, 3 = Somewhat true for me, 4 = Very true for me

1. A person's family is the most important thing in life.
2. Even if something bad is about to happen to me, I rarely experience fear or nervousness.
3. I go out of my way to get things I want.
4. When I'm doing well at something I love to keep at it.
5. I'm always willing to try something new if I think it will be fun.
6. How I dress is important to me.
7. When I get something I want, I feel excited and energized.
8. Criticism or scolding hurts me quite a bit.
9. When I want something I usually go all-out to get it.
10. I will often do things for no other reason than that they might be fun.
11. It's hard for me to find the time to do things such as get a haircut.
12. If I see a chance to get something I want I move on it right away.
13. I feel pretty worried or upset when I think or know somebody is angry at me.
14. When I see an opportunity for something I like I get excited right away.

15. I often act on the spur of the moment.

16. If I think something unpleasant is going to happen I usually get pretty "worked up."

17. I often wonder why people act the way they do.

18. When good things happen to me, it affects me strongly.

19. I feel worried when I think I have done poorly at something important.

20. I crave excitement and new sensations.

21. When I go after something I use a "no holds barred" approach.

22. I have very few fears compared to my friends.

23. It would excite me to win a contest.

24. I worry about making mistakes.

Appendix C: Demographic Questionnaire (Chapter 1 Study 2)

What country were you born in?

What country did you spend the majority of your life in?

Please indicate your gender?

Male, female, other

Please indicate your ethnicity.

Asian; Asian-America

Black; African-American

Hispanic; Latino-American

Native American

Native Pacific Islander

White; Caucasian-American

Other (please specify)

What is your age?

In general, how would you describe your own political view?

Very conservative

Conservative

Moderate

Liberal

Very liberal

What is the your highest level of education?

Did not graduate high school

High school graduate

Some college, but no degree

2-year college degree

4-year college degree

Postgraduate degree (MA, MBA, MD, PhD, JD, etc.)

How long has it been since you first started watching baseball? (in years)

On average, how often do you watch baseball during baseball season?

Less than once a month

Once a month

2-3 times a month

Once a week

2-3 times a week

More than 3 times a week

Appendix D: Achievement Goals Questionnaire

The following statements are about your goal (or goals) for your classes, as well as other thoughts and feelings regarding your classes in the **upcoming quarter/semester**. Please read each statement carefully before responding 1 = not true at all of me, 4 = somewhat true of me, 7 = very true of me

1. This upcoming semester/quarter, I want to learn as much as possible.
2. This upcoming semester/quarter, it is important for me to avoid doing poorly compared to other students.
3. My goal this upcoming semester/quarter is to avoid learning less than I possibly could.
4. This upcoming semester/quarter, I want to do well compared to other students.
5. This upcoming semester/quarter, it is important for me to understand the content of my courses as thoroughly as possible.
6. My goal this upcoming semester/quarter is to avoid performing worse than other students.
7. This upcoming semester/quarter, it is important for me to avoid an incomplete understanding of the course material.
8. This upcoming semester/quarter, it is important for me to do better than other students.
9. My goal this upcoming semester/quarter is to completely master the material presented in my classes.
10. This upcoming semester/quarter, I want to avoid performing poorly compared to others.
11. This upcoming semester/quarter, I want avoid learning less than it is possible to learn.
12. My goal this upcoming semester/quarter is to perform better than the other students.

Appendix E: Demographic Questionnaire (Chapter 2 Study 1 & 2)

Please indicate your gender

Male

Female

Other (please specify)

Please indicate your ethnicity

Asian; Asian-American

Black; African-American

Hispanic; Latino-American

Native American

Native Pacific Islander

White; Caucasian-American

Other (please specify)

What is your age?

What is your current GPA?

What is your major or intended major?

What is the college that you currently attend? (only for Study 1)

What is your mother's (guardian 1's) highest level of education?

Did not graduate high school

High school graduate

Some college, but no degree

2-year college degree

4-year college degree

Postgraduate degree (MA, MBA, MD, PhD, JD, etc.)

What is your father's (guardian 2's) highest level of education?

Did not graduate high school

High school graduate

Some college, but no degree

2-year college degree

4-year college degree

Postgraduate degree (MA, MBA, MD, PhD, JD, etc.)

How satisfied or unsatisfied are you with your college experience so far?

Very unsatisfied

Unsatisfied

Neither unsatisfied nor satisfied

Satisfied

Very satisfied

What is your average family annual income in the past 5 years?

Under $19,999

$20,000 - $39,999

$40,000 - $59,999

$60,000 - $79,999

$80,000 - $99,999

$100,000 - $119,999

$120,000 - $139,999

$140,000 - $159,999

$160,000 - $179,999

$180,000 - $199,999

$200,000 or more

In general, how would you describe your own political view?

Very liberal

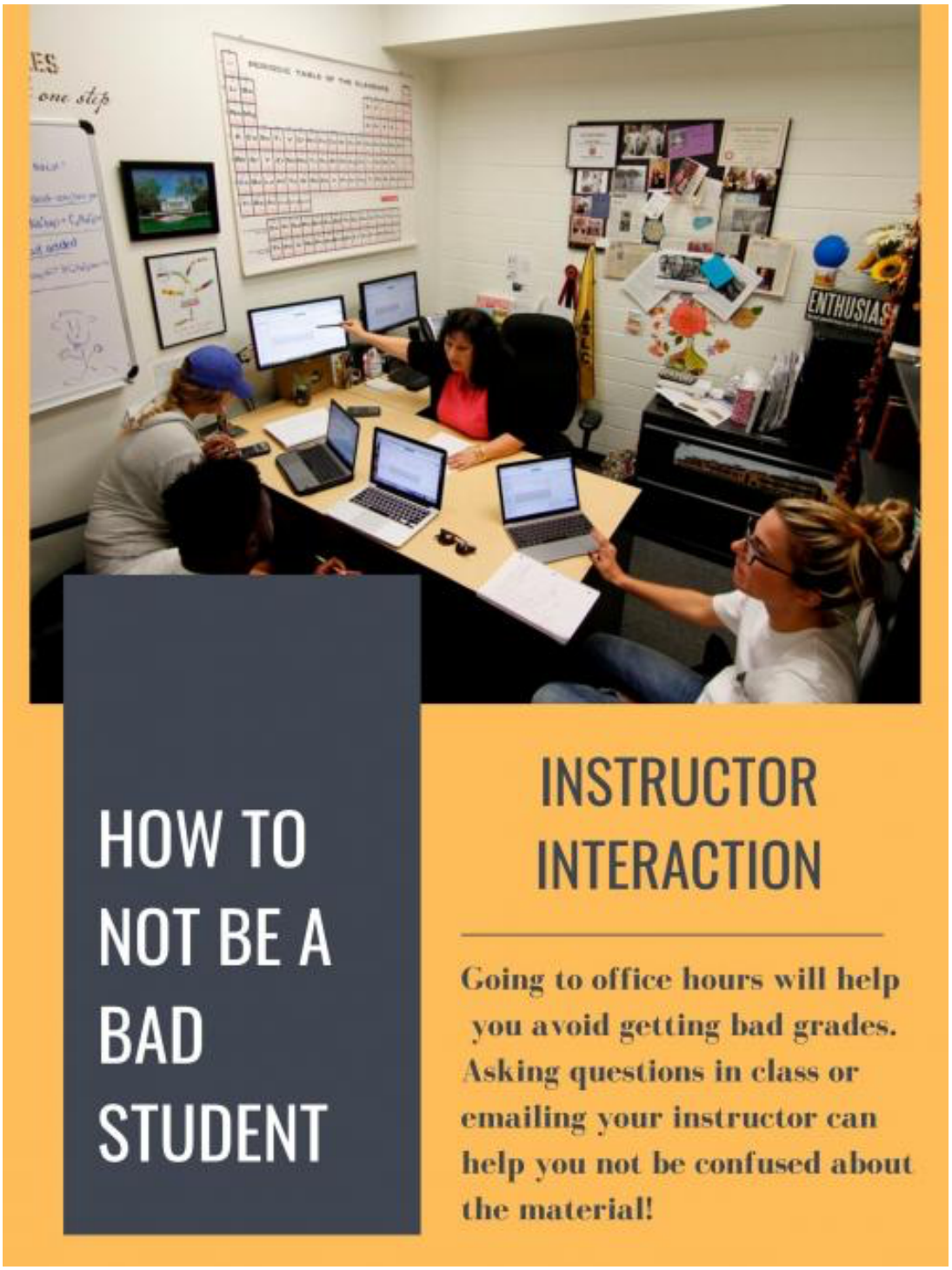
Liberal

Moderate

Conservative

Very conservative

Appendix F: Interaction with Instructors Flyer



HOW TO BE A GOOD STUDENT

INSTRUCTOR INTERACTION

Going to office hours will help improve your grade. Asking questions in class or emailing your instructor can help you better understand the material!

Appendix G: Academic Related Interactions Measure

Which of the following interactions have you had since you last filled out the survey for this study? (select all that apply)

Went to TA's (virtual) office hour

Went to professor's (virtual) office hour

Asked a question during lecture/lab/section/seminar

Emailed a professor

Emailed a TA

Scheduled an appointment with professor/TA

Attended department's tutor room

Attended CLAS Virtual Group tutorials

Attended CLAS Study Hall

Scheduled a CLAS writing appointment

Scheduled a CLAS language appointment

Appendix H: Ability Uncertainty Questionnaire

Please indicate to what extent you agree or disagree with the statements below. 1 = Strongly disagree, 2 = Disagree, 3 = Somewhat disagree, 4 = Somewhat agree, 5 = Agree, 6 = Strongly agree

1. I worry my abilities aren't good enough to do well in my (intended) major.
2. I often wonder if I have what it takes to succeed in my (intended) major.
3. I feel confident about my abilities in my (intended) major.
4. I sometimes feel like other students in my (intended) major have skills that I don't.
5. When I'm doing work in my (intended) major, I feel a sense of competence.
6. My(intended) major requires some abilities that I'm not sure I possess.
7. I worry that no matter how hard I try, I won't be able to perform successfully in my (intended) major.
8. When doing work in my (intended) major, I feel I have the skills that I need.
9. I'm not sure that I'm cut out for my (intended) major.
10. I have no doubts that I possess or can acquire the abilities my (intended) major requires.
11. I feel similar to the kinds of people who have what it takes to succeed in my (intended) major.
12. I'm not certain I “fit in” intellectually in my (intended) major.