

ESSAYS IN SOCIAL NETWORKS, RISK  
PERCEPTION AND POLICY PREFERENCES:  
EXPERIMENTAL EVIDENCE IN RISKY  
ENVIRONMENTS

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Juan Fernando Plascencia Guzman

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ESSAYS IN SOCIAL NETWORKS, RISK PERCEPTION AND POLICY  
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Juan Fernando Plascencia Guzman, Ph.D.  
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There is a growing interest in the literature that focuses on the relationship between individual's attitudes towards risk, the use of social technologies, and their response to a crisis. Some of the findings on the impact of terrorism on the psychological well-being suggest that it takes more than one agent (e.g. threat to life) to provoke psychopathology. This dissertation contributes to the study of Economics of Crime by incorporating cutting-edge methods of Behavioral Economics & Social Networks. In the first chapter, by using an online experimental survey anchored on stated preferences as an index based, we capture people's stated preferences in locations considered as risky environments in Mexico. We use personal and policy hypothetical scenarios (Benjamin et al.2014) to capture 259 respondents' preferences, we found evidence of negative well-being aspects such as anger, anxiety, and depression in addition to capturing policy preferences in violent and non-violent locations. On the second chapter, by using a network instrument and subjective well-being data -10,400 respondents INEGI 2012 (Mexico)-, we analyze homophily differences by using log-linear models. The analysis is made within and between groups by fitting layer effect parameters. The results of how personal characteristics relate to differences in strength of homophily and people's self-reported level of happiness indicates that residents in violent & non-violent places are almost equally homophilous to affiliate or having support from a specific social network, although the strength in involvement in a social network show proportional differences based on education, marital status, which result in a tendency to form ties is based on that particular locus. The third chapter aboard the study of risk perception and policy preferences, by implementing an online experiment in Mexico to prove two hypotheses. The first hypothesis-appraisal-tendency theory- is used to test the behavior of 111 respondents. We found that an anger treatment triggered in one situation evokes optimistic risk estimates and risk-seeking choices. A fear treatment does the opposite, evoking pessimistic estimates and risk-averse choices (Lerner et al.2003). The second hypothesis -risky decision making- suggests that people are loss-averse they dislike losses much more than they like equivalent valued gains (Kahneman and Tversky, 1979). By using a weak form of an identifiable victim effect we provide evidence that suggests that "people see saving a statistical life as a gain, but saving an identified victim was seen as avoiding a loss. Then this predicts that people put greater value on identified victims than on statistical ones"(Small &Loewenstein,2003). These results provide suggestive evidence of the violence of the Drug War on the psychological well-being of the Mexican population.

## **BIOGRAPHICAL SKETCH**

The author of this dissertation, Fernando Plascencia, is a Ph.D. candidate in Regional Science in the Department of City and Regional Planning. He is also affiliated with Social Dynamics Laboratory at Cornell University. He will earn the Ph.D. focus on two research areas Behavioral Economics and Social Networks. Prior to coming to Cornell, Fernando Plascencia received his Masters degree in Economics from the University of Guadalajara in 2006, and his bachelors degree in Finance from the University of Guadalajara, Mexico in 2001.

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Five years ago, I arrived at Cornell and started my doctoral studies as an ambitious scholar with almost no knowledge of behavioral economics and social networks. Cornell is a huge interdisciplinary academic community and I am extremely fortunate that my committee members gave me a tremendous freedom to explore my academic interests in many topics and fields: from regional science and economics to computer science, mathematics and social networks. I am fortunate to have conversations and discussions with many Cornell professors who were not on my committee. I would especially like to thank professors Ted O'Donoghue from the Department of Economics, Behavioral Economics Workshops, Steve Strogatz from Mathematics Department, and Jon Kleinberg from the Department of Computer Science for who offered me many useful comments for other research papers that I worked on during my courses. I have presented my research at numerous seminars and conferences, however, this could not be possible without the financial support from Cornell University. During these five years, I had the privilege to meet outstanding people from different departments, countries, and ideas. I am fortunate to have their friendship which allows me to improve my life and enjoy this academic experience. I owe special thanks to my family and friends for all their support. I think that a Ph.D. is in some way a mirror of human behavior which flows from three main sources: desire, emotion, and knowledge<sup>1</sup>. Thanks Cornell for this experience.

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<sup>1</sup>Plato

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## CHAPTER 1

### STATED PREFERENCES AND WELL-BEING IN RISKY ENVIRONMENTS

#### 1.1 Well-being and Choice: An Introduction

Positive theories of decision making are included in policy analysis to frame questions concerning welfare. Currently, well-being research lays out a number of proposals that would encompass non-standard models of choice, Bernheim, (2008) and these works consider an implicit or explicit definition of welfare. Some approaches assume that well-being flows from the achievement of defined objectives and these objectives guide choices. Other approaches consider that well-being is directly measurable [Berheim, Rangel (2007)]. Though the notion of well-being is intuitively appealing, the two existing approaches revealed well-being and measured well-being encounter serious conceptual difficulties. In the case of revealed well-being, Berheim et al. (2007)'s standard normative analysis evaluates the decision maker of well-being according to her true objectives, that is what her choices reveal; also analyzed in Sen [1973] and in Koszegi and Rabin [2008].

The central problem is that most of the approaches that study well-being are based on conventional rationalization and in order to capture revealed aspects of well-being; researchers should open the door to unconventional rationalizations. In this case, the literature examines two distinct strategies for rationalizing non-standard choice patterns: one strategy, broadens the preference domain while

maintaining the assumption that choice always maximizes a single coherent objective function, the second strategy relaxes the latter assumption, either by adopting a model that accounts for divergences between preference and behavior, or by supposing that the individual pursues multiple conflicting objectives. For example, if we consider well-being choice as a consumption behavior; the research of Beshears, Choi, Laibson, and Madrian (2006) identify factors that increase the likelihood between revealed preferences and normative preferences: they considered “passive choice, complexity, limited personal experience, third-party marketing, and intertemporal choice. Their work discusses six approaches that contribute to the identification of normative preferences: structural estimation, active decisions, asymptotic choice, aggregated revealed preferences, reported preferences and informed preferences. Each of this approaches relies on a consumer behavior approach to infer some property of normative preferences without equating revealed and normative preference and it illustrates these issues with evidence from savings and investment outcomes”.

Other proposals measure well-being directly, as urged by Kahneman, D., Wakker, P.P., & Sarin. (1997), Kahneman (1999), Frey and Stutzer (2002), Kahneman and Sugden (2005), Layard (2005a, 2005b), and Koszegi and Rabin (2008). In this approach, well-being analysis might build upon a sizable body of work in psychology concerning the measurement of happiness and life satisfaction. Happiness research has already achieved a toe-hold in economics; see, e.g. Frey and Stutzer (2000,2004), Kimball and Willis (2006). However, much of the literature considers

the concepts of “well-being, and “self-reported happiness” as if they were equivalent. For example, in Bernheim (2008) a choice-based approach to welfare analysis can simplify the identification problem by equating well-being with a choice well-being. Likewise, one could simply equate well-being with self-reported happiness; Bernheim et al. (2007) stated that an alternative interpretation of standard welfare economics holds that well-being is defined in terms of choice rather than underlying objectives. This perspective has a long intellectual tradition; see Little (1949).

Continuing with Bernheim (2008), “choice” is more due to two types of justifications: instrumental and non-instrumental. Instrumental justifications provide reasons to expect that a choice public policy will improve people’s well-being. One version holds that while choice might be an imperfect proxy for well-being, no better proxy is available. While instrumental justifications portray choice as deriving its normative significance from its connection to well-being, non-instrumental justifications maintain that choices are normatively compelling simply because they are choices; hence it is possible to define well-being in terms of choice without implicitly invoking other objectives.

If we focus on the decision-making process, cognitive science focuses on one of the oldest subject areas of scientific reflection, human thinking itself. Empirical studies of happiness and life satisfaction have spread into a wide range of disciplines including computational social science and applied mathematics. In prac-

tice, economists rely on revealed preference indirectly, evaluating policy options by how they affect economic indicators. Benjamin-Heffetz-Kimball-ReesJones (2012) state that economists increasingly use survey-based measures of subjective well-being (SWB) as empirical proxies for utility. In many applications, SWB data are used to test or estimate preference models, or conduct welfare evaluations in situations where it is difficult to test and estimate credibly with choice-based revealed preference methods. The research of Benjamin-Heffetz-Kimball-Szembrot (2014) proposed an experimental methodology for estimating well-being's relative marginal utilities which are the base to estimate a well-being index. They developed a theory in which utility depends on "fundamental aspects" of well-being measurable with surveys.<sup>1</sup>

The main discussion to determine a well-being index from the perspective of Regional Science is the argument that pre-existing characteristic of the location plays an important role in determining people's well-being. Aslam-Corrado (2011) showed that the different geographical locations where individuals live are considered drivers of well-being and these spatial drivers differ within and between places. Not only are individual-level effects significant, but also these spatial factors influence individuals. There are several spatial factors that we might expect have an impact on people's well-being choices. To narrow these aspects, this re-

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<sup>1</sup>They use SWB abbreviation to indicate aspects modeled after SWB measures used in large-scale surveys, including the Euro-Barometer Survey; the European Social Survey; the German Socioeconomic Panel; the Japanese Life in Nation survey; the U.S.-based Gallup-Healthways Well-Being Index, General Social Survey, Health and Retirement Study, National Survey of Families and Households, and Survey of Consumers; and the World Values Survey

search will consider locations with high-crime and lower crime rates. The following section will review some fundamental work that analyzes choices and risk preferences in violent scenarios.

### **1.1.1 Violence, Well-Being and Risk Perception**

There are few studies in the literature that test choices in violent scenarios. Most of the analyses have focused on the economic or social consequences. For example, Hoeffler-Reynal (2003) examined the economic and human cost of civil war during 1960-1999. Using a global data set they found that a civil war of five years reduces the average annual growth rate by more than two percent. Their survey of the human costs of conflict showed that even long after the war stops the mortality rate increase mainly due to the destruction of public health infrastructure and population displacements. Zussman-Zussman (2006) evaluated the effect of contra-terrorism policies by conducting an indirect test to evaluate the effectiveness of Israel's assassinations policy. Their approach was built on the fact that terrorism has had a significant adverse macroeconomic effect on Israel's economy. Abadie-Gardeazabal (2003) investigated the economic effects of conflict in the Basque Country as a case study. Their main conclusions are that after the outbreak of terrorism in the late 1960's, the per capita GDP in the Basque Country declined about 10 percentage points relative to a synthetic control region without terrorism. Besley-Mueller (2012) exploited data on the pattern of violence across regions and over time by estimating the impact of the peace process in Northern

Ireland on house prices.

On the other hand, Akresh-Walque (2008) examined the impact of Rwanda's 1994 genocide on children schooling. The authors combined two cross-sectional households' surveys collected before and after the genocide. The authors used an identification strategy on which pre-war data was used to control for an age group's baseline schooling to exploits variation across provinces in the intensity of killings and on which children's cohorts were school-aged when exposed to the war. Their findings showed a strong negative impact of the genocide on schooling, with exposed children completing one-half year less education. Beber-Blattman (2010) investigated child soldiering, they followed a field study method interviewing former members of Uganda's Lord's Resistance Army. The theories they used can be captured by a principal-agent model that incorporates punishments, indoctrination, and age-varying productivity. They found that children are more easily indoctrinated and disoriented than adults, but are less effective guerrillas; hence the optimal targets of coercion were young adolescents. Rockmore (2011), studied the effects in general welfare due to violence in Northern Uganda. This work is the first estimate of the economic cost of risk violence separate from the actual experience of violence and finds that there is a significant mechanism by which conflict influences development.

Furthermore, the major contribution to the literature of choice and risk perception has been made by Slovic et al (1984,1980). Their work indicated that subjek-

tive judgments, made by experts are a major component in any risk assessment. If such judgments are faulty, efforts at public and environmental protection are likely to be misdirected. In their paper about perceiving fear, they made an analysis of biases exhibited by lay people and experts when they make judgments about risk. Their work analyzed similarities and differences between lay and expert evaluations in the context of a specific set of activities and technologies. On the other hand, Lerner et al. (2003) studied the effects of fear and anger on perceived risk of terrorism by setting an experimental design on which they predicted opposite effects for anger and fear on risk judgments and policy preferences. This research aims to identify well-being preferences in geographical areas affected by Drug War violence in Mexico; the following section provides a background of this war.

### **1.1.2 Drug War in Mexico: Background**

The Mexican government has addressed the Drug War with all of its military force. Beithel (2013) stated that “Mexico’s drug trafficking-related violence has been punctuated by more than 1,300 beheadings, public hanging of corpses, killing of innocent bystanders, narcobloqueos<sup>2</sup>, narcomantas<sup>3</sup>, car bombs, torture, and assassinations of journalists and government officials involved in crime. In March

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<sup>2</sup>Block Trafficking by gangs members in strategic points of a city to avoid police authorities or military to accede to a violent event. Usually by kidnapping public transportation or private cars which are taken randomly and turn them on fire

<sup>3</sup>A message left by a drug cartel on a cloth banner, usually containing threats or explanations of criminal activity

2012, the head of the U.S. Northern Command, General Charles Jacoby, testified to the Senate Armed Services Committee that Mexico at that time had succeeded in capturing or killing 22 out of 37 of the Mexican government's most wanted drug traffickers. General Jacoby noted that their removal had not had any positive effect in reducing the violence, which continued to climb in 2011. Beithel (2013) stated that with the end of President Calderon's term in 2012, several observers maintained that between 47,000 to 65,000 organized crime-related killings had occurred during his tenure, roughly 10,000 murders a year. The Trans-Border Institute (TBI) at the University of San Diego reported that 120,000 to 125,000 people were killed (all homicides) during Calderon's administration. Addressing the question as to whether violence had leveled off or declined in 2012, TBI estimated that total homicides in Mexico fell in 2012 by 8.5%.<sup>4</sup>

The aim of this paper is to implement an experimental survey that will be the base to develop an index which will be used to analyze well-being preferences in risk environments. This experimental survey is based on a modified version borrow from Benjamin et. al (2014). We might expect several drivers through which drug war violence might affect people's well-being preferences. De Choudhury et al (2014) found that emotional responses in social media might indicate desensitization to violence experienced in communities embroiled in an armed conflict. This diminishing sensitivity might suggest that people living in high-risk environments might act in a less risk averse way as they are not as concerned about

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<sup>4</sup>CRS Report for Congress. Prepared for Members and Committees of Congress Mexico's Drug Trafficking Organizations: Source and Scope of the Violence. June S. Beittel(2013)

risks that seem small relative to their general setting (Quiggin, 2003). However, the Mexican population explicitly exposed to drug war violence might perceive the environment as riskier and might behave risk averse when they make a pair-wise comparison to other choices. The proposed methodology on this research is based on the preference-based theory based on an application of conjoint analysis (Green and Rao (1971)). In particular, we will use a revealed preference approach based on personal and policy hypothetical scenarios- to elicit such set of preferences. The adopted method could be a potential mechanism that public institutions could include in the process of policy making. In addition, there are two methodological points to take care when making this index: first, while the idea is to relate choice behavior to SWB measures, these measures are based on reports on general levels of SWB, whereas the survey questions elicit preferences and predictions comparing the SWB consequences of specific choices. Second, the data collected in research are based on choices framed in hypothetical scenarios. This is a limitation because the two might not be the same. However, using hypothetical scenarios it will allow addressing a much wider variety of relevant real-world choice situations [Benjamin et al. (2012, 2014)].

The temporality of this study will allow both to capture a ranking of preferences and to test the hypothesis that state that residential characteristics (e.g. levels of violence ) affect behavioral well-being responses to the conflict. However, the geographical variation in violence might be endogenous to some unobservable factors that are correlated with the behavioral responses, then both violence exposure and

choices would be biased. Our study aims to contribute to the literature by identifying a set of well-being preferences of a population in violent and non-violent locations exposed to a plausibly exogenous change in the violence environment. The following section will discuss the methodology to develop this well-being index.

## 1.2 Theoretical Framework

The prototype survey stated by Benjamin, et al. (2014) will be the base to guide the objective of this paper. We will follow the theoretical assumptions of Benjamin et al. (2014, p.6) based on a consumption context on which an agent's well-being is represented by a continuously differentiable utility function  $u(c)$ . [ "The vector  $c = (c_1, \dots, c_M)'$  represents the quantities of  $M$  markets goods. Following a change in the consumption vector,  $\Delta c$ , the change can be approximated up to an arbitrary multiplicative scale as:

$$\Delta u \approx (D_c u(c))' \cdot \Delta c = \sum_{m=1}^M \frac{\partial u(c)}{\partial c_m} \Delta c_m \propto \sum_{m=1}^M p_m \Delta c_m \quad (1.2.0.1)$$

The proportionality follows because at the optimum as long as the consumer chooses positive amount of each good  $c_m$  each marginal utility  $\frac{\partial u(c)}{\partial c_m}$  is equal to Lagrange multipliers times the market price  $p_m$ . By fixing prices  $\bar{p}_1, \dots, \bar{p}_m$  at their levels in some base period and measuring the agents consumption vector over

time, the government can track a quantity index of real consumption  $\sum_{m=1}^M p_m \Delta c_m$ . For small changes in  $c$ , the changes in this index are approximately proportional in utility. In addition, a change in utility resulting from a change in the fundamental aspects of well-being, represented by a vector  $w$ , can be approximated as:

$$\Delta u \approx (D_w u(w))' \cdot \Delta w = \sum_{j=1}^M \frac{\partial u(w)}{\partial w_j} \Delta w_j \quad (1.2.0.2)$$

Instead of tracking the agent's consumption vector  $c$ , the government would measure fundamental-aspects vector  $w$ ; and instead of tracking a quantity index for standard consumption, the government would track  $\sum_{j=1}^M \frac{\partial u(w)}{\partial w_j} w_j$  with marginal utilities fixed at the base period.”<sup>5</sup> There are not observable prices that can be used in place of marginal utilities. The unresolved theoretical issue is the aggregation across individuals and is not specific to the approach proposed. Incurring for a nation representative agent assumes that a national well-being index could be constructed from marginal utility estimates, together with an average response to SWB levels.

This experimental survey will be an approximation to construct a well-being index in Mexico. There are few differences between the version used in Benjamin et al. (2014) and the adapted version in this paper. First, in traditional SWB measures a utility would be modeled as a function of market goods as well as non-market goods such as leisure, social relationships and compromised with the commu-

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<sup>5</sup>Since the marginal utilities are defined only up to an arbitrary multiplicative constant this is the index proposed by Benjamin et al. (2014)

nity, crime awareness, violence exposure, which is included in the present survey. In addition, there is a combination of both types of goods since people also made decisions about private and public goods. Second, the survey in Benjamin et al. (2014) uses an important wide list of fundamental aspects of well-being. Since there are aspects of well-being that resemble each other, the present survey worked behind the idea of overlap-detection by using a variation on the original SP survey by reducing (1) the number of hypothetical scenarios from 30 to 15, and (2) by considering that the combinatorial and fundamental aspects of well-being must appear balanced on each scenario, bundles of 6 and 8 aspects allow respondents to pairwise comparisons. The present survey considers aspects that can be combined by incorporating hypothetical personal and policy aspects in a single scenario. This makes easy to compare if the relative marginal utility of the joint aspects has an effect on preferences. Furthermore, if we assume that a utility  $u(w)$  depends on a vector  $w$  of aspects of well-being, any vector proportional to the vector of marginal utilities  $D_w u(w)$  can then be used as relative weights for combining the components of  $w$  into an individual-level index that tracks small changes in well-being. For large changes in the aspects, the index can be used to track these changes.

The version of the survey on this research used hypothetical scenarios, 3 personal choice scenarios, 3 policy vote scenarios and 9 combined hypothetical scenarios. This experimental framework resembles the analysis reported in Rao (1971) Tversky and Griffin (2000). The current phenomena of violence and corruption related

to drug violence in Mexico make the scenarios relevant to the Mexican population. In addition, the survey is directed to respondents residents in violent and nonviolent cities which put respondents in a situation to valued well-being aspects from different spatial characteristics. The prototype online survey will estimate a vector proportional to the vector of marginal utilities  $D_w u_w$ . In each scenario, it is possible to elicit respondent's preferences between two options that differ only on how they compare a small set of aspects. This framework anchored on preference-based theory will help to fill the gap in understanding people's judgments about well-being in risky environments: People will reveal their preference-based on hypothetical choices, according to with the following hypotheses:

**Hypothesis 1.** *Residents in violent places might rank well-being's emotional & affective aspects higher than people who reside in nonviolent places.*

**Hypothesis 2.** *Residents in nonviolent places might rank well-being's risk perception and personal safety aspects higher than people who reside in violent places.*

The following sections will discuss the experimental survey design and the well-being aspect index method to test these hypotheses.

### **1.3 Experimental measure of well-being aspects**

The Benjamin et al. (2014)'s experimental survey requires that the list of aspects as an argument of utility must be exhaustive and non-overlapping. The list of candi-

dates of fundamental aspects is based on (1) common well-being questions asked in large-scale surveys and (2) a mainstream of well-being studies. The present research made a modification to the former list by using 120 private aspects and 30 public aspects socioeconomic reality in Mexico. From a structural-functional view the items of the survey might be grouped in families of questions which can cover up to 12 general themes: 1 Happiness and life satisfaction, 2 Negative emotions, 3 Social network support, 4 Social engagement, 5 Health, 6 Freedom and personal autonomy, 7 Personal and progress inter-generational, 9 Corruption and state of law, 10 Security, 11 Drug War and 12 Government. ( See Appendix )

## **1.4 Survey Design**

### **1.4.1 Scenario Screens**

We modified the experimental survey considering 15 hypothetical choice scenarios, one per screen and they are preceding by demographic questions and screen of instructions. The scenarios consider possible fundamental and combinatorial aspects of well-being. We have five different lists of well-being aspects, to simplify we name an “x-list” for those aspects that include 115-you private aspects, a named “X-list” contains 5-only you private aspects, a “y list” contains 115-other’s private aspects, a “Z-list contain 30-public aspects and a “z list” contains 115-people’s private aspects. Each scenario has either 6 or 8 aspects and they were

selected randomly by the computer. The algorithm optimizes the selection of aspects to avoid repetition in each scenario ( see Appendix ). An example of a personal and policy scenario is reproduced below. Likewise in Benjamin et al. (2014, p13), each screen has three components. First, the *preamble* frames the scenario as a choice between two options that are neutrally labeled “Option 1” and “Option 2” which describes the weight in the impact between the two options. The second component is the *aspect table* that describe the consequences of the two options. by marking them with an “X”. Finally, the third and final component is the *choice question* which elicits the respondent’s stated preference between the two options.

The Figure A.1 in the appendix shows an example for personal choice and policy vote. In the estimation procedures, the dependent variable is the response to the choice question, and the independent variables are the relative ratings of the aspects (“X’s). Because the survey randomly assigns the weight of each aspect between the options, is possible to identify the relative marginal utility. The computer assigns the rating aspects “X’s” balance between the two options.

*Preamble:* In general, there are 15 versions. The first version introduces *personal-choice* scenarios. Here the opening clause “Imagine that you are making a personal decision between two options” will focus on private-good aspects on which a personal choice seems to be the relevant setting for eliciting these aspects that are weighted randomly by the computer and respondents analyze the impact on their well-being. This preamble uses a list of 115 “private goods”-relating to an individual’s own well-being and use the words treatment *you* and *you only* . The

difference between these two words are as follows: you (e.g your health) could in principle pertain to everyone, however, *you only* pertains to the respondent and could not pertain to everyone.

The second preamble version introduces policy-vote scenarios: the opening clause “Imagine that you and everyone else in Mexico are voting on a public policy. Policy-vote scenarios will be related to public policy in Mexico (drug war, inequality, insecurity, corruption, and freedom of speech) and have two purposes. This preamble uses 30 public aspects and 120 well-being own to others/people aspects. This preamble uses the word treatment *people/nation/society* and when it refers to a country it refers to Mexico. Since this preamble considers public goods, it has been proposed 30 public aspects that cannot typically be affected by one individual’s personal choice. If a national SWB survey is to be used for evaluating policy, it may be useful to elicit the relative weights in a setup where the aspects pertain to everyone.

*Aspect Table-* Personal scenarios will draw aspects randomly from a set of 120 private aspects (which consists of 115-you, 5 -only you-aspects). The policy scenarios proposed will draw aspects randomly from a set of 115 everyone- and 30 public-aspects; these 145 aspects are effectively public goods because they affect everyone in the same way. Following the strategy of Benjamin et. al. (2014,2012), and reducing the number of private and public aspects of each scenario this experiment will randomly draw aspects making groups of 6,8 aspects. The rating of each as-

pect is randomly assigned from a seven rating scale. The choice response scale is identical across all scenarios and it is designed to elicit the intensity of preference on a six-point scale.

*Choice Question* The choice response scale is identical across all scenarios and it is designed to capture the preferences on a six-point scale (“Much Prefer Option 1”, “Somewhat Prefer Option 1”, “Slightly Prefer Option 1”, “Slightly Prefer Option 2”) and it is omitted an “indifferent” choice option. The the rest of combinatorial scenarios use the same frame to elicit preferences.

## **1.4.2 Recruitment Method**

The recruitment in traditional behavioral experiments is typically conducted by using Amazon Turk. This paper focuses on the Mexican Population on which there is a limited existence of Amazon Turk users. One promising method for recruitment is the use of on-line advertisements(ads). On-line ads compare with traditional recruitment strategies are currently selected methods in terms of financial cost [Williams, Proetto, Casiano,&Frankling,2012], and a number of labor hours required [Battistella, Kalyan,&Prior,2010]. Facebook ads as a recruitment method have a low per-participant cost allowing to target ads to users profile most likely to be interested in a specific area. Some research has used Facebook advertisements as one of a variety of recruitment strategies with successful results see [Arcia(2014),Ahmed, Jacob, Allen & Benowitz (2011), Batisella et al., (2010),

Jones & Magee (2011), Richiardi, Pivetta, & Merletti (2012); Ryan & Xenos (2011), Williams et. al (2012)]

Inclusion in this study was limited to the Mexican population aged 18 to 60 years old that have access to the Internet and have a Facebook account. Facebook was used for several reasons: First, the Digital Market Outlook showed that in 2015 the number of Facebook users in Mexico was 41.26 million. In 2018, the number of Facebook users is expected to reach 54.16 million. Second, social media have emerged as prominent information sharing ecosystems in the context of a variety of crisis, the response in social media and how they might indicate desensitization or sensibility to violence experienced have been and increased interest in HCI (Human Computing Interaction) research [see Choudhury, Monroy-Hernandez, Mark(2014)]. For these reasons, Facebook was selected to implement the recruitment. The sample collected auxiliary demographic variables -gender, marital status, education level, age, household size, income level, state, and municipality-. The recruitment was made by using Facebook's self-service application to create 4 ads, each accompanied by a different image but with identical copy: Do you live in Mexico? Participate in this survey and win dollars in this study. Clicking on the ad led users to the study survey welcome page on which it is explained that if they decided to participate they will have 1-20 chance of winning a \$10 dollars in Amazon gift cards. The page explained that all information provided is anonymous and if they consent to participate they log in by using their Facebook account. Not recording of personal information was made. Facebook Ads include

a map of Mexico, a Cornell University Logo and a text "Survey Social Networks and Subjective Well-Being" (See Supplementary Figure 1 attached in Appendix). The Ads were adhering to Facebook guidelines and they were target such that they appear on desktop devices and it appeared on the Facebook desktop news feed and on desktop right column randomly.

The designated market area was violent and nonviolent Mexican cities selected based on the Mexico Peace Index 2015 calculated by the Institute for Economics & Peace (this index is based on 7 key aspects: homicides, violent crime, weapons crime, incarceration, police funding, organized crime and justice efficiency). The scale of the index allows to classify cities with high rate of criminality of the city lies between 2.63 and 3.66 and low-rate of criminality if the city has below 2.63 pts. The Ads were shown on Facebook pages of Mexicans users aged 18 to 60 years old that stated the resident in Mexico. The optimization and delivery method selected was the cost-per-click (CPC) payment method. This option allows a buyer to pay only when users click on the ads whereas in the cost-per-thousand-impressions model cost is based on the number of times (in thousands) that the ad appears on user's screen. The Facebook Ads in the CPC model entering in an auction where the buyer can choose a bid on what link clicks are worth for the buyer; in this case, the model selected was an automatic bid where Facebook set automatically the bid to get most clicks at the lowest price. The delivery method selected was a standard approach which it means that the ads were shown throughout the day. Cornell University, Institutional Review Board for Human Participants

approved the procedure (Protocol ID#: 1511005970). The study was coded using NubiS which is a complete data collection tool that has been developed by the team behind the Understanding America Study (UAS) panel at the Center for Economic and Social Research at the University of Southern California and it was hosted by the same research center. This experimental survey was coded in English and Spanish language. We used the Spanish version, the set of well-being aspects considered and the scenarios screens are included in the Appendix.

## 1.5 Prototype Model: Personal and Policy Benchmark specifications

Following Benjamin et al. (2014), to capture stated preferences, the following model was implemented:

$$StatedPreference_s = \alpha + AspectRatings\beta_s + \epsilon_s \quad (1.5.0.1)$$

Each observation  $s$  captures the information from the scenario  $s$  faced by the respondents, corresponding to the prospected survey screens like in the example,  $StatedPreference_s$  will encode the response to the choice question, while  $AspectRatings$  will encode the differences between the two options. The same

model will be used to analyze the results for personal, policy vote and the rest of combinatorial scenarios. This experimental design uses six points on the choice scale assigning six numerical values  $(-3, -2, -1, 1, 2, 3)$ , and the seven columns in the aspect table that have the values  $(-3, -2, -1, 0, 1, 2, 3)$ . The econometric specification was made by coding the verbal scale of the independent and dependent variable as exogenous imposed numerical scales. To obtain the values for the choice scale we used the standard normal CDF to calculate the expected value of latent preference intensity conditional on observed intensity category; linearly scale this conditional expectations to be on  $(-1,+1)$  interval, symmetrize them around zero by taking the average of the absolute value of each corresponding conditional expectations.

## **1.6 Empirical Results: Personal and Policy Choices Marginal Utilities Estimates**

The Facebook Ads ran from January 11 to June 10, 2016. According to data provided by the Facebook self-service ad management application, the ads were shown a total of 2,455,893 times to 848,598 Facebook users over the 33-weeks campaign with a mean of 2.89 impressions per unique user. The ads received 7,828 clicks by 6,490 unique users for a total click-through rate of 0.32% at a mean cost of \$0.08 per click. The success of the ads is measured by clicks and click-through rate which varied substantially depending on the ad image. The total

cost of the Facebook ads was \$578.44. The participants mean age is 25-29 years. Only participants who reached the end of the survey were considered for analysis and the demographic characteristic is summarized in Table 1. All participants reported their State and County of residence. The sample considered is (N= 259) internet completed survey respondents which are demographic diverse -albeit no representative- sample of the Mexican adult population

### **1.6.1 Personal Choices: Discussion**

The estimation of personal choice scenarios show that personal growth and happiness measures- "Your ability to dream and pursued your dreams", "Your ability to be yourself and express yourself", "Your having a role to play in society", "Your success at accomplish your goals", "You are having more options and possibilities in your life and the freedom to choose among them", "Your ability to fully experience the entire range of healthy human emotions", "Your feeling that you have enough time and money for the things that are most important for you", " -are the highest ranking aspects more than the affective and evaluative SWB ones- "How much time you feel happy"[70] or "How happy you feel"[83] and positive affect measures "How often you smile or laugh"[38]. The main results are reported in Table A.2 in Appendix

*Risk, Safety emotions and health:* consist of seven own introspection measures and three aspect classes. Two own measures related to Drug War Violence-

“Your neighborhood is safe (no thieves, extortion, smuggling, kidnapping or murders)”[9], and “Your home is free of addictions”[11] are following by “Your health”[19] and “Your physical safety”[27] -which aspects lies on the top of the table with measures 0.231-0.220 and 0.188-0.165. “Your mental health and emotional stability” lies below this rank [87].

*Negative emotions:* Benjamin et al (2014), Deaton et al (2011) suggest capturing measures negative emotions. The survey captured ten measures which have the following rank; sleep[18], stress[20], anger[31], feeling full of energy [41], anxious[52], frustration[75] and sad [97].

*Social Media and Eudaimonic SWB* By using social media (Facebook, Twitter) we observed people reactions towards different events of corruption and violence in Mexico which suggest using measures to capture people involved in the community. The aspects “Your sense that you are making a difference, actively contributing to the well-being of others”[25] and “Your sense of community, belonging and connection with other people”[67] lie on first and middle on the Table.

### **Personal choices in violent and non-violent locations**

*Happiness and life satisfaction:* Table A.3 on Appendix show preferences of the respondents who live in Non-violent locations. This group ranked evaluative and affective SBW aspects such as “Your sense that you know what to do when you

face choices in your life”, “The happiness of your friends”, “Your ability to pursued your dreams” and “Your health” with coefficients in the range 0.763-0.503. Residents of violent places [N=164] in Table A.4 rank as follows: “You are getting the thins you want out of life”, “ Your sense that everything happens for a reason”, “Your knowledge, skills, and access to information,” and “Your ability to fully experience entire range of healthy human emotions” with coefficients in the range 0.416-0.267.

Preferences related with *Risk, Safety emotions and health* showed that residents of non-violent locations have the following order of preference- “Your health”[4], “Your physical safety and security”[6], “Your home is free of addictions”[9], “Your neighborhood is safe (i.e no thieves, extortion, smuggling, kidnapping or murders)[17], “In your neighborhood there is not presence of drug trafficking organizations”[25], “You feel safe in your neighborhood”[70], and “Your neighborhood is free of drug war violence”[83].

With respect to the residents of violent location, Table A.4 shows the rank in the following order: “Your neighborhood is safe (i.e no thieves, extortion, smuggling, kidnapping or murders)[19], “Your health”[55], “Your home is free of addictions”[64], “Your physical safety and security”[92], “You feel safe in your neighborhood”[94], “Your neighborhood is free of drug war violence”[95], “In your neighborhood there is not presence of drug trafficking organizations”[118]. It is important to notice that the rank of negative emotions show slight differ-

ences between non-violent and violent locations with the following rough order of preference, listed as [non-violent]-[violent]: sleep[5]-sleep[48], stress[18]-stress[12], anger[23]-anger[40], worry[31]-worry[114], energy[37]-energy[81], depressed[73]-depressed[101], sad[74]-sad[87], fear[100]-fear[93], pain[101]-pain[104].

In summary, this stated-preference-based approach yields high marginal utilities estimates on measures related to - the quality of life, well-being of family- and with aspects related with risk and safety emotions such as “physical safe”, “security”, “home free of addictions”, “neighborhood safe”, or “neighborhood free of drug violence”. These measures have not previously been asked in large-scale surveys. The results -albeit not representative of the Mexican population- allow distinguishing preferences of residents in violent and non-violent locations.

## **1.6.2 Policy Choices: Discussion**

Policy scenarios are reported in Table A.2 of Appendix and use hypothetical specifications related with public aspects. In such scenarios, respondents vote on policy trading off 115 everyone aspects (personal aspects that pertain to everyone) and 30 public aspects (public goods that pertain to socioeconomic and political issues in Mexico). There are three policy scenarios that each respondent faced. The comparison between the two panels is possible due to the use of same numerical scales as in the personal scenario case. The survey collected fewer data in these policy

scenarios, the errors standard are larger and the correlation between the 115-*you* and 115-*everyone* coefficient pairs is low. However, the results may reflect respondents greater uncertainty towards other. If the set of public a policy scenarios were highly correlated it might be interpreted as a confusion to distinguished between scenarios that affect the respondents and aspects that affect the society on general. We observed that respondents state preferences with high intensity in policy scenarios. The high rank 30 *public aspects* include: “Freedom of Conscience and belief in Mexico”[1], “The amount of order and stability in Society”[16], “Equal Opportunity in Mexico”[18], “Low rate of unemployment in Mexico”[28], “The average income of people in Mexico”[35], “The low the rate of criminality in your town ( i.e no thieves, extortion, smuggling, kidnapping or murders)”[37]. “The well-being of people in Mexico”[39], “The low rate of addictions at home in Mexico”[41]. “The efficiency of the local government of your town to provide basic public services”[45], “The general confidence in local institutions in Mexico”[57], “Low rate of drug trafficking in your town”[60].

Policy scenarios-*everyone* aspects related with *Risk,Safety emotions and health* showed a ranking order as follows: “People’s neighborhood is free of drug trafficking”[5] and “In people’s neighborhood there is not presence of drug trafficking organizations”[14], “People feel safe in their neighborhood”[11], “People’s neighborhood is free of drug violence ( i.e murders by drug gangs, shootings, narcobloqueos, public hanging of corpses, beheadings)”[34], “People physical safety”[65]. Negative emotions are ranked on the following order of preference, frustration[2], anger[10], stress[58], pain[61], fear[77], sad[107].

## Policy choices in violent and non-violent locations

The corresponding 30 *public aspects* stated preferences for violent and non-violent locations are reported in Tables A.3 and A.4 on appendix, these include “Freedom of Conscience and belief in Mexico [1;20]”, “People’s neighborhood is free of drug trafficking [2;13]”, “People’s neighborhood is free of drug violence ( i.e murders by drug gangs, shootings, narcobloqueos, public hanging of corpses, beheadings) [42;56]”, “Low rate of unemployment in Mexico [56;25]”.

Policy scenarios-*everyone* aspects related with *Risk, Safety emotions, and health* showed a ranking order as follows: “People feel safe in their neighborhood”[17,90], “People mental health and emotional stability [9,127], “Peoples’ health [138,7]” By comparing the overall results of personal and policy scenarios we can reject our hypotheses. There is a set of preferences on policy aspects related to security and drug violence. We suggest to interpreting this set of aspects carefully, since, one concern is that the geographical variation in violence might be endogenous to some unobservable factors that are correlated with the behavioral responses, in addition to reference group size of analysis ( violent and non-violent locations) might influence an affect the identifiability. However, the results provide new findings on well-being analysis, in his case affective responses indicate has not yet reach desensitization to violence experienced in communities embroiled in an armed conflict.

## 1.7 Conclusions

This paper follows a methodology to track well-being preferences as means to develop an SWB index. However, there is still an unsolved theoretical issue related to utility aggregation across individuals. In theory, to have a representative agent a national well-being index could be constructed from marginal-utility estimates together with average responses to an SWB survey. However, if we aggregate SWB responses that were regularly used for policymakers, both governments and individuals might have an incentive to manipulate a survey-based index for their own benefit. The size of the survey captured is not representative of the national population however it provides a set of well-being aspects preferred by residents of places with high and low rate violence affected by the drug war. The literature states that among the consequences of a war, the impact of the mental health of the civilian population is one of the most significant [Srinivasa Murthy and Rashmi Lakshminarayana(2006)]. Participants in this experimental survey are mainly women (see Table A.1), which are the group more vulnerable to the psychological consequences of war (the association between gender-based and common mental disorder is known). Studies have shown that physical and psychological support minimize the effects of war-related traumas as well the role of religion and cultural practices. The main findings of this experimental survey reject the claim that negative affect aspects dominate the rank of non-violent scenarios, risk, security and health aspects domain the rank of violent places. In contrast with, social media reactions to violence, De Choudhury et al (2014) found that

emotional responses in social media might indicate desensitization to violence experienced in communities embroiled in an armed conflict. Some aspects are known to be psychologically correlated with desensitization. One main technical concern of this finding corresponds that we are considering a geographical variation in the levels of violence to examine behavioral responses. If this geographical variation is endogenous to omitted factors, we are only trusting on behavioral responses systematically related with pairwise well-being scenarios and violent exposure. We explored the relationship between individual's well-being preferences at the level of violence to which they are exposed.

On the other hand, a theoretical concern is related to violence and its effects on mental health, "someone experiences or witnesses an act of violence does not mean that he or she "will inevitably develop psychiatric morbidity", Curran PS, Miller PW(2001). After September 11, 2001, attacks in New York City, it was noted that "in the aftermath of terrorist attacks, many Americans...regarded their distress as a normal reaction rather than "a disorder needing [psychiatric] care, Drus BG, Marcus SC (2001). Leva (2006), stated that "what the currently available evidence seems to suggest is that it takes more than the agent (e.g., a threat to life) to provoke psychopathology. Indeed, the role of the environment is of importance, a component of the epidemiological triangle that has been neglected by a greater focus on host-related factors (e.g., gender or age of the victim)." Future work needs to study and identify sources of emotional support, risk factor analysis related with coverage of basic public policies: a neighborhood free of drug violence, not

to have drug trafficking organizations, policies that improve personal growth, the overall well-being of people and people's family are the most ranked. Third, the effects of war on individuals and communities highlight some psychopathological effects, some researchers focus either on human suffering or on community factors that enable to withstanding the stressful event; this bridge between this two approaches have yet to be bridged.

There are two main lines of research when studying well-being indices, the most important theoretical issue is aggregation across individuals. To assume a representative agent, a national well-being index could be constructed from marginal-utility estimates. Aggregate SWB responses, such as stated in Benjamin et al. (2014) might be used by policymakers to manipulate the survey index since policymakers they have the incentive to manipulate the survey-based index for their benefit (e.g. by selecting questions, weights, and respondent population). The experimental survey of the present paper reduces these incentives. On the other hand, rewarding the theoretical problem of aggregation, if we assume that every individual's marginal utility is connected in a network structure [ie. cities, counties, states], one possibility is the use of fuzzy sets for handling various forms of uncertainty. In decision-making, is related to the design and control of complex systems. The problem of fuzzy community detection in networks complements the idea of overlapping groups. By using fuzzy theory and optimization methods, an alternative way to solve the problem of aggregation across individuals is to approximate a network feature matrix for a conventional fuzzy community de-

tection based on marginal utility estimates. If this possibility works, we can start to use a market-price index to such aspects.

Finally, this paper uses social media to recruit respondents residents from violent and non-violent cities; due to the popularity and penetration of social media, people now use them to report the status of disasters and emergency events. The rich set of social sensing data in study well-being offers us great opportunities to develop some real-time situation awareness tools that can efficiently detect and track the status of well-being aspects in a reliable and timely fashion. Such tools could greatly assist the government to effectively allocate important resources and get useful feedback from common citizens.

## CHAPTER 2

### RISKY ENVIRONMENTS, HAPPINESS AND NETWORKS IN BLAU SPACE

#### 2.1 Introduction

Studies of social network support concern the idea that social ties or social interaction are a factor in determining some characteristic of people's well-being. There is some tendency in the literature to conflate social networks and social support. However, conventional approaches have compounded these problems by relying on unidimensional conceptualizations of a social network in public health issues (Glass, Mendes de Leon, Seeman & Berkman 1997; Seeman 1996). One consequence is that research focus on network structures that explain the relation between social support and health is incomplete (Seeman & Berkman 1988; Wellman 1981).

Kannaiapuni, Thompson, Donato(2000) state that the research on community and social support has paid particular attention to the way that resources are transferred. To address the two-way relationship between social network support and people's well-being, we should draw on studies covering these relations and fit a dimension on which such networks should be analyzed. This paper will focus on homophily differences; Mexican males and females differ in their tendency to associate with certain types of social networks. We focus on the Mexican population for several reasons. First, it is a nation that has been marked by sustained

economic recession, corruption, violence and growing socioeconomic inequality (Bobadilla et al. 1993). Second, the current wave of violence. The Mexican Drug War is an ongoing armed conflict either among rival drug cartels for regional control or against the Mexican government forces and civilian vigilante groups. The Mexican government has addressed the Drug War with all of its military force. Beittel (2013, 2015) stated that “Mexico’s drug trafficking-related violence has been punctuated by more than 1,300 beheadings, public hanging of corpses, killing of innocent bystanders, car bombs, torture, and the assassination of journalists and government officials involved in crime. In March 2012, the head of the U.S. Northern Command, General Charles Jacoby, testified to the Senate Armed Services Committee that Mexico at that time had succeeded in capturing or killing 22 out of 37 of the Mexican government’s most wanted drug traffickers. General Jacoby noted that their removal had not had “any positive effect in reducing the violence, which continued to climb in 2011. Beittel (2013) stated that with the end of President Calderon’s term in 2012, several observers maintained that between 47,000 to 65,000 organized crime-related killings had occurred during his tenure, roughly 10,000 murders a year. The Trans- Border Institute (TBI) at the University of San Diego reported that 120,000 to 125,000 people were killed (all homicides) during Caldern’s administration. Addressing the question as to whether violence had leveled off or declined in 2012, TBI estimated that total homicides in Mexico fell in 2012 by 8.5%.”<sup>1</sup>

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<sup>1</sup>CRS Report for Congress. Prepared for Members and Committees of Congress Mexicos Drug Trafficking Organizations: Source and Scope of the Violence. June S. Beittel(2013)

People living in regions facing warfare or political conflict are often exposed to protracted violence that has negative mental and physical side effects. Prolonged exposure to violence, through media reports, and direct observation can bear detrimental impacts on people's affective and behavioral process [Choudhury, Monroy-Hernandez, Mark (2016), Anderson, Bushman(2002)]. Social media has enabled Mexicans to create alert networks, where traditional media have weakened. While we do not know what people's intrinsic motivation for participation is assumed that strong emotions motivate them to take some risk and use social media to reach collective action [Monroy-Hernandez, Kiciman, Choudhury (2013)].

The current waves of violence in Mexico has driven to citizens to use social media and social network support to respond to crises. We will use data from the Mexican National Institute of Statistics and Geography (INEGI) which in 2012 conducted the first survey of subjective well-being (SWB) and we will use the social support network instrument to conduct our analysis. The survey uses a self-reported well-being measure and it is representative of the general population. We depart from the claim that a close relationship exists between well-being and social network support. Therefore, in this research, we will use SWB individual rates of happiness and life satisfaction to made different matrices of association and explain such differences. The next section will explain these theoretical relations.

## **2.2 Social Networks: Homophily and Well-Being**

In theory, social support networks are linked to improve people's well-being in several ways. They may provide emotional benefits, which include intimacy, a sense of belonging and self-esteem. They may also offer instrumental and material benefits by providing tangible assistance, such as money, services, goods, guidance and advice (Wellman & Wortley 1990; Kaplan, Cassell & Gore 1977; Walker, MacBride & Vachon 1977; Weiss 1969). On the other hand, Durkheim's (1951) research on health, networks, and well-being which work focused on social isolation and suicide. Contemporary studies also suggest that adult social relationships have health-enhancing effects. Social support and social engagement reduce mortality risks and disability (e.g., Kawachi, Colditz, Ascherio, Rimm, Giovannucci, Stampfer, & Willett 1996; Forster & Stoller 1992; Sugisawa, Liang & Liu 1994, Litwin 1998), improve disease recovery rates (Berkman 1995), and promote cognitive development and function (Fratiglioni, Wang, Ericsson, Maytan & Winblad 2000; Berkman 2000). Other studies have also pointed to cultural factors (such as strong ties among Mexican families) that may diminish the deleterious effects of poor socioeconomic status on well-being (Cobas et al. 1996; Collins and Shay 1994; Guendelman et al. 1990; Guendelman & Abrams 1995; Guendelman 1995; Scribner 1996; Scribner & Dwyer 1989; Zambrana et al. 1997).

Although few studies have examined the relationship between well-being and homophily based on network association, some studies state that households that

sustain strong social ties with kin and others manifest higher levels of happiness and life satisfaction. The support occurs both directly, by providing additional “parental support”, sharing the same interest and indirectly, by offering greater access to less-tangible benefits, such as emotional support and intimacy, that derive from ties with same peers or friends that belong to the same network. “Reciprocal exchange refers to a transfer of commodities or services between groups or individuals. Although an exchange often begins between persons with few resources, once it occurs it forms an important resource that may be used whenever needed. Using this type of exchange, households may organize the provision of basic needs by cultivating emotional and economic reciprocity and alliances among friends, neighbors” (Kanaiaupuni et al. (2000). Therefore, social networks are vital to exchange relationships because people use them to build security (Lomnitz 1977).

The social networks and certain features of an institutional culture such as trust in institutions affect the meaning and the possibility of individual and collective action. Social norms such as trust in institutions appear as the factor of formation of social networks along with the capacity to make connections (Lomnitz 1977:134). These two aspects are important for the strengthening of institutions. However, there are aspects that dismiss the participation such as social distrust, or the inequality and increased of social gaps. Burke-Peyton [2011] and Buskens [2002] stated that trust has to do with some positive expectations that an individual has in relation to possible cooperative behavior of another individual within a social

group, behavior that affects the way the first decides the course of action, simply reflects a favorable belief about unobserved actions which requires cooperation be validated by experience. Likewise, stated by Becker [1973] trust will have to do with the credibility of information to draw upon any decision. Trust becomes a social norm when acting cooperatively has been established as a general practice.

Kanaiaupuni et al .(2000) state that social arrangements may help people secure the resources they need, however, limited knowledge exists about how these relationships operate. From studies using data collected in the United States, Mexican families, for example, participate in large kin networks and engage in high rates of visiting and exchanges, patterns reinforced by greater propinquity of relatives compared to non-Hispanic whites (Keefe 1984; Mindel 1980). Some suggest that these networks are more likely to provide emotional support than instrumental or material assistance (Vega 1990:1019; Golding & Burnam 1990). In addition, some authors such as Aslam-Torrado [2011] showed that the different geographical location (for example, urban or rural) matters for individual well-being and whether the drivers of well-being differ within and between these different levels. In terms of homophily differences, we expect to see a heterogeneous path of drivers for individual well-being across regions in Mexico, cultural and geographical might impact the decision of people in getting involved in a particular network.

Overall these findings, in terms of homophily, we expect to provide some evidence that helps to explain the relationship between social networks support

when controlling for two fundamental aspects of well-being such as life satisfaction and happiness. In this paper, we advance the literature on the social network analysis by focusing only on homophily, or the tendency for similar individuals to associate. By stepping back and examining the organization of social relationships and people's levels of happiness and life satisfaction, the present analysis answers some key questions about homophily in social networks that provide certain social support to the Mexican population in the Drug War violent environment. An important theoretical aspect to addressing the two-way relationship between social support and well-being; as mentioned before, is the tendency to associate with each other (Laszarfeld and Merton,1954). There are two types of homophily: structural and choice homophily. Structural homophily accounts for homogeneity in association through social constraint. Individuals are channeled into particular social locations by processes larger than themselves and, as a consequence, are surrounded by those who are similar. Because many individuals only have access to those who are similar to themselves most friendship networks are relatively homogeneous, Blau(1977). Choice homophily accounts for homogeneity in associations through the simpler mechanism of preference. Specifically, choice homophily often claims [McPherson, M.J., Smith-Lovin (1982, 1987)] that those who are dissimilar are more difficult to interact with than those who share common knowledge.

Brashears (2008,2014), state that in addition to the strength of homophily, we must attend to the impact of social distance. Individuals who are relatively unlikely to

come into contact are at great social distances while those who are very likely to come into contact are at short social distances. To examine the differences in the strength of homophily as well as the social distance of the population affected by the violent environment of the Drug War, it is necessary to narrow the dimensions where both of these may vary. De Choudhury et al.(2014) state that a chronic exposure to violence as a consequence of urban warfare in Mexico is associated with lower emotional responses on social media ( e.g Twitter post) of citizens experience the violence. Although there exist network contagion attributes to these phenomena, and these attributes of the individual ( e.g. personality, gender, age socioeconomic status) make some more vulnerable to the wave of violence in Mexico. Likewise, in Brashears (2008), gender was be chosen for various reasons: “first, from a statistical point of view, this helps to avoid the difficulty of power problems that result from comparing groups that are unequally represented. From a theoretical point of view, this helps to avoid the possibility that consolidation may obscure the phenomena of interest”. Second, the wave of violence affect psychologically males and females differently, while there is not research that explains people’s intrinsic motivations for participating in this case, it is assumed that strong emotions motivate them to take some risk and use social network support and social media to reach collective action, [Monroy-Hernandez et al.(2013)]. In Blaus (1977) terminology two dimensions are consolidated to the extent that knowledge of one produces knowledge of another, this dimension (gender) will help to explain such differences.

Third, there are several drivers through which we may expect that different rates of violence affect people's well-being and the way they associated in social network support. We expect that the geographical heterogeneity in a violent environment is correlated with other aspects of the locations (i.e political). If the geographical variation in violent rates is endogenous with some unobserved factors that are correlated with people's intrinsic motivation to associate or people's intrinsic motivation to participate are systematically related to violence, then the results will be biased. This paper narrow the study to analyze only homophily differences. We will examine the following dimensions: geographical area (urban and rural), education (college-high school), marital status (single-married). We expect to find that homophily is stronger for men than women in (urban areas), and similarly homophily for high school. Single women may have stronger homophily in a college level education than married women. And single men have stronger homophily than married men. As kin keepers [(Moore, 1990) (Brashears(2008))], women often have more opportunities to associate with those of different backgrounds than do men and thus should experience less homophily. As education powerfully influences job chances, and males and females remain subject to occupational segregation in a variety of ways (Reskin,1993).

We expect that Mexican females will find themselves in less educationally homogeneous environments and thus be subject to weaker educational homophily. Finally, for marital status, we expect to find that homophily is weak for single men than women, as Feld (1981) notes, many ties are derived from particular foci. As

a result, if women are more involved in kin relations, many of their non-kin associates may derive from settings compatible with an emphasis on kin (e.g., daycare centers, family social gatherings, etc.) rather than settings focused on non-kin (e.g., most workplaces, professional associations, etc.) Social distance represents a more difficult arena in which to make predictions. While distances will certainly be longer in areas where homophily is stronger, and shorter where homophily is weaker, the aim of this paper will not cover the study of differences in the configuration of social distances between males and females.

### **2.3 Hypotheses, Data and Methods**

It is assumed that a respondent's well-being will be affected by participating in a determined social network due to the degree of heterogeneity of ties and resources they provide. Earlier research shows a positive relationship between belong to a network and receiving informal support (Wellman 1992; Wellman & Wortley 1990, Seeman and Berkman1988), because social networks reduce economic or emotional uncertainty, compared to those who are more socially isolated. In addition, there exist homophily and social distance. There is a heterogeneous way to model this idea, however in this paper we will start the analysis, first from general cases of homophily differences of males and females, those who live in urban and rural areas and second, to particular cases such as marital status (single or married), and education (high school or college); and observe the different outcomes

in homophily. In particular to model the effects for males and females, we claim that network participation varies in three ways, likewise in Brashears(2008,2014): uniformity, proportionality, and dissimilarity

**Hypothesis 3.** *Uniformity Hypothesis: Males and Females have an identical pattern of association in participating on social networks.*

**Hypothesis 4.** *Proportionality Hypothesis: Males and Females have an identical pattern of association in participating on social networks but differ in the strength of such patterns.*

**Hypothesis 5.** *Dissimilarity Hypothesis: Males and females differ in the patterning of their associations, in participating on social networks and/or the strength of that pattern.*

To test these hypotheses, we will use data from the Subjective Well-Being survey of the National Institute of Statistics and Geography in Mexico. The sample included respondents between 18 and 70 years old. The housing selection procedure was by a random method in which the birthday of the person selected was closest to the time of acceptance of the survey in the house. 10,654 modules were filled with 66 questions. The present research will use only the network instrument related to social network association. There are 12 categories: 1. Church or religion, 2. Group or association that promote some religious values different than the church, 3. Political party, social movement or political organization, 4. Professional, trade union or trade union organization, 5. Students or alumni association, 6. Parents Association Board, 7. Neighboring Association, 8. NonGovernmental Organization, 9. Volunteer or philanthropic association, 10. Self-Help Group, 11.

Sports Association, 12. Civil association of voluntary affiliation (i.e Scouts, Rotarians).

As an indicator of individual well-being, the survey captures two measurements: life satisfaction and happiness. These aspects are measured by asking individuals to self report them. For life satisfaction this rank goes from 1. dissatisfied, 2. few dissatisfied, 3. moderate dissatisfied, 4. satisfied. In the case of happiness, this goes from 1. Unhappy, 2. Little happy, 3 somewhat happy, 4. Happy. Considering these variables: the affiliation to a social network support, and their self-reported level of happiness and life satisfaction, seven matrices were made for the different dimensions of study. To incorporate geographical dimension we will follow INEGI classification of rural areas for populations from 2,500-14,999 inhabitants and urban areas for populations from 15,000-+100,000 inhabitants, this classification was the base for the sixth and seventh data matrix. To introduce the effect of violence, we used the Mexico Peace Index 2012 calculated by the Institute for Economics & Peace which report by city 7 key aspects: homicides, violent crime, weapons crime, incarceration, police funding, organized crime and justice efficiency, the index was calculated on a scale from 1.6 to 3.66, low rate violence places where considered below 2.66 and high rate locations above 2.66.

We are adopting the strategy of Brashears(2008, 2014) by using log-linear models, in our case we are interested in testing whether if there exist deviations from association and if this association given levels of happiness are significant, as well as

describe particular formulations that may account for the observed data (Agresti, 2002; Powers and Xie, 2000, see appendix for further explanation of this models). The analyses are based on the models used by Peter Marsden (1988) which include both pure homophily as well as social distance parameters. Unlike Marsden and following Brashears(2008,2014) the current models include respondent affiliation to a specific network represented by a layer variable alongside the row and column variables, transforming these models into three-way variants. The hypotheses are tested using a set of layer-effect specifications, discussed below, which convert the models into a type of constrained three-way log-multiplicative model or what Powers and Xie (2000, p. 138) refer to as a “heterogeneous association model. This study employs two methods of modeling pure homophily in the diagonal cells. The first method, constant inbreeding, assumes that all cells on the diagonal have equal levels of homophily. This method would fit, for example, if people in all networks groups have equally strong likelihoods of associating within their own group. The second method, differential inbreeding, permits each diagonal cell its own parameter indicating its unique likelihood of exhibiting homophily. This is equivalent to allowing these networks groups to vary in the chance of a homophilous association between people with a similar level of happiness -i.e. association to social network support.

The strategy adopted from Brashears(2008) is to use layer-effect parameters to model the differences in the association between males and females. First, we will estimate a constrained model, in which males and females are assumed to have

identical parameters. The parameters defining an association between respondent and alter network characteristics are forced to be the same and will provide a test for the uniformity hypothesis. Social networks associate people with same characteristic [ not only due to well-being self-reported levels]. Second, an unconstrained model allows male and female parameters to vary freely. In this case, the parameters defining the association between respondent and the kind of network to which they belong may be entirely different providing a test for the dissimilarity hypothesis. Finally, there is a proportional model in which the pattern of the parameters is held constant but the strength is allowed to vary (the proportionality hypothesis). The log-multiplicative layer-effect model developed by Xie (1992) will be used to test the proportionality hypothesis. This model is stated in Eq(3.0.1), here, a single parameter  $\phi$  is used to designate the variation between one layer and another:

$$\log F_{ijk} = \lambda + \lambda_i^X + \lambda_j^Y + \lambda_k^Z + \lambda_{ik}^{XZ} + \lambda_{jk}^{YZ} + \phi_k \lambda_{ij}^{XY} \quad (2.3.0.1)$$

In a two-layer model, the  $\phi$ -parameter for the non-reference layer indicates whether the strength of the row/column association is greater than the reference layer's ( $\phi_k > 1$ ) is weaker than the reference layer's ( $\phi_k < 1$ ), or is the same as the reference layer's ( $\phi_k = 1$ ). Here,  $\lambda$  refers to a particular parameter of interest and it provides the effect of the table size itself, while  $\lambda_i^X, \lambda_j^Y, \lambda_k^Z$  account for the main effects of the rows, columns, and layers, respectively. The next two terms,

$\lambda_{ik}^{XZ}, \lambda_{jk}^{YZ}$  are parameters accounting for the interaction between rows and layers, as well as columns and layers. Finally, the last term  $\lambda_{jk}^{YZ} + \phi_{ij}^{XY}$  models the interaction between rows and columns. It does so, however, with the  $\phi_k$  term indicating the effect of a particular layer on this single rowcolumn association. ( see Agresti (2002), Brashears(2008, 2014).

Similar as in Brashears(2008), we will have two stages: all models in the first stage use the unconstrained layer specification wherein this “within-groups stage, the preferred diagonal specification is determined by fitting and comparing the constant inbreeding model and the differential inbreeding model to the diagonal cells. To complete the analysis in this stage, former results are compared against results of a homogeneous and a heterogeneous social distance model known as Goodman RC models (Goodman, 1979, 1985). These models are estimated by fitting the off-diagonal cells to determine which model specification is preferred for the second state of analysis. The homogeneous RC model allows estimation of the social distance between a set of categories while constraining the parameters of the sending and receiving categories (rows and columns) to be the same. The heterogeneous RC model (Eq. (2)) allows the social distances among sending and receiving categories to differ:

$$\log F_{ijk} = \lambda + \lambda_i^X + \lambda_j^Y + \lambda_k^Z + \lambda_{ik}^{XZ} + \lambda_{jk}^{YZ} + \sigma_{ik} \nu_{jk} \quad (2.3.0.2)$$

In Eq(2.3.0.2) we use the same parameters as in Eq(2.3.0.1) but the rowcolumn association has been replaced with the multiplicative term  $\sigma_{ik}\nu_{jk}$ , where  $\sigma_{ik}$  reflects the category scores attached to particular rows in the contingency table and the  $\nu_{jk}$  portion reflects the category scores for columns. Collectively, the product of sigma and upsilon define a rowcolumn association which is the result of a linear relationship between the category scores for the rows and columns. When a constrained layer-effect fits, then  $\sigma_{ik}=\sigma'_{ik}$  and  $\nu_{jk}=\nu'_{jk}$  for all values of  $k$ , meaning that the category scores for rows and columns are the same for each layer. When an unconstrained layer-effect fits then  $\sigma_{ik}\neq\sigma'_{ik}$  and  $\nu_{jk}\neq\nu'_{jk}$  for one or more values of  $k$ , indicating that the row scores, column scores, or both, differ between layers in the table. Finally, when a proportional layer-effect fits the  $\sigma_{ik}\nu_{jk}$  term above may be rewritten as  $\phi_k\sigma_i\nu_j$ . A single set of category scores  $\sigma_i\nu_j$  will be modeled for all layers.

## 2.4 Results

We will start the analysis from general to specific cases. We will use the following statistics to select the model that supports our hypotheses. Let  $n_i$  be an observed cell count and  $\hat{m}_i$  and estimated expected cell count. The tables reported on the appendix included the  $\chi^2=\sum_i\frac{(n_i-\hat{m}_i)^2}{\hat{m}_i}$ , the likelihood ratio chi-squared statistic,  $L^2=2\sum_i\log(\frac{n_i}{\hat{m}_i})$ , number of degrees of freedom are represented by  $df$ =number of observed frequencies [number of (log-linear) parameters]. Selection among the

models relies upon the likelihood-ratio test statistic. This test compares the differences in  $l^2$  scores for both models to the  $\chi^2$  distribution with degrees of freedom equal to the difference in df between the models. A significant test indicates that the model with fewer degrees of freedom is preferred over the model with more degrees of freedom.

The results for residents in non-violent locations that self-reported high levels of happiness and life satisfaction in Table B.1 show that by fitting the two diagonal models yields a comparison between the constant and the differential inbreeding specification. This comparison has a  $\chi^2=667, df=1$ . Turning to the social distance specification, comparing the homogeneous version to the heterogeneous yields a test of  $\chi^2=373$  with 1 degree of freedom. This indicates that the heterogeneous is preferred over the homogeneous social distance. In fact, respondents with high levels of self-reported happiness do exhibit different levels of homophily affiliation to social networks. The results demonstrate that rows and columns are not spaced identically or the propensity to affiliated to a network is not the same among males and females. A further analysis that used a heterogeneous row and column effect specification with a differential inbreeding shows that model 9 incorporates a proportional diagonal term with an unconstrained social distance term; compare with a proportional model 7 yields a  $\chi^2=15.69, df=10, p=0.1120$ . These results indicate that people who reported high levels of happiness have proportional tendencies towards homophily, however, the strength of association is different between males and females.

Turning to models of violent locations and high levels of happiness in Table B.2, in the withing-groups stage the differential inbreeding specification is preferred over the constant inbreeding specification ( $\chi^2=450.49$ ,  $df=1$ ). The social distance comparison indicates that the heterogeneous version fits better than the homogeneous version  $\chi^2=8$ ,  $df=1$ ,  $\rho=0.0047$ . The affiliation behavior in these locations differs from non-violent places. In the between-groups (stage 2), the model preferred uses an unconstrained diagonal specification as well a proportional (Xie) social distance,  $\chi^2=16.65$ ,  $df=11$ ,  $\rho=0.1187$ . These results support the dissimilarity hypothesis for the diagonal cells and the proportionality hypothesis for the off-diagonal cells.

Since people in violent and non-violent locations shows different tendencies towards a network affiliation, the scores of the log log-linear parameters are resumed in Table B.11. These row and column scores are the  $\beta$ 's of the preferred models. The results show that men in non-violent locations are more likely to affiliate to political parties and NGOs, females are more likely to associate with the church, the board of parents and volunteer or philanthropic associations. The  $\beta$ 's of violent locations for men for the preferred models show that they are more likely to associate to sports associations and professional, trade union organizations, females are more likely to associate with the church and the board of parents.

Turning to lower levels of happiness in non-violent locations, Table B.3 shows that the within-group the differential inbreeding specification is preferred over the

differential inbreeding  $\chi^2=53.33$ ,  $df=1$ . The social distance comparison indicates that the heterogeneous version fits better than the homogeneous version  $\chi^2=6.08$ ,  $df=1$ ,  $\rho=0.0137$ . The preferred model that emerges in the between-groups stage, model 9, uses a Xie layer specification as well as unconstrained social distance parameter  $\chi^2=5.53$ ,  $df=10$ ,  $\rho=0.8531$ . The results support the proportionality hypothesis for the diagonal and the dissimilarity hypothesis for off-diagonal cells. The effects of violence in people's affiliation network support does not change the path to affiliate but in the strength of such patterns. The results for violent locations and low happiness shows that the preferred model that emerges in the between-groups stage, model 9, uses a Xie layer specification as well as unconstrained social distance parameter  $\chi^2=10.61$ ,  $df=10$ ,  $\rho=0.3887$ . The scores of rows and columns in Table B.11 shows that people are more likely to associate to professional, trade union organizations and females to volunteer or philanthropic associations. Violent and low levels of happiness show that men are more likely to associate with groups or associations that promote some religious values different than church and political parties, females are more likely to associate to the board of parent association.

To extend these findings, we incorporate spatial dimension for urban and rural areas, marital status, and education. In urban areas (populations more than 15,000, Table B.5), in the within-groups the differential inbreeding specification is preferred over the constant inbreeding specification,  $\chi^2=504.38$  and in the social distance specification the heterogeneous model fits better than the homogeneous  $\chi^2=15.54$ ,  $df=1$ ,  $p<0.0001$ . Similar to the previous procedure, we estimate

three different layer-effect parameters and we find that the model 9,( Xie diagonal & unconstrained social distance) fits better by comparing with the rival model 11, $\chi^2=25.97$ ,  $df=10$ ,  $p<0.0038$ . The results for urban areas support the proportionality hypothesis for the diagonal cells and the dissimilarity hypothesis for the social distance.

To compare these results we include rural areas (populations less than 15,000 in Table B.6), the within-groups stage the differential inbreeding specification is also preferred over the constant inbreeding specification, $\chi^2=400.21$  and the social distance comparison indicates that the heterogeneous version fits better than the homogeneous version  $\chi^2=0.68$ ,  $df=1$ ,  $p<0.4096$ . The model in rural areas, by using a layer effect parameters, shows that the model 9,( Xie diagonal- Unconstraint social distance) is preferred against the model 7 ( proportional Xie), $\chi^2=4.38$ ,  $df=10$ ,  $p<0.9286$  The results for urban and rural areas maintain the general results: patterns of general affiliation to a specific network have proportional tendencies towards homophily and this strength is different. In urban areas, women are similar to associate to board parent associations in a fewer proportion than females of rural areas who are more likely to affiliate with a religious group. On the other hand, males from urban areas are more likely to associate to league or sports association and in rural areas, they are more likely to associate to NGOs.

Turning to education, in the withing-group stage for high school level in Table B.7, the differential inbreeding specification is preferred over the constant inbreeding specification  $\chi^2=668.87$ . The social distance comparison indicates that the het-

erogeneous version fits better than the homogeneous version  $\chi^2=13.54$ ,  $df=1$ . The preferred model that emerges in the between-groups is the Model 11 which uses an unconstrained specification as well as proportional social distance parameter,  $\chi^2=15.26$ ,  $df=11$ ,  $p<0.1709$ . Although the model 9 has 1 degree of freedom lower the model 11 has a higher p-value and a lower BIC ( $L^2-df \log N$ ). These results support the dissimilarity hypothesis for the diagonal and the proportionality hypothesis for off cells.

Continue with education for college level in Table B.8, the results show that in the within-groups stage the differential inbreeding specification is preferred over the constant inbreeding specification  $\chi^2=327.45$   $df=1$ . The social distance comparison indicates that the heterogeneous version fits better than the homogeneous version  $\chi^2=6.11$ ,  $df=1$ ,  $p<0.0134$ . The preferred model that emerges in the between-groups stage, is the model 9. In general terms, the educational categories differ proportionally in terms of homophily,  $\chi^2=9.81$ ,  $df=10$ ,  $p<0.4573$ . These results support the proportionality hypothesis for the diagonal and dissimilarity for the off-diagonal cells. The difference in social distance between males and females shows interesting results for high school and college levels for males and females. Males with high school education level are more likely to associate with a league or sports organizations and less likely to a religious group. The counterpart from college levels exhibits high likelihood to associated with sports associations and political parties and less to religious groups. Females in high school associate are more likely to religious groups and board of parents the counterpart with a college education are more likely to associate to philanthropic associations and

associations that promote some religious values different than the church.

Turning to marital status, for singles males and females in Table B.9, the within groups reveal that the differential inbreeding specification is superior to the constant inbreeding specification  $\chi^2=21.96$ ,  $df=1$ . The results indicate that the heterogeneous specification achieves better fit than the homogeneous specification  $\chi^2=0.41$ ,  $df=1$ ,  $p<=0.5220$ . In the between-groups, the preferred model 9 contains a Xie diagonal specification and an unconstrained social distance 2 which support the proportionality hypothesis for the diagonal and the dissimilarity hypothesis for the off-diagonal cells,  $\chi^2=8.46$ ,  $df=10$ ,  $p<0.5840$ . The row and columns score in Table B.11 show that singles males are more likely to associate with a league or sports associations and less likely to associate with the church. Single females are more likely to associate to professional organizations. With respect to married males and females in Table B.10, the within groups reveals that the differential inbreeding specification is superior to the constant inbreeding specification, however, and a heterogeneous is selected  $\chi^2=587.43$ ,  $df=1$ . In the between-groups of stage 2, the preferred model 9 support the general findings where the proportionality hypothesis is supported for the diagonal cells and the dissimilarity for the diagonal cells,  $\chi^2=74.94$ ,  $df=12$ ,  $p<0.0001$ . From Table B.11, the row and column scores show that married males are more likely to associate with sports associations and voluntary associations; married females are more likely to associate to the church and board of parent associations.

## 2.5 Discussion

Social network support has an important role in people's happiness and life satisfaction, the present research studied homophily differences between males and females affiliated to specific social network support, their subjective well-being and levels of violence they are exposed. General results suggest that exist proportional tendencies towards homophily and this strength differs markedly for males and females. In terms of Tables B.1 & B.2 males and females who reported a high level of happiness have proportional tendencies to homophily. Females are likely to associate with a religious organization, parent association, neighboring association and dissimilar to a political party. Males are less likely to associate with religious groups and likely to associate with political parties and parent association. These results do not change if we expand the analysis to urban and rural areas. Religion organization and NGO's are the networks of support for residents in violent locations.

Turning to marital status, females a social support network from extended homophily peers network is more often offered to married females who have fewer immediate peers to help support them. They may also reflect stressors created by immediate members who themselves require time, energy and support. The case of males is similar, frequent contact with extended homophily peers improved well-being (political parties or sports league association). In terms of levels of education, men and women are identical. Brashears (2008) states that "differences that may exist between the sexes are not sufficient to defeat the influence of ed-

ucation itself. It seems likely that the impact of education is driven, at least in part, by education's relationship with an occupation. To the extent that a particular education level lends itself to specific careers, the association will be driven by spatial location rather than by a respondent's sex; at least, it seems, for non-kin associations". Herminia Ibarra has noted the different ways that males and females form relationships in work settings (Ibarra, 1992) and other researchers McPherson and Smith-Lovin(1987) have determined that men and women often participate in organizations with different characteristics.

Education provides different results to support our hypothesis. High School level' respondents (males and females) with a high level of happiness in violent places are more likely to affiliate league or sports association. High school' level respondents with low levels of happiness are more likely to affiliate with religious groups. In all dimensions, we found that the proportional differences are for the greater involvement of women in community activities than men, and the resulting tendency to form ties based on that particular locus (Feld, 1981). Education has an important effect on the kind of network to be associated. (Tables B.4,B.5 and B.11). Marital status accounts for these differences where single males more likely to associate with league or sports association and less likely to associate with a religious group, in the case of females they are less likely to associate with sports association, but likely to associate with religious groups and the board of parents. While males and females proportional path to a homophilous association, social distances are stretched or lengthened for women relative to men. In sum, these findings support the idea that males and females differ (proportional) in they way

they affiliate with a specific network which provides different support services for an improvement of their well-being.

## **2.6 Conclusions**

There is a growing interest in understanding social network support as an important factor that explains people's well-being in violence scenarios. Community practices are often driven by social norms ( e.g helping each other seeking providing support) or as an objective way to ensure safety in one's surroundings by violence. Christakis (2016) stated that ongoing investigations explore the genetic basis for human social behaviors and the application of social network principles on a population scale, in order to change behavior related to health, cooperation, and economic development.

By using layer-effect parameters to explain the two-way relationship between social support and well-being, we found evidence that supports Blau's (1977) "primitive theory of social structure by suggesting that the significance of dimensions for an association is largely a characteristic of societies as a whole- at least where non-kin ties are concerned. The consistent similarity of males and females in terms of pure homophily supports this approach. The exploration of the two-way relationship between males and females, their self-reported well-being and violence exposure should extend the analysis to include the social media or network analysis of network size, kinship roles, interaction (proximity, contact, and

co-residence) and social influence. Our contribution is to identify the concrete sources of the differences in male and female social distances and homophily for non-kin relations. These differences either reflect different structural constraints or suggest that for some reason the same constraints affect males and females in different ways. With respect the effect of violence on people's psychological well-being, Leva (2006) suggests that the role of the environment is of importance, a component of the neglected effect on violence and sensibility is due to other related factors ( e.g gender or age of the victim). Kaplan et al.(2005) have identified a group of factors including reliefs and, ideological commitment and social capital, that have protected communities which were exposed to violence. De Choudhury et al. (2014), stated that the chronic exposure to violence in Mexico is associated with lowered affective responses in Twitter posts of citizens experience of the violence, leading to possible signs of desensitization in their social media postings. With this in mind, our results contribute to the literature to explain homophily differences in risky environments.

## CHAPTER 3

### RISK PERCEPTION, POLICY PREFERENCES, AND PRO-SOCIAL BEHAVIOR: EXPERIMENTAL EVIDENCE IN RISKY ENVIRONMENTS.

#### 3.1 Introduction

There is a growing interest in the literature that focuses on the relationship between individual's attitudes towards risk and their response to major changes in their environment. Social technologies have been used to respond to crisis (i.e terrorist attacks, natural disasters). However, to our knowledge, the crisis informatics literature, despite studying a wide range of events (e.g., [De Choudhury, Monroy-Hernandez, Gloria Mark (2014), Cheong, M & Lee, V (2010), O'Connor, K.A. (2013)]), has not examined emotional expression of citizens experiencing urban warfare. This study will investigate emotional responses to test risk perception, policy preferences, and pro-social behavior of residents who have been exposed to violence. The results have implications for public policy, as social media could potentially be used as a barometer of negative psychological impact on citizens. A growing interest in the empirical literature on this topic has led to the development and improvement of methods to elicit and measure these attitude and to know whether risk attitudes change depending on the individual's circumstances (Voors et. al., 2012, Callen et. al., 2014; Cameron and Shah, 2013; Guiso et. at., 2013). These studies assume that differential exposure can be correlated with pre-existing characteristics of the locality, and risk attitudes may play a

role in geographic sorting. It is likely that a non-causal association exists between exposure and risk perception.

This paper addresses these challenges by contributing to the understanding of risk perception in terms of a possible threat relate to the exposure to violence. The outbreak of the violence in the Drug War in Mexico will be the environment to study risk perception, preferences, and pro-social behavior for different reasons. First, the continuous wave of violence and exposure to implicit and explicit crimes in the Mexican Drug War is an example of the type of armed conflict that has exposed civilians and government agents over a period of time. Furthermore, the conflict has triggered an increase in criminal activities such as extortion, and kidnappings affecting the general population [De Choudhury et al. (2014), Miroff, N. (2012)]. The generalized violence in most Mexican cities, coupled with constrained- information reporting on news media, has contributed to the emergence of collective networks, alerting citizens by using platforms like Twitter and Facebook either to inform and collectively grieve and action, or critique, and express frustration about the violence in the streets [Monroy-Hernandez et al (2013)].

Osorio (2015) studied the constant wave of violent events related to the drug war in Mexico from 2000 to 2010 by analyzing the interactions between the state and organized criminal organizations. The paper proposes to use a method to collect a large database of criminal event data containing which gather more than 1.6 million observations. The research used spatial econometrics to provide evidence of

the spatial diffusion of violence. In congruence with the theoretical expectations, his results show that the disruptive effect of law enforcement is an important catalyst for the intensification of violence between criminal organizations in areas hosting a high concentration of criminal groups.

There are several potential mechanisms through which this Drug War violence may have an impact on judgments about risk and their respective behavior towards preferences. One driver mechanism is the open visibility of the violence, Mexicans living near violent locations are expected to be psychologically exposed. This exposure to violence either directly or indirectly may affect their well-being and the perceptions that people might have on the riskiness of the environment and the way they behave when they face other risks. Preferences and risk measures depart from the idea of utility-based models of behavior under uncertainty (Arrow, 1970; Pratt, 1964; Gollier, 2000).

The present research aims to address two main research areas: (1) empirical measures of risk judgments as capturing underlying policy preferences, (2) attitudes towards risk in violent scenarios and pro-social behavior. To explore these research areas, we implemented an on-line experiment to prove two main hypotheses. The first hypothesis lies in the appraisal-tendency theory [Lerner et al. (2003)]. We found a particular path of behavior of 111 respondent residents in violent and non-violent locations. The major contribution to the literature is that by controlling for individual treatment effect based on appraisal tendency theory, “an anger treatment triggered in one situation evokes optimistic risk es-

timates and risk-seeking choices. A fear treatment does the opposite, evoking pessimistic estimates and risk-averse choices.” Another contribution is based on a second hypothesis which lies with the perception of risk and risky decision making. In particular, risky decision making suggests that people are loss-averse they dislike losses much more than they like equivalent valued gains (Kahneman and Tversky, 1979). By using an weak identifiable victim effect on an on-line modified dictator game [Small and Lowenstein (2003)], we provide evidence that suggests that “people see saving a statistical life as gain, but saving an identified victim was seen as avoiding a loss, this then predicts that people put greater value on identified victims than on statistical ones”.

### **3.1.1 Institutional Environment: Drug War in Mexico**

De Choudhury et al.(2014) characterize “the Mexican Drug War as an ongoing armed conflict among rival drug cartels fighting each other for regional control and against the Mexican government forces and civilian vigilante groups”. It was reported in 2011 that this Drug War had taken over 60,000 lives [Booth (2012)] and has displaced between 230,000 and 1.6 million people. However, Beittel (2013)’s reported for Members and Committee of Congress Mexico’s Drug Trafficking, and the Trans-Border Institute (TBI) at the University of San Diego state that set the homicide statistics over 120,000 victims that include cartel members, majors, officials, journalists, and innocent civilians. This wave of violence over time is taking a hidden psychological toll on citizens as well: the forced disappearances of

people, for instance, take a huge emotional toll on the families and the community [Hernandez (2012), Michelsen, M (2012), Beittel (2013); Guerrero& Gutierrez (2011); Molzan et. al., 2012 , Diaz-Cayeros et. al., (2011)]. Furthermore, small business owners are extorted and threatened with death by petty criminals taking advantage of the climate of fear [Cawley, M (2013),]. The hijacking of the control over violence has also led to a continuing deterioration of the Mexican social fabric and has been known to lead a detrimental impact on behavioral health, apparent in symptoms of post-traumatic stress and anxiety. In fact, as early as 2010, local health officials had reported a significant increase in the number of people seeking mental health help with post-traumatic stress disorder (PTSD) induced by drug-related violence [O'Connor, K. A. (2013)]. Similarly, the international news media have reported how Mexicans are “numb to carnage [Archibold, R., and Cave, D. (2012).] and even kids are “exposed to such violence”.

### **3.2 Violence: Risk perception and Policy Preferences**

There are few studies in the literature that test the appraisal-tendency theory and risk perception in violent scenarios. Most of the analyses have focused on the economic or social consequences or armed conflicts. For example, Hoeffler&Reynal (2003) examined the economic and human cost of civil war during 1960-1999. By using a global dataset, they found that a civil war of five years reduces the average annual growth rate by more than two percent. Their survey of the human

costs of conflict showed that even long after the war stops the mortality rate increases mainly due to the destruction of public health infrastructure and population displacements. Zussman&Zussman (2006) analyzed the effects of counter-terrorism policies, in particular, the effectiveness of Israel's assassinations policy. Their findings showed that terrorism has had an adverse macroeconomic effect on Israel's economy. Likewise, Abadie&Gardeazabal (2003) investigated the economic effects of conflict in the Basque Country as a case study. Their findings support the fact that after the outbreak of terrorism in the late 1960s, the per capita GDP in the Basque Country declined about 10 percentage points relative to a synthetic control region without terrorism, supporting the idea of terrorism developing scenario. Besley&Mueller(2012) exploited data on the pattern of violence across regions and over time by estimating the impact of the peace process in Northern Ireland on house prices. Akresh&Walque (2008) examined the impact of Rwanda's 1994 genocide on children schooling by combining two cross sectionals households' surveys collected before and after the genocide. By using an identification strategy -pre-war data were used to control for an age group's baseline grade level- they explain variation across provinces in the intensity of killings and on which children were school-aged when exposed to the war. Their findings showed a negative impact of the genocide on schooling, with the exposed children completing one-half year less education. Beber&Blattman (2010) investigated child soldiers by interviewing former members of Uganda's Lord's Resistance Army and by using principal-agent models that incorporate punishments, indoctrination, and age-varying productivity. They found that children are more

easily indoctrinated and disoriented than adults, but are less effective guerrillas; hence the optimal targets of coercion were young adolescents. Rockmore (2011), studied the effects of the general welfare due to violence in Northern Uganda. This work is the first estimate of the economic cost of risk violence separate from the actual experience of violence and finds that there is a significant mechanism by which conflict influences development.

On the other hand, if we consider the role of choice and risk perception, the major contribution has been made by Slovic et al. (1980,1984,1982). Their work indicated that subjective judgments, made by experts are a major component in any risk assessment. Judgments are evaluated based on risk scenarios, activities, and technologies. They found that the perception of fear might be bias when experts made judgments about risk, however, “if judgments are faulty, efforts at public and environmental protection are likely to be misdirected”<sup>1</sup>. Lerner, Small, and Fischhoff (2003) studied the effects of fear and anger on the perceived risk of terrorism by setting an experimental design on which they predicted opposite effects for anger and fear on risk judgments and policy preferences.

We might expect several drivers through which Drug War violence might affect people’s levels of risk aversion, preferences, and pro-social behavior. De Choudhury et al. (2014) found that affective responses in social media might indicate desensitization to violence experienced in communities embroiled in an armed conflict. This diminishing sensitivity might suggest that people living in

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<sup>1</sup>Slovic et al.(1980)

high-risk environments might act in a less risk averse way as they are not as concerned about risks that seem small relative to their general setting (Quiggin, 2003). Therefore, the Mexican population not explicitly exposed to Drug War violence might perceive the environment as riskier and behave in risk averse way when they make a pairwise comparison with other choices.

Osorio (2016) found that people living in environments deeply affected by violence might be willing to approve the implementation of harsh security policies, even at the expense of the respect of physical integrity. In the context of the Drug War in Mexico, his research “seeks to understand why some individuals support the use of torture to fight crime. The argument claims that support for torture stems from the convergence between perceptions of insecurity, exposure to violence, and institutional trust. His results show that national and local security threats have heterogeneous effects on torture approval. Heightened perceptions of contextual insecurity increase torture approval, while direct exposure to violent situations undercut support for torture”. In addition, his results indicate that torture approval is mediated by low levels of institutional trust.

There is a vast literature that explores the impact on risk attitudes of violence by relying on information collected before and after the change in the conflict environment. A common limitation is to depend only on spatial changes in levels of violence, for example, considering violence as endogenous and omit factors truly correlated with risk aversion. Another limitation is the identification of behavioral responses related with both with environmental and risk attitudes [ (Voors et. al.,

(2012), Callen et. al., (2014)]. In both cases, the analysis will provide biased results. Another limitation when trying to establish causality between violent crime and risk attitudes by comparing data before and after a point of conflict is related with economic downturns at the level comparison (Dell, 2015; Velsquez, 2014). The experimental-empirical literature based on risk perception, policy preferences and pro-social behavior on violent environments is still scarce. This research aims to contribute to this literature by directly addressing these concerns through the use of an experiment on a general population exposed to the Drug War violence in Mexico. The following section will discuss the relation between violence and pro-social behavior.

### **3.3 Violence: Pro-Social Behavior and Victim Effect**

Meier (2006) made an extensive survey of economic theories of pro-social behavior. According to this work, in a number of situations, people behave not according to narrow self-interest, but rather pro-socially. The self-interest hypothesis has been rejected in a large number of laboratory experiments. However, various models have been developed to analyze how an individual is interested in the fortune of others and whether these motives can explain pro-social behavior. Meier(2006) classified these models on: “(1) outcome based on pro-social preferences theories that assume that an individual’s utility depends directly on the utility of other people; (2) theories of reciprocity that are based on the notion that

individuals behave in a friendly manner when they are treated benevolently and, conversely, they act meanly when treated badly; and (3) approaches stressing the importance of self-identity for pro-social behavior”.

In the case of our study, contextual factors<sup>2</sup> and institutional environment<sup>3</sup> might have effects on pro-social behavior, however the effects may be twofold, first, because the way on which the decision is framed has an influence on the decision (Meirer 2006, Andreoni 1992; Cookson 2000).

Second, an institutional environment can trigger motives that go beyond altruism and reciprocity, in Bohnet and Frey (1999a; 1999b) and Frey and Bohnet (1995), by setting up a dictator game in one-way identification treatment, they found changes in the willingness to cooperate. This shift in behavior can be explained by reciprocity because according to these authors, identification should not change people’s decision. Third, verbal framing is not the only contextual factor in experiments that influence pro-social behavior. Real life’s social contexts “contain a variety of cues that shape individuals choices to act pro-social, in addition to the institutional environment in which people decide to contribute” [Issac(1991)].

On the other hand identification influences decision, Schelling (1968) devel-

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<sup>2</sup>Contextual factors are facts or statistics that play into people’s behavior and well-being. There are two types of contextual factors: the community in which people live and the neighborhood environment

<sup>3</sup>The institutional environment refers to two essential dimensions of neighborhood life: the physical surroundings (e.g. cleanliness, order, and appeal of facilities and adequate resources and materials) and neighborhood connectedness or how positively engaged and involved people are in neighborhood life.

oped the idea of “identifiable victim effect”, the death or a struggling situation of a particular person invokes “anxiety and sentiment, guilty and awe, responsibility, and religion, [but]...most of this awesomeness disappears when we deal with statistical death.” Following Schelling, identifiable victims stimulate an emotional response than statistical victims. Jenni and Loewenstein (1997) stated four potential causes of the identifiable victim effect. The first cause is that most identifiable victims are more vivid than statistical victims, especially when details are communicated.

Second, “identifiable victims are certain victims, whereas statistical victims are by definition probabilistic”. They stated that research on risky decision suggests that people are loss-averse they dislike losses much more than they like equivalent value gains (Kahneman and Tversky, 1979). If “saving a statistical life is seen as a gain, but saving an identified victim is seen as avoiding a loss, then this predicts that people will place greater value on identified victims than on statistical ones”<sup>4</sup>. Third, evaluation of an identified victim is made *ex-post*, whereas the evaluation of a statistical life is made *ex-ante*. The fourth case is the reference group, people feel greater concern toward victims as the reference group they are part of grows smaller. Small and Loewenstein (2003) found a weak form of identifiability-determining the victim without providing any personalizing information increases caring. They state that the idea that the identifiable victim effect is “just” a reference group effect is somewhat surprising and seems to conflict with Schelling (1968).

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<sup>4</sup>Small & Loewenstein (2003)

### 3.4 Hypothesis, Data and Methods

The aim of this research is to analyze risk preferences and pro-social behavior in contextual and institutional factors of violence. To test risk attitudes and policy preferences we will follow two experimental designs. The first experiment uses a modified version of Lerner et al. (2003) which is based on the appraisal-tendency theory. Lerner & Keltner (2000, 2001) have demonstrated that some negative emotions trigger optimism. Appraisal-Tendency theory assumes that emotions not only arise from but elicit cognitive appraisals. Such appraisals, although tailored to help the individual response to the event that evoked the emotion, persist beyond the eliciting situation becoming an implicit perceptual lens for interpreting subsequent situations. For example, Lerner et al. (2003) state that fear arises from (Smith & Ellsworth 1985) and evokes appraisals of uncertainty and situational control (Lerner & Keltner 2001), two central determinants of risk judgments (Slovic 1987). The wave of Drug War violence and the role of social media have showed that while violence was rising in cities affected by the Drug War, there is evidence that shows a decline in negative emotional expression as well as rising emotional arousal and dominance in social media, in particular, Twitter posts: aspects known to be psychological markers of desensitization, De Choudhury (2014). Based on Appraisal-Tendency theory our research aims to test negative emotions, our first hypothesis is:

**Hypothesis 6.** *If anger<sup>5</sup> is triggered in one situation; it will evoke optimistic risk esti-*

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<sup>5</sup>A feeling of tension and hostility, usually caused by anxiety aroused by a perceived threat to

*mates and risk-seeking choices. Fear<sup>6</sup> does the opposite, evoking pessimistic estimates and risk-averse choices. Likewise, being afraid<sup>7</sup> will evoke pessimistic estimates.*

To test pro-social behavior we will follow a modified victim effect identification treatment based on Small and Lowenstein (2003). The perception of risk and decision-making process suggest that people are loss-averse they dislike losses much more than they like equivalent valued gains (Kahneman and Tversky, 1979). If this is true, our second hypothesis is:

**Hypothesis 7.** *People will see saving a statistical life as a gain, but saving an identified victim is seen as avoiding a loss, then this predicts that people will put greater value on identified victims than on statistical ones.*

Most experimental studies involve dictators games where in a standard version an “allocator is presented with an endowment and is given the opportunity to split the endowment with an unknown recipient. Although, some economic models assume that selfishness predicts that allocators will keep the entire endowment for themselves, in fact, many allocators give a positive amount (see Camerer and Thaler, 1995, for a review of findings). In this proposal, we will consider respondents as “allocators” as potential donors.

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one’s self, possessions, rights, or values.

<sup>6</sup>Fear is the physical and emotional response to dangerous or threatening situations that prepare the body to fight or flee the situation.

<sup>7</sup>“To fear” and “to be afraid of” are interchangeable. The meanings of afraid are mainly feeling fear or anxiety; frightened, worried that something undesirable will occur or be, unwilling or reluctant to do something for fear of the consequences.

## Method: Part A

Considerable research has demonstrated the importance of examining specific emotions rather than global feelings [ Lerner & Keltner 2000, 2001; Keltner, Ellsworth, & Edwards 1993; Tiedens & Linton, 2001, DeSteno, Petty, Wegener, & Rucker 2000; Lerner et al.(2003)]. However, to prove our hypotheses, we set up an experiment online to provide a quantitative measure of risk judgments, risk attitudes and pro-social behavior in violent and non-violent locations. The experiment was hosted on Facebook recruiting respondents by using ads and which were targeted to Mexican users who were asked to spend 15 minutes to participate in the study and offering them \$10 dollars in Amazon gift cards. This study used a modified experimental treatment in Lerner, et al. (2003), in which: "respondents initially answer demographic questions and a small survey questioning about their mood. Respondents will receive at random three-emotional conditions. The first emotion conditional uses a text like the following: The Drug War violence, corruption, and inequality in Mexico evoked a lot of emotions. We are particularly interested in what makes you most ANGRY about these issues. We asked them, What aspect of these problems makes you the most ANGRY? Why does it make you so ANGRY?. The other two conditions replaced "ANGRY with "SAD or "AFRAID. Following these questions, the respondents in each condition will see a picture about Drug War violence, protesters, evoking the target emotion."<sup>8</sup>The emotional condition treatment was given to respondents randomly in-

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<sup>8</sup>Lerner et al.(2003)

dependent of the city of residency. Following Lerner et al.(2003), each respondent judged risk in three ways, differing in response mode, focal event, and risk target. This study uses three different frames of risk perception. The first considers the likelihood that future violent events will occur in Mexico within the next 6 years. This frame of risk considers 6 possible events

### **Risk of Future events of Drug Violence & Corruption in Mexico**

- The Insecurity related with the Drug War will reduce within the next 6 years (e.g. low rate of murders, extortion, smuggling, thefts, kidnappings, beheading).
- The safety in your city will improve dramatically as a result of the government' strategy against Drug Traffic Organizations (DTOs).
- A violent event related with Drug War will occur within the next 12 months.
- A corruption event involving government will occur within the next 6 years.
- Mexican Government's strategy of Drug War will be able to end with DTOs.
- The Mexican Government will improve in the next 6 years.

These events have a 4-response scale anchored at 1 (extremely unlikely), 2 (Unlikely), 3 (likely), 4 (extremely likely). It is possible that placing greater analytic demands on respondents might diminish emotion effects to test this possibility, we included two other frames of risk scales that ask respondents to generate precise probabilities:

**Risk Perception for future events of Drug Violence and Corruption for self within the next 12 months.**

- Insecurity
  - Murder
  - Extortion
  - Theft
  - Kidnapping
  - Rape
- Experience corruption, injustice, and abuse of power from your local government
- Experience explicit drug violence
  - Shootings
  - Narcobloqueos<sup>9</sup>
  - Narcomantas<sup>10</sup>
  - Drug trafficking or see the presence of Drug Traffic Organizations

These risk estimates have a 4-Likert type scale ( 1-Extreme unlikely, 2- Unlike, 3-Likely, 4-Extreme Likely). The third frame of risk considers the same aspects

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<sup>9</sup>Block Trafficking by gangs members in strategic points of a city to avoid police authorities or military to accede to a violent event. Usually by kidnapping public transportation or private cars which are taken randomly and turn them on fire.

<sup>10</sup>A message left by a drug cartel on a cloth banner, usually containing threats or explanations of criminal activity

but such events might be experienced by an average Mexican within the next 12 months.

### **Policy preferences**

To test the effect of violence on people's policy preferences, respondents will evaluate four possible public policies related to Drug War violence and corruption in Mexico on a 5-point scale anchored at 1 (strongly opposed), 2 (somewhat oppose), 3 (neutral), 4 (somewhat support), and 5 (strongly support). The aspects considered were:

- Partial legalization of Drugs (cannabis, cocaine)
- Death penalty for person convicted of murder
- A law that allows an average Mexican to buy a gun for home protection
- Define categories of fines to citizens who carries some minimum quantities of drugs no for trade instead go to prison

After the participants evaluated these options and selected their stance towards them, (as a reinforcer of the treatment) we showed them some pictures related Drug War violence. Immediately, they were asked how they feel. After they report their mood, the screen will remind them that due to his/her participation they will receive \$10 dollars (in 5 dollar gift cards from Amazon). To identify

pro-social behavior, we will follow a weak form of identification used on the experiment in Small and Loewenstein (2003) which is explained in the next section.

### **Method: Part B**

Immediately after they report their mood about Drug War and their policy stances, respondents will read a short message: "Considering the problems of Drug War, corruption and inequality in Mexico, there are organizations whose main objective is to help victims that suffer from poverty and marginality, natural disasters, one of the institutions is Caritas Mexicana. The respondents will read a paragraph on which they are requested that regardless of whether they thought if they would be interested or not in donating any gift cards that they had earned (any amount of the \$10.00 gift). We used two control conditions which are blind to respondents. These control conditions were included in the request and they were randomly distributed between the respondents. The control condition consists of the words "will choose" and "has been selected". This treatment is considered the "determined" and "undetermined" condition and such verbal treatment are presented in brackets in the following text as follows:

"Several people in Mexico are in a struggle and have applied to receive help, some of them are victims of the Drug War in Mexico. Caritas Mexicana protects the confidentiality of applicants, but here are brief descriptions of the families whose names are excluded: "

1. A single man in his thirties, with two brothers, a disabled kid (20 years old) and a pregnant female of 25 years. He is unemployed and lives in a poor community in Aguas Blancas, a place where in 1995, he lost his parents in a massacre.
2. A single mom who lives with her 3 children and her mother. Her kids' ages are 4, 2, and 5 months. Her husband is one of the 43 students missing since September 2014.
3. A single man on disability after a shooting with police and has struggled with drugs. He used to sell drugs on the street. His family is taking care of him, his father and mother work to support him. Both parents are between 50 to 60 years old.
4. A single mom with 3 kids ages 14, 11, 9, she used to work in government but she was fired because she noticed that her boss was involved in corrupt acts and she decided to accuse him. She is 45 years old and unemployed.

"100 percent of the money raised will go to help the victims. Caritas Mexicana has already decided [will decide], based on each case, which of the victims just described is the neediest. If you would like to donate any of the gift cards that you received for completing this survey and help the victim that Caritas Mexicana has chosen [will choose], please choose the option of what amount you want to donate." Then after they choose whether they donate or not, a screen will show them the codes of their gift cards they decided to keep if any. A clarifying note: All the cases presented are hypothetical. In this weak form of experiment identifiabil-

ity is manipulated by informing respondents that some people either “have been selected” or “will be selected”. In neither condition were respondents told which people have been or would be selected, the only difference between conditions was if whether the decision had already been made.<sup>11</sup>

### **3.4.1 Recruitment Method**

The recruitment in traditional behavioral experiments is by using Amazon Turk. This paper focuses on a particular target population on which the existence of Amazon Turk is limited. In addition, the research might be considered limited by the ability to access a population of interest. One promising method for recruitment is the use of online advertisements(ads). Online ads compare with traditional recruitment strategies are preferred in terms of financial cost [Arcia(2014), Williams, Proetto, Casiano,&Frankling,2012], and number of labor hours required [Battistella, Kalyan,&Prior,2010]. Facebook ads as a recruitment method have a low per-participant cost allowing to target ads to users profile most likely to be interested in a specific area. Some studies have use Facebook advertisements as one of a variety of recruitment strategies [Arcia(2014),Ahmed, Jacob, Allen & Benowitz (2011), Batisella et al., (2010), Jones & Magee (2011), Richiardi, Pivetta, & Merletti (2012); Ryan & Xenos (2011), Williams et. al (2012)]

Inclusion in this study was limited to the Mexican population aged 18 to 60 years

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<sup>11</sup>Small and Loewenstein (2003)

old that have access to the Internet and have a Facebook account. Facebook was selected for several reasons: First, the Digital Market Outlook showed that in 2015 the number of Facebook users in Mexico was 41.26 million. In 2018, the number of Facebook users is expected to reach 54.16 million. Second, social media have emerged as prominent information sharing ecosystems in the context of a variety of crisis, the response in social media suggest that Mexicans use it to share opinions about the violence experienced in the country [see Choudhury, Monroy-Hernandez, Mark(2014)]. For these reasons, Facebook was selected to implement the recruitment. The sample collected auxiliary demographic variables -gender, marital status, education level, age, household size, income level, state and county of residence-. The recruitment was made by using Facebook's self-service application to create 4 ads, each accompanied by a different image but with identical copy: Do you live in Mexico? Participate in this survey and win dollars in this study. Clicking on the ad led users to a welcome page on which it is explained that if they decided to participate they will receive \$10 dollars in Amazon gift cards. The page explained that all information provided is anonymous and if they consent to participate they might log in by using their Facebook account. No recording of personal information was made. Facebook Ads include a map of Mexico, a Cornell University Logo and a text "Survey Social Networks and Subjective Well-Being" (See Supplementary Figure 1 attached in Appendix -Annex 1). The Ads were adhered to Facebook guidelines. Facebook Ads were targeted such that they appeared on desktop devices and appeared on the Facebook desktop news feed and on desktop right column randomly.

The designated market area was violent and nonviolent States selected based on the Mexico Peace Index 2015 calculated by the Institute for Economics & Peace (This index is based on 7 key aspects: homicides, violent crime, weapons crime, incarceration, police funding, organized crime and justice efficiency ( see Figure 9.) )The Ads were shown on Facebook pages of Mexicans aged 18 to 60 years old who stated that they live in some city in Mexico. The optimization and delivery method selected was the cost-per-click (CPC) payment method. This option allows a buyer to pay only when users click on the ads whereas in the cost-per-thousand-impressions model cost is based on the number of times (in thousands) that the ad appears on user's screen. The ads in CPC model entering in an auction where the buyer can choose a bid on what link clicks are worth for the buyer; in this case the model selected was an automatic bid were Facebook set automatically the bid to get most clicks at the lowest price. The delivery method selected was standard, which means that the ads were shown throughout the day. Cornell University, Institutional Review Board for Human Participants approved the procedure (Protocol ID#: 1511005970). The study was coded with the technical support of the University of Southern California by using NubiS, which is a complete data collection tool that has been developed by the team behind the Understanding America Study (UAS) panel at the Center for Economic and Social Research and it was hosted by the same research center. The experiment was coded in English and Spanish language. We used the Spanish version, a set of the experiment screens is included in the appendix.

The Facebook Ads ran from Jun 7 to August 30, 2016. According to data provided by the Facebook self-service ads management application, the ads were shown a total of 1,429,265 times to 115,743 Facebook users over the 14-weeks campaign for a mean of 12.35 impressions per unique user. The ads received 4,321 clicks by 3,135 unique users for a total click-through rate of 0.30% at a mean cost of \$0.08 per click. The success of the ads, was measured by clicks and click-through rate, varied substantially depending on the ad image, the total cost of the Facebook Ads was \$464.26. The sample considered is about (N= 111, Table 1) Internet survey respondents-demographic diverse ( albeit no representative) sample of the Mexican adult population.

### **3.5 Proposed Model: Nonparametric Factorial**

This section proposes to follow a nonparametric approach in factorial designs. In a one-way layout, nonparametric assume:  $Y$  denote the matrix of observations on the left-hand side variables. Let  $X$  denote the design matrix based on the right-hand side variables. The last column of  $X$  is equal to all ones, and it may include categorical right-hand side variables. Columns of  $X$  corresponding to interactions are formed by multiplying the various combinations of the variables involved in the interaction.

$$Y = X\beta + \epsilon \tag{3.5.0.1}$$

leads to the following hypotheses:

$$C\beta A' = 0 \quad (3.5.0.2)$$

where  $\beta$  is a matrix of parameters,  $C$  specifies constraints on the design matrix  $X$  for a particular hypothesis, and  $A$  provides transformation of  $Y$ .  $A$  is the identity matrix. An estimate of  $\beta$  is given by:

$$\beta = (X'X)^{-1}X'Y \quad (3.5.0.3)$$

The error sum of squares and cross products matrix is:

$$E = A(Y'Y - B'X'XB)A' \quad (3.5.0.4)$$

and the cross product matrix for the hypothesis is:

$$H = A(CB)' \{C(X'X)^{-1}C'\} (CB)A' \quad (3.5.0.5)$$

Let  $\lambda_1 > \lambda_2 > \dots > \lambda_s$  represent the nonzero eigenvalues of  $E^{-1}H$ ,  $s = \min(p, \nu_h)$ , where  $p$  is the number of columns of  $YA'$  (that is, the number of  $y$  variables or number of resultant transformed left-hand-side variables), and  $\nu_h$  is the hypothesis of freedom. Wilks' (1932) lambda statistic is:

$$\Lambda = \prod_{i=1}^s \frac{1}{1 + \lambda_i} = \frac{|E|}{|H + E|} \quad (3.5.0.6)$$

and is a likelihood test. This statistic is distributed as the Wilks'  $\Lambda$  distribution if  $E$  has the Wishart distribution,  $H$  has the Wishart distribution under the null hypothesis, and  $E$  and  $H$  are independent. The null hypothesis is rejected for small value of  $\Lambda$ . Let  $p$  be the number of columns of  $YA'$  ( the number of  $y$  variables of

the number of resultant transformed  $y$  variables),  $\nu_h$  be the hypothesis degrees of freedom,  $\nu_e$  be the error degrees of freedom,  $s = \min(\nu_h, p)$ ,  $m = (\nu_h - p + 1) - 1)/2$ , and  $n = (\nu_e - p - 1)/2$ . Transformations of this multivariate statistics to  $F$  statistics is as follows: we will use Wilks' lambda, an approximate  $F$  statistic (Rao 1951) with  $df_1$  and  $df_2$  degrees of freedom is:

$$F = \frac{(1 - \Lambda^{1/t})df_2}{(\Lambda^{1/t})df_1} \quad (3.5.0.7)$$

where

$$\begin{aligned} df_1 &= p\nu_h, df_2 = wt + 1 - p\nu_h/2 \\ w &= \nu_e + \nu_h - (p + \nu_h + 1)/2 \\ t &= \left( \frac{p^2\nu_h^2 - 4}{p^2 + \nu_h^2 - 5} \right)^{1/2} \end{aligned} \quad (3.5.0.8)$$

Consistent with this model, there are many situations where the treatments represent the combinations (at two or more levels) of two or more factors, so that we may not only be interested in their main effects but also in their possible interactions. In theory, such interaction effects and main effects all can be handled by suitable (linear) transformations on the original response variables and similar test statistics can be used to test for a plausible null hypothesis of no interaction or no main effects. Moreover, for testing the null hypothesis of no interaction, it may be more reasonable to assume that the main effects of the various factors may not have insignificant differences so that they should be treated as nuisance parameters. There are some serious theoretical deficiencies of such procedures in a general multi-factor experiment. The formulation of null and alternative hypotheses requires a much more restricted setup for such rank transformed data

sets. This paper will not emphasize on such rank transformations, however, it propose to follow a procedure in a factorial analysis, we are borrowing the procedure of Kumar Sen(1995), discussed also in Mehra, K.L. and Sen, P.K. (1969). The case of this paper is related to three treatment experiment with observations for each individual:

Kumar Sen(1995) state this problem by setting  $Y_{ijk}$  as the response variate for a treatment condition  $(i,j,k)$  and assume that the following fixed-effects factorial model holds:

$$Y_{ijk} = \mu_i + \nu_j + \tau_k + \gamma_{jk} + \epsilon_{ijk} \quad (3.5.0.9)$$

where  $\mu_i$   $i=1,\dots,n$ ;  $j=1,\dots,p$ ;  $k=1,\dots,q$ ; with  $n \geq 2$ ,  $p \geq 2$ ,  $q \geq 2$ . Here  $\mu_i$  represents the block effect,  $\nu_j$  and  $\tau_k$  represent the main effects for the two factors and  $\gamma_{jk}$ , represent the interaction of the two factors and  $\epsilon_{ijk}$  are the residual error components. We may set without any loss of generality:

$$\sum_{j=1}^p \mu_i = 0, \sum_{j=1}^p \nu_j = 0, \sum_{k=1}^q \tau_k = 0 \quad (3.5.0.10)$$

$$\gamma_j = q^{-1} \sum_{k=1}^q \gamma_{jk} = 0, j = 1, \dots, p \quad (3.5.0.11)$$

$$\gamma_k = p^{-1} \sum_{j=1}^p \gamma_{jk} = 0, j = 1, \dots, q \quad (3.5.0.12)$$

Kumar Sen(1995) state that assume that for each  $i$   $\epsilon_{i11}, \dots, \epsilon_{ipq}$  have a joint d.f.  $G$

which is a symmetric function of its  $pq$  arguments. and these  $n$  ( $pq$ -) vectors are independent. This includes the conventional assumption of i.i.d structure of the  $\epsilon_{ijk}$  as a particular case, and more generally, it allows each error vector to have interchangeable components which may still be dependent, in this case the effects would be possible stochastic and we would have a mixed effects factorial model, on which the null hypothesis of interest is:

$$H_0 : \Gamma = ((\gamma_{jk})) = 0 \quad (3.5.0.13)$$

against alternative  $\Gamma$  is non-null. To formulate suitable aligned rank test for this hypothesis testing problem. Let for an  $m(\geq 1)$ , let  $\mathbf{1}_m = (1, \dots, 1)'$  and consider the following intra-block transformations which eliminates the main effects. Let  $Y_i = ((Y_{ijk}))_{p \times q}$ ,  $\Gamma_i$  be the corresponding matrix for the error components and let:

$$\mathbf{Z}_i = (\mathbf{I}_p - p^{-1}\mathbf{1}_p\mathbf{1}_p')\mathbf{Y}_i(\mathbf{I}_p - p^{-1}\mathbf{1}_p\mathbf{1}_p'), \quad i = 1, \dots, n \quad (3.5.0.14)$$

$$\mathbf{E}_i = (\mathbf{I}_p - p^{-1}\mathbf{1}_p\mathbf{1}_p')\mathbf{\Omega}_i(\mathbf{I}_p - p^{-1}\mathbf{1}_p\mathbf{1}_p'), \quad i = 1, \dots, n \quad (3.5.0.15)$$

Then from (6.0.4),(6.0.6) and (6.0.7) we have:

$$\mathbf{Z}_i = \Gamma + \mathbf{E}_i, \quad i = 1, \dots, n \quad (3.5.0.16)$$

Following Kumar Sen(1995) on this transformed model, the nuisance parameters are eliminated. Here we are assuming interchangeability condition on the

intra-block error components implies that for each  $i(=1, \dots, n)$  of  $E_i$  remains interchangeable. This condition provides access to use permutationally distribution-free procedures on the stochastic matrices  $Z_i, i=1, \dots, n$ . On the other hand,  $E_i$  satisfy the same restraints in 6.0.11 and 6.0.12, so that are effectively only  $(p-1)(q-1)$  linearly independent components among the  $pq$ . Kumar Sen(1995) state that if we assumed interchangeability of the elements of  $\Gamma_i$  that the joint distribution of  $E_i$  remains invariant under possible  $p!$  permutations of its columns and also any  $q!$  permutations of its rows. There is a finite group  $G$  of  $(p!q!)$  permutations which maps the sample space of  $E_i$  onto itself and leaves the joint distribution invariant. By working with the  $n$  independent aligned error matrices, we arrive at  $G$  of transformations having  $(p!q!)^n$  allowing access to the exact permutation distribution of suitable test statistic. If we assume intra-block rankings of these observations and obtain a robust test, let  $R_{ijk}$  be the 1rank of the  $Z_{ijk}$  among the  $N = npq$  observations,  $Z_{s,u,v}, s = 1, \dots, n, u = 1, \dots, p$  and  $v = 1, \dots, q$ . Let define the scores  $a_N(r), r = 1, \dots, N$ , for simplicity let  $\eta_{ijk} = a_N(R_{ijk}), i = 1, \dots, n, j = 1, \dots, p, k = 1, \dots, q$  and let:

$$\eta_{ij} = q^{-1} \sum_{k=1}^q \eta_{ijk}, j = 1, \dots, p \quad (3.5.0.17)$$

$$\eta_{ik} = q^{-1} \sum_{j=1}^q \eta_{ijk}, k = 1, \dots, p \quad (3.5.0.18)$$

$$\eta_i = (pq)^{-1} \sum_{j=1}^p \sum_{k=1}^q \eta_{ijk} \quad (3.5.0.19)$$

for  $i=1, \dots, n$  and let  $\eta = n^{-1} \sum_{i=1}^n \eta_i$ . Define the aligned rank statistic as:

$$\mathbf{L}_{N,j,k} = n^{-1} \sum_{i=1}^n \eta_{i,j,k}; \mathbf{L}_N = ((L_{N,j,k})) \quad (3.5.0.20)$$

Then the rank-adjusted statistics in Kumar Sen(1995) are define by:

$$L_N^* = (\mathbf{I}_p - p^{-1}\mathbf{1}_p\mathbf{1}_p')\mathbf{L}_N(\mathbf{I}_p - p^{-1}\mathbf{1}_p\mathbf{1}_p'), = ((L_{N,j,k})) \quad (3.5.0.21)$$

The rank of measure of dispersion is defined by:

$$V_n = [n(p-1)(q-1)]^{-1} \sum_{i=1}^n \sum_{j=1}^p \sum_{k=1}^q (\eta_{i,jk} - \eta_{ij} - \eta_{ik} + \eta_{i\dots})^2 \quad (3.5.0.22)$$

In Kumar Sen(1995) and Mehra, K.L. and Sen, P.K. (1969) considers the following test statistics:

$$\mathcal{L}_N^* = [n/V_N] \sum_{j=1}^p \sum_{k=1}^q \{L_{N,jk}^*\}^2 \quad (3.5.0.23)$$

which is analogous to the classical parametric test statistics based on the variance ratio criterion..

### 3.5.1 Nomparametric: Perception of Risk & Emotion Condition Estimates

The evaluation of risk considers 26 judgments over three scales. The Risk of future events of Drug War violence & Corruption scenarios in Mexico was a four-item Likert-type scale with six scenarios of risk. The other two measures focus on if the respondent and an average citizen might experience a risk event. The judgment on these events was measured on a four-item Liker scale with ten judgments of risk each one. The three emotion conditions (Angry/Sad/Afraid) were evaluated with a manipulation check by asking the respondents to write their self-reported emotion relate to drug war violence. The responses were range from (1- not feel the emotion condition, 2- feel slightly, 3- somewhat feel, 4- feel the emotion very

and 5-extremely feel the emotion). To distinguish the effects between these three cases we estimate the marginal effects between risk and emotion condition. For this aim, we use a parametric estimation, in theory, if we assume that  $\theta$  is a vector of parameters in a model,  $z$  a vector of covariates values and  $f(z, \theta)$  be a scalar value function returning the prediction of interest. Margins compute estimates of

$$p(\theta) = \frac{1}{M_{S_p}} \sum_{j=1}^M \delta_j(S_p) f(z_j, \theta) \quad (3.5.0.24)$$

where  $\delta_j(S_p)$  identifies elements within the population  $S_p$

$$\delta_j = \begin{cases} 1, & j \in S_p \\ 0, & j \notin S_p \end{cases} \quad (3.5.0.25)$$

$M_{S_p}$  is the subpopulation size, and  $M$  is the population size. Let  $\hat{\theta}$  be the vector of parameter estimates. The margins estimates  $p(\theta)$  via:

$$\hat{p} = \frac{1}{w} \sum_{j=1}^N \delta_j(S_p) w_j f(z_j, \hat{\theta}) \quad (3.5.0.26)$$

where:

$$w = \sum_{j=1}^N \delta_j(S_p) w_j \quad (3.5.0.27)$$

$\delta_j(S_p)$  indicates whether the observation  $j$  is in population  $S_p$ ,  $w_j$  is the weight for the  $j$ th observation and  $N$  the sample size. We estimate a parametric model

$$RiskScales_i = \mu + \beta Ec_j + \epsilon_{ij} \quad (3.5.0.28)$$

$RiskScales_i$  is the risk scales as dependent measure,  $Ec_j$  is the treatment emotion condition (anger,sad, afraid), and  $\epsilon_{ij}$  is the residual error and we estimated the marginal effects of each pairwise comparison of risk and treatment. In addition, to test our hypothesis, a nonparametric factorial analysis was estimated whether if for controlling for respondents' self-reported emotions it would diminish the relationship between emotion condition and risk perception. The model considered is:

$$RiskScales_i = \beta Ec_j + \phi Ewar_l + \psi_{jl} + \epsilon_{ijl} \quad (3.5.0.29)$$

Here,  $RiskScales_i$  include the three risk scales as dependent measures,  $Ec_j$  is the treatment emotion condition (anger,sad, afraid) as the independent variable represented by  $\beta$ ,  $Ewar_l$  is the self-reported emotion related with drug war and is represented by the parameter  $\phi$ . The interaction effects are given by  $\psi_{jl}$  represents the interaction between the treatment emotion condition an emotion related to war and are the  $\epsilon_{ijl}$  the residual error components.

We start our analysis with the evaluation of risk for future events, Tables C.2 and C.3 on the Appendix of chapter 3 shows the results before and after the treatment. From Table C.3 we can observe that respondents under the anger condition

show more anger than respondents under the sad condition. Table C.4 report the pairwise comparisons of adjusted predictions between the three emotion conditions and the risk estimates for future events. There are not significant differences associated with the conditions and the six levels of risk. Table 5 reports the nonparametric analysis for the perception of risk of future events of Drug War violence and corruption in Mexico [judgments related with insecurity, drug war violence, corruption, the state of law]. The table show opposite effects on risk perception for fear, anger and afraid. The general results show effects with significant associations in the interaction of the treatment and the self-reported emotion. We expect that anger will evoke lower risk perception  $F(12, 60.0) = 1.19$ , Wilks'  $\lambda=0.6522$ , afraid and high risk perception,  $F(12, 56.0) = 0.53$ , Wilks'  $\lambda=0.8063$ , and sad and higher risk perception  $F(12, 52.0) = 1.18$ , Wilk's  $\lambda=0.6181$ , [see Table C.4]. However, Figure C.2 shows the means of risk perception by emotion condition, in some cases, the effect is more smooth, this can be attributed to the treatment emotion and the subjective evaluation of risk by the respondents. The judgments for future events of drug violence are more attenuated for the anger condition on which respondents perceived that a drug war violent event will likely occur withing the next 12 months and less likely that the Mexican Government 's strategy of drug war will defeat DTOs. Respondents under the sad condition are expected to have pessimistic estimates, the effect is more attenuated when respondents evaluated that is unlikely that the Mexican government's strategy against DTO's will improve their safety and less likely that the Mexican government will improve withing the next 6 years.

The second risk scale evaluated people's judgments if they might experience events related with drug violence [ i.e shootings, kidnapping, smuggling, robbery]. Table C.6 reports the pairwise comparisons of adjusted predictions between the three emotion conditions and the risk estimates for future events and there are not significant differences between the groups. Table C.7 reports the results of the nonparametric analysis and it shows a significant association in the interaction of the treatment and the self-reported emotion. Our theory suggest that sad may be associated with high risk perception  $F(20, 44)=1.14$ , Wilks'  $\lambda=0.4330$  , afraid and higher risk perception  $F(20, 48.0)=0.91$ , Wilks'  $\lambda=0.5251$  and anger and lower risk perception  $F(20, 52.0)=0.58$ , Wilks'  $\lambda=0.6675$ . Figure C.3 shows the means of risk perception for future events for self. With regard the perception for risky events for an average Mexican, we can observe that under the anger condition respondents perceive likely to be a victim of shootings, murder, kidnapping. Respondents under the sad condition judge that more likely that they might be experienced the presence of DTOs in their neighborhood, experience corruption and extortion.

Turning to Table C.8, it reports the pairwise comparisons of adjusted predictions between the three emotion conditions and the risk estimate for an average Mexican and it shows not significant differences between the groups. The non-parametric analysis in Table C.9 shows a significant association in the interaction between emotion condition and self-reported emotion, sad and higher risk perception  $F(20, 44.0)=1.01$ , Wilks'  $\lambda=0.4683$ , as well as between the anger and lower

risk perception  $F(20, 52.0)=0.57$ , Wilks'  $\lambda=0.6711$ . Figures C.4 shows the means of risk perception by emotion condition for an average Mexican, it is possible that placing a greater analytic demand on respondents might diminish emotion effects, in some risk evaluation the mean of risk perception are similar and it may reflect aspects of the manipulation other than the emotion evoked. Respondents under the anger condition consider that is more likely that an average Mexican will experience murder and extortion, respondents under the sad condition considers that an average Mexican will be more likely to see the presence of DTO's, corruption, narcobloqueos and narcomantas. In general terms, these findings may suggest that respondents may saw themselves a less vulnerable to risk than the average and less likely to take precautionary measures.

The foregoing results of policy preferences in Table C.10 reports the pairwise comparisons of adjusted predictions between the three emotion conditions with not significant differences between the groups. Table C.11 reports the nonparametric analysis and it shows a significant association in the interaction of the treatment and the self-reported emotion. The causal effects on risk judgments sad and high risk perception  $F(8, 56.0)=1.27$ , Wilks'  $\lambda=0.7159$ , afraid and high risk perception  $F(8, 60.0)=1.44$ , Wilks'  $\lambda=0.7036$  and between anger and lower risk perception  $F(8, 64.0)=0.76$ , Wilks'  $\lambda=0.8331$ . Figure C.5 shows the means of policy preferences by emotion condition; the comparison between anger and fear based on risk estimates, experimentally primed anger activate more reserved policy preferences and sad with slightly favor drug violence policies.

### 3.5.2 Nonparametric: Victim Effect and Pro-social Behavior Estimates

To test our hypothesis 2, we use the following specification by controlling for respondent's victim effect treatment, emotion condition and self reported emotion about Drug War:

$$Allocation_i = \beta Ec_j + \mu Ident_k + \phi Ewar_l + \gamma_{jk} + \psi_{jl} + \vartheta_{kl} + \varphi_{jkl} + \epsilon_{jkl} \text{ for all } j \neq k \neq l \quad (3.5.0.30)$$

$Allocation_i$  represents the contribution as a dependent measure,  $Ident_k$  is the identification, it represents the victim effect treatment represented by  $\mu$ , as before  $Ewar_l$ , is the self-reported emotion related with drug war represented by  $\phi$  and the treatment emotion condition  $Ec_j$  by  $\beta$ . The parameters  $\psi_{jl}$  represents the interaction between emotion condition and the self-emotion related with Drug War. The interaction between identification and emotion condition is represented by  $\gamma_{jk}$ , the interaction between identification and drug war emotion is represented by  $\vartheta_{kl}$ , finally, the interaction between the three variables is represented by  $\varphi_{jkl}$ , residual errors are represented by  $\epsilon_{jkl}$ .

The results in Table C.11 shows that identification has an effect impact on allocation  $F(18.0, 92.0)=0.99$ , Wilk's  $\lambda=0.8383$ , the mixed effect between self-reported emotion and identification has a high impact on allocation  $F(3.0, 92.0)=1.32$ , Wilk's  $\lambda=0.9206$  From Table C.12, donations was larger in the determine condition ("has been selected" ) than in the undetermined condition ("will be selected"). The emo-

tion condition has a particular effect on donation marking striking differences between people on the "angry" and "afraid" condition. Respondents given the "sad" condition are less willing to donate which is explained by group sizes and the assignation of identification treatments by emotion condition. Consistent with the effect of emotion condition and allocation, the analysis per amount of contribution suggest that when the victim has been determined there exist a victim effect with more contributions on the \$10 dollars donation option, on a \$5 dollars the effect is attenuated, on a \$0 dollar option the effect is bigger on the undetermined condition. In general terms, this reflects that (1) exists a statistically significant relationship with the contribution, identification and the feel about the Drug War, (2) exist a weak form of identifiability on contribution.

### **3.6 Conclusions**

By using an online experiment on Facebook, and nonparametric factorial analysis, we found evidence that explains the behavior of individuals follows for some evaluations of risk events the appraisal tendency theory framed on three emotion treatments anger, sad and afraid. Risk estimates differ between respondents and judgments. By controlling for anger, sad and afraid conditions we found that anger trigger more optimistic estimates, sad and afraid condition showed the opposite effect with pessimist estimates. The effects were analyzed by setting a multivariate analysis whether controlling for respondent self-reported emotion

would diminish the relation between emotion condition and risk perception. Because respondents estimate the chance that each event would occur is possible that the condition differences reflects (1) aspects of the manipulation other than the emotion evoked (2) contextual factors and institutional environment which make more difficult separate the effects [ see Figures C.2-C.5 ]. In particular, the risk of future events of drug violence & corruption in Mexico shows that respondents are more likely aware of experienced extortion, shootings, narcobloqueos, narcomantas or see the presence of DTOs in their neighborhood

Respondents under the sad emotion condition judge kidnapping and murder their neighborhood with low-risk perception. Angry and Afraid conditions turn the judge estimates to narcobloqueos, narcomantas, shootings and see the presence of DTOs in their neighborhood with high-risk perception. In the three emotional condition corruption was the common event that might be experienced by respondents. At the same time, these respondents judge that an average Mexican is more likely to experience murders, extortion, shooting, narcobloqueos and drug trafficking. In addition, respondents judge that an average Mexican might experience the same level of violence as they do. Although our comparisons between anger, sad and afraid focus on risk estimates, emotions also influenced public policy preferences. Anger-condition respondents support slightly partial legalization of recreational drugs. Respondents under the sad -condition are more neutral towards a policy that considers gun legalization and somewhat opposed to gun legalization. They are more neutral towards a death penalty policy.

In combination with the pro-social behavior of respondents, we use a weak form that supports the existence of an identifiable victim effect. Similar to Small & Loewenstein (2003), the weak form of determination manipulation, shows that the effect is not due to specific information that respondents receive about victims; reference groups size may be a contributing factor even when one holds the reference group size constant, there remains an effect of identifiability. The fact that “someone experiences” or witnesses an act of violence” does not mean that he or she “will inevitably develop psychiatric morbidity” [Leva (2006), Carrant & Miller(2001)]. However, the results of this research contributes to the literature that explains pro-social behavior interplay emotions and risk perceptions (Holtgrave & Weber 1993; Loewenstein, Weber, Hsee, & Welch 2001; Mellers, Schwartz, & Ritov 1999; Schwarz & Clore 1996; Slovic, Finucane, Peters, & MacGregor,2002]. There is not victim effect under the sad condition for respondents living in violent and nonviolent places. The anger and afraid emotional condition show a victim effect more pronounced on respondents living in nonviolent locations.

These results suggest that people’s emotions towards the Drug War violence and the identification of a victim effect are framed on a heterogeneous set of aspects [Weiner (1980, 1995), Small & Loewenstein (2003)]. Our general results suggest that respondents under the anger treatment emotion increases the inclination to help this person (the sad condition triggers pessimistic judges on risk and the self-reported emotion helpless about Drug War). Finally, future work might analyze people reactions on social media and the relation with people’s digital well-being. De Choudhury (2014), Christakis (2016) and our results suggest that

future empirically motivated questions should be around network effects of affective responses, desensitization by violence. Emotion contagion and individual attributes (e.g personality, gender, age), social influence, polarization and well-being between and withing peers on this networks could generalize to analyze other violence-related crisis and provide elements to use social media and data science to guide public polices.

APPENDIX A

CHAPTER 1 OF APPENDIX

Table A.1: Respondent Demographic Characteristic

		Completed (N=259)	Residents Non-Violent Locations (N=95)	Residents Violent Locations (N=164)
Gender	Male	40.93	34	43.90
	Female	59.07	61	56.10
Marital Status	Single	59.46	60.0	59.15
	Married	25.87	26.32	25.61
	Non Married Couple	8.88	8.42	9.15
	Separate	1.54	1.05	1.83
	Divorce	4.25	4.21	4.27
	Widowed	0.0	0.0	0.0
Education Level	None	0.0	0.0	0.0
	Incomplete Elementary School	0.77	0.0	1.22
	Complete Elementary School	0.39	0.0	0.61
	Incomplete Middle School	0.77	0.0	1.22
	Complete Middle School	1.16	0.0	1.83
	Incomplete High School	1.54	2.11	1.22
	Complete High School	8.49	14.74	4.88
	Some College	13.90	20.0	10.37
	Bachelors Degree	25.10	16.79	28.66
Graduate Degree	47.88	44.21	50.0	
Age	Less 18	0.39	0.0	0.61
	18-19	7.72	13.68	4.27
	20-24	16.99	24.21	12.80
	25-29	13.51	10.53	15.24
	30-34	17.76	8.42	23.17
	35-39	12.36	11.58	12.80
	40-44	8.49	11.58	6.71
	45-49	5.79	5.26	6.10
	50-54	8.11	7.37	8.54
	55-59	6.18	4.21	7.32
60+	2.70	3.16	2.44	
Household Size	1	12.74	10.53	14.02
	2	21.62	16.84	24.39
	3	24.71	24.21	25.0
	4 and above	40.93	48.42	35.59
Employment Status	Employed	59.07	48.42	65.24

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Table A.1 – Continued from previous page

	Completed	Non-Violent	Violent
Unemployed	10.59	9.47	11.59
Not in labor Force	29.51	42.11	23.17

*Note: All numbers are percentages, the table report only respondents who complete the survey.*

Table A.2: Personal and Policy Scenarios-Marginal Utility Estimates

Aspect	Rank	Personal		Coefficient	Policy	
		Coefficient	SE		SE	Rank
Your ability to dream and pursue your dreams	1	0.338	(0.087)	0.197	(0.205)	20
Your ability to be yourself and express yourself	2	0.288	(0.073)	-0.001	(0.123)	97
You having a role to play in society	3	0.284	(0.048)	0.103	(0.137)	44
Your success at accomplishing your goals	4	0.2841	(0.09)	0.244	(0.190)	17
You are having many options and possibilities in your life and the freedom to choose among them	5	0.257	(0.112)	-0.112	(0.238)	127
Your ability to fully experience the entire range of healthy human emotions	6	0.248	(0.089)	0.177	(0.174)	25
You feeling that you have enough time and money for the things that are most important to you	7	0.238	(0.087)	0.060	(0.178)	66
The overall well-being of you and your family	8	0.2324	(0.097)	-0.191	(0.257)	136
Your neighborhood is safe ( i.e no thieves, extortion, smuggling, kidnapping or murders)	9	0.231	(0.092)	0.099	(0.155)	46
Your absence of internal conflict (conflict within yourself)	10	0.225	(0.071)	0.331	(0.145)	7
Your home is free of addictions	11	0.220	(0.099)	-0.107	(0.152)	126
The absence of humiliation and embarrassment in your life	12	0.218	(0.08)	0.138	(0.155)	33
How often you become deeply engaged in your daily activities	13	0.212	(0.077)	0.047	(0.156)	73
How much you appreciate your life	14	0.203	(0.103)	0.357	(0.21)	6
Your personal growth	15	0.198	(0.079)	0.0269	(0.138)	81
How often you are able to challenge your mind in a productive or enjoyable way	16	0.198	(0.075)	0.037	(0.128)	74
Your feeling of independence and self-sufficiency	17	0.192	(0.096)	0.066	(0.115)	64
The quality of your sleep	18	0.190	(0.10)	0.091	(0.176)	54
Your health	19	0.1883	(0.092)	-0.090	(0.232)	123
The absence of stress in your life	20	0.187	(0.085)	0.082	(0.157)	58
Your sense of connection with the universe or the power behind the universe	21	0.186	0.07	-0.264	(0.168)	139

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Table A.2 – Continued from previous page

Aspect	Rank	Personal		Policy		Rank
		Coefficient	SE	Coefficient	SE	
The overall quality of your experience at work	22	0.1814	(0.030)	-0.040	(0.170)	110
Your knowledge, skills, and access to information	23	0.0.17	(0.08)	-0.215	(0.167)	137
Your sense that everything happens for a reason	24	0.170	(0.07)	0.068	(0.160)	63
The happiness of your family	25	0.166	(0.105)	0.105	(0.141)	43
You having the people around you think well of you and treat you with dignity and respect	26	0.165	(0.085)	0.129	(0.150)	36
Your physical safety and security	27	0.165	(0.085)	0.061	(0.122)	65
How interesting, fascinating, and free of boredom your life is	28	0.159	(0.088)	-0.085	(0.220)	120
Your sense of purpose	29	0.159	(0.087)	-0.083	(0.128)	119
Your sense that you are standing up for what you believe in	30	0.155	(0.08)	-0.029	(0.145)	103
The absence of anger in your life	31	0.154	(0.107)	0.285	(0.056)	10
Your sense of discovery and wonder	32	0.154	(0.076)	0.158	(0.138)	29
How much love there is in your life	33	0.148	(0.100)	0.153	(0.120)	32
You feeling that you are understood	34	0.146	(0.088)	-0.032	(0.139)	104
The absence of regret you feel about your life	35	0.146	(0.083)	-0.079	(0.216)	118
Your freedom from emotional abuse or harassment	36	0.144	(0.088)	0.051	(0.116)	70
You having people around you who share your values, beliefs and interests	37	0.141	(0.09)	0.095	(0.109)	50
How often you smile or laugh	38	0.139	(0.098)	-0.183	(0.171)	134
Your sense that you are making a difference, actively contributing to the well-being of other people	39	0.137	(0.102)	0.098	(0.154)	47
The extent to which you feel the things you do in your life are worthwhile	40	0.133	(0.075)	0.023	(0.09)	83
You feeling alive and full of energy	41	0.132	0.037	-0.08	(0.147)	121
Your ability to shape and influence the things around you	42	0.130	(0.069)	0.023	(0.026)	83
Your sense that you are competent and capable in the activities that matter to you	43	0.129	(0.079)	0.032	(0.162)	78

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Table A.2 – Continued from previous page

Aspect	Rank	Personal Coefficient	SE	Coefficient	Policy SE	Rank
You having many moments in your life when you feel inspired	44	0.123	(0.126)	0.90	(0.130)	55
Your ability to keep good perspective in your life	45	0.122	(0.085)	-0.032	(0.209)	105
The happiness of your friends	46	0.120	(0.091)			
How glad you are to have the life you have rather than a different life	47	0.114	(0.089)	0.155	(0.179)	30
The extent to which you 'have a good life'	48	0.113	(0.090)	0.050	(0.121)	71
How fulfilling your life is	49	0.105	(0.109)	-0.265	(0.316)	140
You feeling that you understand the world and the things going on around you	50	0.104	(0.083)	0.095	(0.120)	49
How peaceful, calm, and harmonious your life is	51	0.144	(0.034)	0.158	(0.151)	27
How much you enjoy your life	52	0.102	(0.115)	0.367	(0.127)	4
You not feeling anxious	53	0.099	(0.09)	0.271	(0.148)	12
Your social status	54	0.088	(0.076)			
Your enjoyment of winning, competing, and facing challenges	55	0.087	(0.087)	0.021	(0.146)	85
How much beauty you experience in your life	56	0.097	(0.040)	-0.090	(0.137)	122
Your sense that your life is meaningful and has value	57	0.081	(0.108)	-0.182	(0.233)	133
You feeling that you are part of something bigger than yourself	58	0.021	(0.043)	0.219	(0.127)	19
You feeling that your life has direction	59	0.079	(0.072)	-0.037	(0.142)	108
Your home is free of domestic violence	60	0.078	(0.088)	-0.142	(0.174)	130
Your sense that things are getting better and better	61	0.077	(0.097)	0.025	(0.133)	82
Your pride and respect for yourself	62	0.077	(0.08)	0.312	(0.13)	8
Your sense of achievement and excellence	63	0.076	(0.096)	-0.27	(0.189)	141
How high your income is compared to the income of other people around you	64	0.075	(0.10)			
Your ability to 'be in the moment'	65	0.071	(0.096)	0.015	(0.201)	90
The amount of pleasure in your life	66	0.068	(0.074)	0.088	(0.124)	56

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Table A.2 – Continued from previous page

Aspect	Rank	Personal Coefficient	SE	Coefficient	Policy SE	Rank
Your sense of community, belonging, and connection with other people	67	0.064	(0.100)	0.117	(0.125)	38
Your rating of your life on a ladder where the lowest rung is 'worst possible life for you' and the highest rung is 'best possible life for you'	68	0.061	(0.08)	0.069	(0.120)	62
You having a beautiful life story, or a life that is 'like a work of art'	69	0.060	(0.086)	0.018	(0.150)	89
How rewarding the activities in your life are	70	0.058	(0.09)	0.179	(0.180)	24
How much of the time you feel happy	71	0.058	(0.134)	0.181	(0.133)	23
Your sense that you know what to do when you face choices in your life	72	0.052	(0.109)	0.406	(0.143)	3
Your opportunities to participate in ceremonies, cultural events, and celebration	73	0.047	(0.104)	-0.303	(0.148)	142
Your ability to have and raise children	74	0.045	(0.08)	-0.313	(183)	144
The absence of frustration in your life	75	0.058	(0.036)	0.040	(0.181)	2
You being a good, moral person and living according to your personal values	76	0.042	(0.09)	0.216	(0.135)	20
You having new things, adventure, and excitement in your life	77	0.042	(0.071)	-0.037	(0.147)	109
The quality of your romantic relationships, marriage, love life or sex life	78	0.040	(0.103)	0.245	(0.157)	15
Your sense of optimism about your future	79	0.039	(0.08)	0.113	(0.127)	41
Your material standard of living	80	0.037	(0.077)	0.028	(0.137)	80
Your physical comfort	81	0.034	(0.093)	0.153	(0.213)	31
Your ability to fulfill your potential	82	0.032	(0.08)	0.093	(0.185)	51
How easy and free of annoyances your life is	83	0.031	(0.098)	-0.105	(0.188)	125
How happy you feel	84	0.030	(0.081)	0.036	(0.135)	75
How much you like your life	85	0.025	(0.073)	-0.043	(0.116)	111
How satisfied you are with your life	86	0.023	(0.092)	-0.036	(0.166)	106
Your mental health and emotional stability	87	0.0213	(0.093)	0.096	(0.121)	48
The amount of fun and play in your life	88	0.015	(0.092)	-0.145	(0.133)	131
In your neighborhood there is not presence of drug trafficking organizations	89	0.0140	(0.073)	0.245	(0.149)	14

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Table A.2 – Continued from previous page

Aspect	Rank	Personal		Policy		
		Coefficient	SE	Coefficient	SE	Rank
Your power over other people	90	0.012	(0.079)	(1.38)		
You having others remember you and your accomplishments long after your death	91	0.011	(0.099)			
You feeling that things are going well for you	92	-0.002	(0.078)	-0.191	(0.153)	135
You not being lonely	93	-0.004	(0.08)	0.093	(0.103)	52
The absence of sadness in your life	94	-0.008	(0.093)	-0.037	(0.154)	107
You feel safe in your neighborhood	95	-0.010	(0.09)	0.283	(0.15)	11
Your neighborhood is free of drug trafficking	96	-0.010	(0.09)	0.365	(0.205)	5
Your chance to live a long life	97	-0.013	(0.010)	0.035	(0.098)	76
How full of beautiful memories your life is	98	-0.016	(0.100)	-0.125	0.150	128
Your financial security	99	-0.016	(0.085)	0.177	(0.174)	26
The absence of shame and guilt in your life	100	-0.020	(0.072)	0.305	(0.163)	9
How close your life is to being ideal	101	-0.021	(0.096)	-0.159	(0.137)	132
The amount of order and stability in your life	102	-0.02	(0.074)	0.245	(0.123)	13
You getting the things you want out of life	103	-0.031	(0.085)	0.059	(0.178)	67
Your neighborhood is free of drug violence	104	-0.03	(0.08)	0.131	(0.194)	34
The absence of worry in your life	105	-0.044	(0.086)	-0.050	(0.136)	113
Your sense of security about life and the future in general	106	-0.047	(0.079)	-0.073	(0.182)	115
You having people you can turn to in time of need	107	-0.059	(0.088)	0.092	(0.120)	53
The quality of your family relationships	108	0.0174	(0.037)	-0.001	(0.04)	98
Your passion and enthusiasm about things in your life	109	-0.688	(0.092)	-0.063	(0.139)	114
Your freedom from pain	110	-0.087	(0.09)	0.070	(0.118)	61
You not feeling depressed	111	-0.090	(0.078)	-0.077	(0.119)	117
The absence of fear in your life	112	-0.101	(0.085)	0.032	(0.162)	77
You feeling that you have been fortunate in your life	113	-0.102	(0.084)	0.192	(0.150)	22
How desirable your life is	114	-0.128	(0.09)	0.028	(0.138)	79

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Table A.2 – Continued from previous page

Aspect	Rank	Personal Coefficient	SE	Coefficient	Policy SE	Rank
Your freedom from being lied to, deceived, or betrayed	115	-0.137	(0.089)	0.052	(0.128)	69
You 'being the person you want to be'	116	-0.141	(0.087)	0.059	(0.166)	67
Your sense of control over your life	117	-0.146	(0.119)	0.020	(0.144)	87
How grateful you feel for the things in your life	118	-0.110	(0.036)	0.003	(0.119)	95
How often you can feel relaxed instead of feeling your life is hectic	119	-0.192	(0.086)	0.022	(0.191)	84
Your ability to use your imagination and be creative	120	-0.209	(0.100)	0.013	(0.155)	93
Freedom of conscience and belief in Mexico				0.421	(0.287)	1
The amount of order and stability in the Mexican society				0.245	(0.157)	16
The equality of opportunity in Mexico				0.222	(0.118)	18
The low rate of unemployment is in Mexico				0.1588	(0.140)	28
The average income of people in Mexico(GDP per capita)				0.131	(0.181)	35
The low the rate of criminality is in your town ( i.e no thieves, extortion, smuggling, kidnapping or murders)				0.127	(0.123)	37
The well-being of the people in Mexico				0.114	(0.095)	39
The low rate of addictions at home in Mexico				0.108	(0.142)	42
The efficiency of the local government of your town to provide basic public services				0.100	(0.152)	45
The general confidence in local institutions in Mexico				0.082	(0.153)	57
Mexicans getting the rewards and punishments they deserve				0.081	(0.130)	59
The low rate of drug trafficking is in your town				0.080	(0.163)	60
The efficiency of the Mexico Federal Government to solve socioeconomic problems				0.049	(0.208)	72
The low rate of inflation is in your nations economy				0.021	(0.130)	86
The extent to which your nation does things worthy of pride				0.020	(0.154)	88

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Table A.2 – Continued from previous page

Aspect	Personal			Policy		
	Rank	Coefficient	SE	Coefficient	SE	Rank
The total size of Mexico's economy (GDP)				0.014	(0.150)	91
The trust among the people in Mexico				0.014	(0.141)	92
The freedom from corruption, injustice, and abuse of power in Mexico				0.010	(0.138)	94
The low the rate of drug violence is in your town ( i.e murders by drug gangs, shootings, narcobloqueos, public hanging of corpses, beheadings)				0.001	(0.166)	96
The Mexican society helping the poor and others who struggle				-0.001	(0.145)	98
The amount of freedom in the Mexican society				-0.006	(0.150)	100
The equality of income in Mexico				-0.022	(0.141)	101
The morality, ethics, and goodness of other people in Mexico				-0.023	(0.162)	102
The low rate of domestic violence is in Mexico				-0.040	(0.127)	111
Mexico being a just society				-0.076	0.139	116
The coherent plan of the local government in your nation to take care peoples need				-0.097	(0.215)	124
The morality, ethics, and goodness of people who works for the safety of your town or neighborhood ( i.e. Police, Army)				-0.138	(0.149)	129
Freedom of speech and people's ability to take part in the political process and community life				-0.200	0.340	137
The rate of economic growth (GDP growth) over time in Mexico				-0.313	(0.183)	143
The reduce number of drug trafficking organizations in Mexico				-0.453	(0.223)	145

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Table A.2 – Continued from previous page

Aspect	Rank	Personal Coefficient	SE	Coefficient	Policy SE	Rank
<p>Note: Complete Respondents (N=259).            Personal Panel: OLS regression of stated preferences on 120 personal aspects using personal choice scenarios (N=1,052 observations). Policy Panel: OLS regression of stated preferences on 115 everyone aspects and 30 public aspects using policy scenarios (N=769 observations). Standard errors clustered at the respondent level.</p>						

Table A.3: Personal and Policy Scenarios-Marginal Utility Estimates for Respondents of Non-Violent Locations

Aspect	Rank	Personal		Coefficient	Policy	
		Coefficient	SE		SE	Rank
Your sense that you know what to do when you face choices in your life	1	0.763	(0.239)	0.576	(0.233)	17
The happiness of your friends	2	0.731	(0.169)			
Your ability to dream and pursue your dreams	3	0.675	(0.148)	0.416	(0.597)	28
Your health	4	0.503	(0.246)	0.854	(0.563)	7
The quality of your sleep	5	0.497	(0.215)	-0.724	(1.23)	140
Your physical safety and security	6	0.497	(0.178)	-0.066	(0.26)	90
The overall well-being of you and your family	7	0.439	(0.192)	0.085	(1.18)	68
You having the people around you think well of you and treat you with dignity and respect	8	0.427	(0.170)	0.220	(0.229)	51
Your home is free of addictions	9	0.40	(0.162)	-0.298	(0.253)	117
Your sense of connection with the universe or the power behind the universe	10	0.411	(0.150)	-0.158	(0.348)	101
You having a role to play in society	11	0.410	(0.161)	0.092	(0.278)	66
The quality of your romantic relationships, marriage, love life or sex life	12	0.403	(0.192)	0.411	(0.339)	29
Your feeling of independence and self-sufficiency	13	0.403	(0.154)	0.430	(0.404)	23
You having people around you who share your values, beliefs and interests	14	0.402	(0.188)	0.347	(0.199)	34
Your ability to be yourself and express yourself	15	0.387	(0.141)	-0.031	(0.228)	85
How much beauty you experience in your life	16	0.376	(0.158)	-0.059	(0.204)	89
Your neighborhood is safe ( i.e no thieves, extortion, smuggling, kidnapping or murders)	17	0.317	(0.213)	0.192	(0.371)	56
The absence of stress in your life	18	0.314	(0.180)	0.089	(0.329)	67
Your opportunities to participate in ceremonies, cultural events, and celebration	19	0.314	(0.180)	-0.598	(0.270)	136
You feeling that you are understood	20	0.311	(0.158)	-0.184	(2.48)	105
Your personal growth	21	0.304	(0.187)	-0.311	(0.378)	120
Your physical comfort	22	0.299	(0.159)	0.390	(0.599)	32

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Table A.3 – Continued from previous page

Aspect	Rank	Personal Coefficient	SE	Coefficient	Policy SE	Rank
The absence of anger in your life	23	0.296	(0.223)	0.957	(0.425)	4
Your ability to shape and influence the things around you	24	0.292	(0.133)	0.270	(0.233)	43
How much of the time you feel happy	25	0.283	(0.133)	0.318	(.254)	40
In your neighborhood there is not presence of drug trafficking organizations	26	0.281	(0.104)	0.281	(0.500)	42
How much love there is in your life	27	0.280	(0.157)	0.016	(0.263)	79
Your success at accomplishing your goals	28	0.279	(0.149)	0.579	(0.292)	16
How often you are able to challenge your mind in a productive or enjoyable way	29	0.271	(0.145)	0.004	(0.181)	81
How close your life is to being ideal	30	0.259	(0.153)	-0.110	(0.243)	94
The absence of worry in your life	31	0.252	(0.177)	0.245	0.375	48
Your knowledge, skills, and access to information	32	0.239	(0.143)	0.399	(0.826)	31
How rewarding the activities in your life are	33	0.234	(0.201)	0.425	(0.297)	26
You not being lonely	34	0.232	(0.170)	0.079	(0.166)	70
Your sense that you are competent and capable in the activities that matter to you	35	0.224	(0.143)	0.071	(0.211)	73
How fulfilling your life is	36	0.212	(0.220)	-0.428	(1.28)	129
You feeling alive and full of energy	37	0.210	(0.148)	-0.228	(0.360)	108
The overall quality of your experience at work	38	0.205	(0.154)	0.261	(0.253)	46
The amount of pleasure in your life	39	0.199	(0.120)	0.247	(0.365)	47
Your chance to live a long life	40	0.195	(0.158)	-0.131	(0.152)	97
You feeling that you have enough time and money for the things that are most important to you	41	0.187	(0.182)	0.948	(1.3)	6
How often you become deeply engaged in your daily activities	42	0.187	(0.182)	-0.342	(1.23)	123
The absence of frustration in your life	43	0.174	(0.308)	0.736	(0.389)	12
Your ability to fulfill your potential	44	0.171	(0.181)	-0.571	(0.439)	134
How interesting, fascinating, and free of boredom your life is	45	0.171	(0.140)	0.059	(0.46)	74

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Table A.3 – Continued from previous page

Aspect	Rank	Personal		Coefficient	Policy	
		Coefficient	SE		SE	Rank
The happiness of your family	46	0.170	(0.171)	0.467	(0.383)	22
Your rating of your life on a ladder where the lowest rung is 'worst possible life for you' and the highest rung is 'best possible life for you'	47	0.169	(0.134)	0.075	(0.211)	72
Your sense that you are standing up for what you believe in	48	0.167	(0.136)	-0.248	(0.224)	109
You having many moments in your life when you feel inspired	49	0.165	(0.170)	-0.041	(0.222)	88
Your ability to fully experience the entire range of healthy human emotions	50	0.161	(0.153)	-0.140	(0.282)	99
Your absence of internal conflict (conflict within yourself)	51	0.161	(0.146)	0.389	(0.299)	33
The extent to which you feel the things you do in your life are worthwhile	52	0.146	(0.141)	2.35	(1.36)	1
How satisfied you are with your life	53	0.144	(0.159)	0.302	(0.470)	41
The absence of humiliation and embarrassment in your life	54	0.139	(0.169)	0.101	(0.408)	64
Your ability to 'be in the moment'	55	0.128	(0.175)	0.121	(0.269)	62
You feeling that you are part of something bigger than yourself	56	0.121	(0.175)	-0.001	(0.241)	83
How high your income is compared to the income of other people around you	57	0.119	(0.176)			
Your freedom from emotional abuse or harassment	58	0.117	(0.174)	-0.222	(0.301)	107
The amount of fun and play in your life	59	0.108	(0.201)	-1.02	(0.600)	143
Your material standard of living	60	0.108	(0.178)	-0.280	(1.342)	116
Your ability to keep good perspective in your life	61	0.107	(0.127)	107-0.166	0.208	103
Your ability to have and raise children	62	0.102	(0.128)	-0.266	(0.642)	112
Your sense that your life is meaningful and has value	63	0.102	(0.290)	0.822	(.919)	9
Your power over other people	64	0.093	(0.151)	(1.38)		
Your sense that things are getting better and better	65	0.097	(0.148)	-0.191	(0.194)	106
Your pride and respect for yourself	66	0.089	(0.135)	0.048	(0.242)	76

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Table A.3 – Continued from previous page

Aspect	Rank	Personal		Policy		Rank
		Coefficient	SE	Coefficient	SE	
How peaceful, calm, and harmonious your life is	67	0.083	(0.113)	0.400	(0.217)	30
Your sense of optimism about your future	68	0.082	(0.144)	0.642	(0.537)	14
Your home is free of domestic violence	69	0.082	(0.220)	0.853	(0.468)	8
You feel safe in your neighborhood	70	0.077	(0.182)	0.199	(0.279)	55
The amount of order and stability in your life	71	0.076	(0.154)	0.429	(0.196)	24
You feeling that your life has direction	72	0.072	(0.121)	110		
You not feeling depressed	73	0.069	(0.168)	0.053	(0.251)	75
The absence of sadness in your life	74	0.069	(0.182)	-0.439	(0.362)	130
You being a good, moral person and living according to your personal values	75	0.067	(0.186)	-0.279	(0.370)	115
Your sense of discovery and wonder	76	0.063	(0.135)	-0.034	(0.303)	86
You having new things, adventure, and excitement in your life	77	0.062	0.147	0.133	(0.298)	60
The extent to which you 'have a good life'	78	0.052	(0.194)	0.320	(0.323)	39
The absence of regret you feel about your life	79	0.033	(0.170)	0.002	(0.391)	82
You feeling that you understand the world and the things going on around you	80	0.014	(0.198)	0.230	(0.275)	49
The absence of shame and guilt in your life	81	0.013	(0.126)	0.341	(0.325)	37
Your neighborhood is free of drug violence	82	0.0122	(0.141)	0.347	(0.358)	35
Your enjoyment of winning, competing, and facing challenges	83	-0.004	(0.151)	-0.257	(0.711)	111
Your sense of purpose	84	-0.034	(0.172)	-0.110	(0.206)	95
Your freedom from being lied to, deceived, or betrayed	85	-0.036	(0.151)	0.542	(0.239)	18
You feeling that things are going well for you	86	-0.050	(0.168)	-0.248	(2.79)	110
Your mental health and emotional stability	87	-0.051	(0.172)	-0.410	(0.291)	127
The quality of your family relationships	88	-0.054	(0.148)	-0.006	(0.233)	84
How often you smile or laugh	89	-0.074	(0.249)	-0.665	(0.344)	138
Your neighborhood is free of drug trafficking	90	-0.080	(0.183)	0.673	(0.517)	13
You not feeling anxious	91	-0.081	(0.194)	0.467	(0.383)	21
How grateful you feel for the things in your life	92	-0.088	(0.127)	-0.073	(0.240)	91

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Table A.3 – Continued from previous page

Aspect	Rank	Personal Coefficient	SE	Coefficient	Policy SE	Rank
Your sense of security about life and the future in general	93	-0.09	(0.145)	0.341	(0.325)	36
Your passion and enthusiasm about things in your life	94	-0.092	(0.207)	0.218	(0.55)	52
You are having many options and possibilities in your life and the freedom to choose among them	95	-0.116	(0.238)	-0.494	(1.05)	132
You feeling that you have been fortunate in your life	96	-0.123	(0.133)	0.150	(0.508)	59
Your financial security	97	-0.130	(0.182)	0.621	(0.392)	15
How glad you are to have the life you have rather than a different life	98	-0.131	(0.164)	0.424	(0.496)	27
You 'being the person you want to be'	99	-0.141	(0.195)	-0.322	(0.862)	122
The absence of fear in your life	100	-0.151	(0.165)	-0.702	(0.365)	139
You having people you can turn to in time of need	101	-0.153	(0.167)	0.263	(0.179)	45
How easy and free of annoyances your life is	102	-0.59	(0.150)	-0.343	(0.461)	124
How much you appreciate your life	103	-0.165	(0.231)	1.11	(1.61)	2
How full of beautiful memories your life is	104	-0.167	(0.159)	0.180	(0.218)	58
Your social status	105	-0.177	(0.152)			
How much you like your life	106	-0.186	(0.251)	0.097	(0.448)	65
How happy you feel	107	-0.199	(0.136)	-0.377	(0.353)	126
You having others remember you and your accomplishments long after your death	108	-0.220	(0.181)			
You having a beautiful life story, or a life that is 'like a work of art'	109	-0.223	(0.166)	-0.096	(0.475)	93
Your sense that everything happens for a reason	110	-0.240	(0.168)	0.952	(0.512)	5
Your freedom from pain	111	-0.245	(0.245)	-0.156	(0.234)	100
How often you can feel relaxed instead of feeling your life is hectic	112	-0.253	(0.189)	0.205	(0.357)	53
Your sense of achievement and excellence	113	-0.295	(0.175)	-0.595	(0.379)	135
Your ability to use your imagination and be creative	114	-0.259	(0.253)	0.225	(0.306)	50

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Table A.3 – Continued from previous page

Aspect	Rank	Personal		Policy		Rank
		Coefficient	SE	Coefficient	SE	
How much you enjoy your life	115	-0.287	0.209	0.769	(0.285)	11
How desirable your life is	116	-0.287	(0.204)	-0.308	(0.323)	118
Your sense of community, belonging, and connection with other people	117	-0.287	(0.204)	0.024	(0.226)	77
You getting the things you want out of life	118	-0.312	(0.142)	-0.362	(0.382)	125
Your sense of control over your life	119	-0.414	(0.206)	-0.084	(0.224)	92
Your sense that you are making a difference, actively contributing to the well-being of other people	120	-0.635	(0.376)	0.075	(0.234)	71
The efficiency of the Mexico Federal Government to solve socioeconomic problems				0.981	(1.73)	3
The low the rate of criminality is in your town ( i.e no thieves, extortion, smuggling, kidnapping or murders)				0.821	(0.389)	10
The total size of Mexico's economy (GDP)				0.506	(0.300)	19
Freedom of conscience and belief in Mexico				0.472	(0.374)	20
The low rate of unemployment is in Mexico				0.427	(0.235)	25
The equality of opportunity in Mexico				0.327	(0.287)	38
The amount of order and stability in the Mexican society				0.270	(0.206)	44
The low rate of drug trafficking is in your town				0.204	(0.222)	54
The low the rate of drug violence is in your town ( i.e murders by drug gangs, shootings, narcobloqueos, public hanging of corpses, beheadings)				0.123	(0.347)	61
The efficiency of the local government of your town to provide basic public services				0.106	(0.242)	63
The average income of people in Mexico(GDP per capita)				0.079	(0.240)	69
The general confidence in local institutions in Mexico				0.024	(0.327)	78
The trust among the people in Mexico				0.012	(0.235)	80
The low rate of domestic violence is in Mexico				-0.040	(0.212)	87
Mexicans getting the rewards and punishments they deserve				-0.122	(0.231)	96

Continued on next page

Table A.3 – Continued from previous page

Aspect	Personal			Policy		
	Rank	Coefficient	SE	Coefficient	SE	Rank
The Mexican society helping the poor and others who struggle				-0.137	(0.216)	98
The morality, ethics, and goodness of people who works for the safety of your town or neighborhood ( i.e. Police, Army)				-0.165	(0.281)	102
Mexico being a just society				-0.168	0.300	104
The low rate of addictions at home in Mexico				-0.267	(0.428)	113
The amount of freedom in the Mexican society				-0.278	(0.208)	114
The coherent plan of the local government in your nation to take care peoples need				-0.309	(0.725)	119
The rate of economic growth (GDP growth) over time in Mexico				-0.321	(0.256)	121
The freedom from corruption, injustice, and abuse of power in Mexico				-0.420	(0.347)	128
The well-being of the people in Mexico				-0.487	(0.272)	131
The morality, ethics, and goodness of other people in Mexico				-0.550	(0.827)	133
The equality of income in Mexico				-0.644	(0.312)	137
Freedom of speech and people’s ability to take part in the political process and community life				-0.826	(2.125)	141
The extent to which your nation does things worthy of pride				-0.918	(0.466)	141
The low rate of inflation is in your nations economy				-1.360	(0.678)	144
The reduce number of drug trafficking organizations in Mexico				-1.715	(2.13)	145

Note: Personal Panel: OLS regression of stated preferences on 120 personal aspects using personal choice scenarios (N=384 observations). Policy Panel: OLS regression of stated preferences on 115 everyone aspects and 30 public aspects using policy scenarios (N=283 observations). Standard errors clustered at the respondent level.

Table A.4: Personal and Policy Scenarios-Marginal Utility Estimates for Respondents of Violent Locations

Aspect	Rank	Personal Coefficient	SE	Coefficient	Policy SE	Rank
You getting the things you want out of life	1	0.416	(0.127)	0.236	(0.223)	22
Your sense that everything happens for a reason	2	0.329	(0.091)	-0.083	(0.207)	104
Your knowledge, skills, and access to information	3	0.314	(0.109)	-0.232	(0.178)	125
Your ability to fully experience the entire range of healthy human emotions	4	0.314	(0.112)	0.112	(0.276)	51
Your ability to keep good perspective in your life	5	0.267	(0.142)	0.021	(0.149)	82
The happiness of your family	6	0.267	(0.142)	0.112	(0.182)	52
Your sense of purpose	7	0.257	(0.112)	-0.105	(0.225)	106
The absence of humiliation and embarrassment in your life	8	0.052	(0.095)	0.155	(0.205)	44
Your enjoyment of winning, competing, and facing challenges	9	0.252	(0.120)	-0.036	(0.169)	96
Your sense that you are standing up for what you believe in	10	0.248	(0.135)	0.161	(0.235)	43
You having a beautiful life story, or a life that is 'like a work of art'	11	0.248	(0.113)	0.062	(0.199)	70
The absence of stress in your life	12	0.243	(0.100)	0.179	(0.216)	36
You are having many options and possibilities in your life and the freedom to choose among them	12	0.252	(0.139)	-0.133	(0.253)	109
Your absence of internal conflict (conflict within yourself)	14	0.227	(0.146)	0.404	(0.184)	5
Your ability to dream and pursue your dreams	15	0.225	(0.110)	0.25	(0.250)	20
How much you appreciate your life	16	0.220	(0.118)	0.341	(0.234)	11
How much you enjoy your life	17	0.218	(0.141)	0.178	(0.153)	37
Your ability to be yourself and express yourself	15	0.212	(0.092)	-0.023	(0.176)	92
Your neighborhood is safe ( i.e no thieves, extortion, smuggling, kidnapping or murders)	19	0.207	(0.105)	0.171	(0.203)	41

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Table A.4 – Continued from previous page

Aspect	Rank	Personal Coefficient	SE	Coefficient	Policy SE	Rank
You feeling that you have enough time and money for the things that are most important to you	20	0.205	(0.100)	0.031	(0.188)	79
How interesting, fascinating, and free of boredom your life is	21	0.199	(0.134)	-0.152	(0.29)	113
Your sense that things are getting better and better	22	0.190	(0.137)	-0.033	(0.236)	97
How often you smile or laugh	23	0.186	(0.109)	-0.280	(0.312)	130
Your success at accomplishing your goals	24	0.181	(0.142)	-0.316	(0.307)	137
Your sense of achievement and excellence	25	0.177	(0.118)	-0.286	(0.277)	1233
You having a role to play in society	26	0.173	(0.105)	0.187	(0.199)	32
Your personal growth	27	0.169	(0.089)	0.153	(0.155)	45
Your sense that you are making a difference, actively contributing to the well-being of other people	28	0.150	(0.108)	-0.022	(0.283)	91
The overall quality of your experience at work	29	0.147	(0.081)	-0.389	(0.241)	141
Your material standard of living	30	0.136	(0.092)	0.192	(0.145)	31
Your sense of community, belonging, and connection with other people	31	0.134	(0.114)	0.127	(0.204)	49
You feeling that you are part of something bigger than yourself	32	0.133	(127)	0.097	(0.187)	57
The amount of fun and play in your life	33	0.133	(0.119)	0.023	(0.149)	81
Your mental health and emotional stability	34	0.128	(0.115)	0.349	(0.161)	9
The extent to which you feel the things you do in your life are worthwhile	35	0.127	(0.095)	-0.258	(0.318)	128
How glad you are to have the life you have rather than a different life	36	0.126	(0.09)	-0.013	(0.211)	84
You feeling that your life has direction	37	0.124	(0.102)	-0.232	(0.187)	126
The extent to which you 'have a good life'	38	0.124	(0.107)	0.0744	(0.140)	63
How happy you feel	39	0.123	(0.108)	0.107	(0.170)	54
The absence of anger in your life	40	0.121	(0.124)	0.148	(0.215)	46
You having others remember you and your accomplishments long after your death	41	0.116	(0.181)			

Continued on next page

Table A.4 – Continued from previous page

Aspect	Rank	Personal Coefficient	SE	Coefficient	Policy SE	Rank
How often you are able to challenge your mind in a productive or enjoyable way	42	0.114	(0.089)	0.110	(0.228)	53
Your sense of discovery and wonder	43	0.110	(0.103)	0.207	(0.186)	26
How often you become deeply engaged in your daily activities	44	0.106	(0.099)	0.064	(0.170)	69
You feeling that you understand the world and the things going on around you	45	0.100	(0.094)	0.051	(0.148)	75
You not feeling anxious	46	0.097	(0.107)	0.237	(0.186)	21
How easy and free of annoyances your life is	47	0.096	(0.136)	-0.162	(0.250)	115
The quality of your sleep	48	0.087	(0.126)	0.057	(0.186)	72
Your social status	49	0.085	(0.095)			
Your power over other people	50	0.085	(0.095)			
Your sense of connection with the universe or the power behind the universe	51	0.077	(0.099)	-0.175	(0.235)	118
Your ability to shape and influence the things around you	52	0.073	(0.088)	0.186	(0.131)	35
The absence of frustration in your life	53	0.069	(0.083)	0.326	(0.221)	15
The absence of regret you feel about your life	54	0.068	(0.101)	-0.309	(0.422)	136
Your health	55	0.066	(0.102)	-0.338	(0.366)	138
How peaceful, calm, and harmonious your life is	56	0.061	(0.129)	-0.362	(0.280)	140
You feeling that you are understood	57	0.059	(0.117)	0.070	(0.191)	64
Your freedom from emotional abuse or harassment	58	0.058	(0.113)	-0.042	(0.136)	99
Your financial security	59	0.055	(0.100)	0.06	(0.174)	65
The amount of pleasure in your life	60	0.051	(0.104)	-0.019	(0.161)	90
The overall well-being of you and your family	61	0.044	(0.118)	-0.280	(0.284)	131
You feeling alive and full of energy	62	0.0400	(0.109)	-0.076	(0.166)	103
Your sense of optimism about your future	63	0.031	(0.116)	0.079	(0.143)	62
Your home is free of addictions	64	0.028	(0.132)	-0.064	(0.197)	101
How high your income is compared to the income of other people around you	65	0.027	(0.134)			

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Table A.4 – Continued from previous page

Aspect	Rank	Personal		Policy		Rank
		Coefficient	SE	Coefficient	SE	
The quality of your family relationships	66	0.027	(0.130)	0.128	(0.238)	48
You having people around you who share your values, beliefs and interests	67	0.026	(0.117)	0.048	(0.175)	34
Your ability to 'be in the moment'	68	0.025	(0.127)	0.094	(0.326)	58
Your chance to live a long life	69	0.022	(0.162)	0.064	(0.158)	68
You having the people around you think well of you and treat you with dignity and respect	70	0.022	(0.104)	-0.015	(0.244)	87
Your sense that your life is meaningful and has value	71	0.018	(0.123)	-0.276	(0.250)	129
How much you like your life	72	0.016	(0.077)	-0.015	(0.135)	65
Your sense of control over your life	73	0.0120	(0.148)	-0.056	(0.220)	73
Your sense that you are competent and capable in the activities that matter to you	74	0.012	(0.102)	-0.129	(0.218)	108
Your pride and respect for yourself	75	0.005	(0.131)	0.361	(0.218)	8
The amount of order and stability in your life	76	0.004	(0.087)	0.305	(0.183)	16
How desirable your life is	77	0.002	(0.102)	0.204	(0.187)	27
You not being lonely	78	-0.003	(0.105)	0.051	(0.161)	74
Your feeling of independence and self-sufficiency	79	-0.004	(0.127)	0.123	(0.142)	50
How grateful you feel for the things in your life	80	-0.010	(0.122)	0.223	(0.181)	23
You feeling that things are going well for you	81	-0.001	(0.092)	-0.099	(0.164)	105
The absence of shame and guilt in your life	82	-0.012	(0.069)	0.342	(0.236)	10
How rewarding the activities in your life are	83	-0.012	(0.106)	-0.175	(0.270)	117
Your sense of security about life and the future in general	84	-0.020	0.097	-0.442	(0.287)	144
Your rating of your life on a ladder where the lowest rung is 'worst possible life for you' and the highest rung is 'best possible life for you'	85	-0.024	(0.126)	0.186	(0.177)	34
The absence of sadness in your life	86	-0.025	(0.117)	-0.018	(0.019)	88
Your neighborhood is free of drug trafficking	87	-0.026	(0.088)	0.784	(0.400)	2
How full of beautiful memories your life is	88	-0.028	(0.141)	-0.426	(0.245)	142
How fulfilling your life is	89	-0.034	(0.138)	-0.217	(0.332)	122

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Table A.4 – Continued from previous page

Aspect	Rank	Personal		Policy		Rank
		Coefficient	SE	Coefficient	SE	
Your physical comfort	90	-0.0356	(0.118)	-0.035	(0.266)	94
Your home is free of domestic violence	91	-0.041	(0.104)	-0.358	(0.211)	139
Your physical safety and security	92	-0.042	(0.121)	0.296	(0.166)	17
The absence of fear in your life	93	-0.045	(0.107)	0.212	(0.192)	25
You feel safe in your neighborhood	94	-0.048	(0.126)	0.402	(0.225)	6
Your neighborhood is free of drug violence	95	-0.048	(0.119)	-0.041	(0.238)	98
Your ability to fulfill your potential	96	-0.052	(0.102)	0.059	(0.241)	71
You having new things, adventure, and excitement in your life	97	-0.055	0.088	-0.226	(0.219)	124
You having people you can turn to in time of need	98	-0.055	(0.110)	-0.072	(0.179)	102
You being a good, moral person and living according to your personal values	99	-0.060	(0.118)	0.319	(0.180)	13
How much of the time you feel happy	100	-0.068	(0.150)	0.019	(0.193)	83
You not feeling depressed	101	-0.071	(0.089)	-0.167	(0.157)	116
How satisfied you are with your life	102	-0.074	(0.117)	0.145	(0.202)	112
Your ability to have and raise children	103	-0.077	(0.118)	-0.283	(0.184)	132
Your freedom from pain	104	-0.083	(0.114)	-0.174	(0.155)	40
You having many moments in your life when you feel inspired	105	-0.087	(0.254)	-0.018	(0.188)	89
How much love there is in your life	106	-0.093	(0.151)	0.187	(0.148)	33
Your passion and enthusiasm about things in your life	107	-0.096	(0.106)	-0.035	(0.164)	95
The happiness of your friends	108	-0.122	(0.117)			
How close your life is to being ideal	109	-0.130	(0.131)	-0.245	(0.183)	127
You 'being the person you want to be'	110	-0.154	(0.100)	0.132	(0.182)	47
Your sense that you know what to do when you face choices in your life	111	-0.168	(0.126)	0.512	(0.229)	3
The quality of your romantic relationships, marriage, love life or sex life	112	-0.172	(0.128)	0.201	(0.214)	29
Your opportunities to participate in ceremonies, cultural events, and celebration	113	-0.194	(0.149)	-0.137	(0.193)	110

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Table A.4 – Continued from previous page

Aspect	Rank	Personal		Policy		Rank
		Coefficient	SE	Coefficient	SE	
The absence of worry in your life	114	-0.207	(0.100)	-0.157	(0.160)	114
Your freedom from being lied to, deceived, or betrayed	115	-0.022	(0.114)	0.299	(0.182)	135
How often you can feel relaxed instead of feeling your life is hectic	116	-0.231	(0.101)	0.198	(0.394)	30
You feeling that you have been fortunate in your life	117	-0.232	(0.115)	0.278	(0.166)	19
In your neighborhood there is not presence of drug trafficking organizations	118	-0.249	(0.114)	0.278	(0.177)	18
Your ability to use your imagination and be creative	119	-0.294	(0.114)	0.224	(0.206)	123
How much beauty you experience in your life	120	-0.320	(0.134)	-0.194	(0.219)	121
Freedom of conscience and belief in Mexico				0.9805	(0.567)	1
The well-being of the people in Mexico				0.420	(0.169)	4
The low rate of drug trafficking is in your town				0.337	(0.264)	12
The amount of order and stability in the Mexican society				0.318	(0.153)	14
The low rate of domestic violence is in Mexico				0.214	(0.217)	24
The Mexican society helping the poor and others who struggle				0.202	(0.219)	28
The extent to which your nation does things worthy of pride				0.176	(0.155)	38
The average income of people in Mexico(GDP per capita)				0.174	(0.367)	39
The equality of opportunity in Mexico				0.166	(0.152)	42
The freedom from corruption, injustice, and abuse of power in Mexico				0.104	(0.162)	55
The low rate of unemployment is in Mexico				0.100	(0.274)	56
The low rate of addictions at home in Mexico				0.093	(0.178)	59
The trust among the people in Mexico				0.093	(0.200)	60
The equality of income in Mexico				0.904	(0.200)	61
The low rate of inflation is in your nations economy				0.067	(0.151)	66

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Table A.4 – Continued from previous page

Aspect	Personal			Policy		
	Rank	Coefficient	SE	Coefficient	SE	Rank
The low the rate of criminality is in your town ( i.e no thieves, extortion, smuggling, kidnapping or murders)				0.067	(0.153)	67
The efficiency of the local government of your town to provide basic public services				0.050	(0.254)	76
The efficiency of the Mexico Federal Government to solve socioeconomic problems				0.037	(0.235)	78
Mexicans getting the rewards and punishments they deserve				0.023	(0.179)	80
The low rate of drug trafficking is in your town				-0.013	(0.688)	85
The morality, ethics, and goodness of other people in Mexico				-0.028	(0.223)	93
The morality, ethics, and goodness of other people in Mexico				-0.049	(0.199)	100
The general confidence in local institutions in Mexico				-0.126	(0.204)	107
Mexico being a just society				-0.141	(0.173)	111
The total size of Mexico's economy (GDP)				-0.185	(0.189)	119
The coherent plan of the local government in your nation to take care peoples need				-0.193	(0.265)	121
Freedom of speech and people's ability to take part in the political process and community life				-0.290	(0.372)	134
The rate of economic growth (GDP growth) over time in Mexico				-0.903	(0.615)	145

Note: Personal Panel: OLS regression of stated preferences on 120 personal aspects using personal choice scenarios (N=668 observations). Policy Panel: OLS regression of stated preferences on 115 everyone aspects and 30 public aspects using policy scenarios (N=486 observations). Standard errors clustered at the respondent level.

## A.1 Survey Design

### A.1.1 Scenario Screens

The design of the experimental survey consists of 15 hypothetical choice scenarios, one per screen and they are preceded by demographic questions and screen of instructions. The scenarios consider possible fundamental and combinatorial aspects of well-being. We have five different lists of well-being aspects, to simplify we name an "x-list" for those aspects that include 115-you private aspects, a named "X-list" contains 5-only you private aspects, a "y list" contains 115-other's private aspects, a "Z-list" contain 30-public aspects and a "z list" contains 115-people's private aspects. Each scenario has either 6 or 8 aspects and they were selected randomly by the computer. The algorithm optimizes the selection of aspects to avoid repetition in each scenario. The repetition of the scenarios are as follows: 3 repetitions of type A on which the selection of aspects is all drawn at random from the x and X list. 3 repetitions of type B which aspects are a draw at random from the list z and Z. 2 repetitions of type C which aspects are drawn from the list Z and y.

The scenario type D (1 repetition) draw aspects from the x,X and Z list. The scenario type E (1 repetition) draws 6 or 8 aspects from all types of list. In scenario type F (1 repetition) the selection of aspects was made by constructing packages selected randomly following the next criteria: in the 6 aspect case, the computer chooses 2 aspects at random of x-list and from y-list considering 115 possibilities in each, then the computer chose one aspect from the X list and one from Z-list variables but the selection was from a subsample of the list, that is only from the aspects number 109 to 150. In the 8 aspects per scenario case, the computer chooses 3 aspects at random from the x, y list considering the 115 possibilities, then it chooses 2 aspects from the X and Z list from the same subsample 109-150.

The selection of aspects for the scenario type G (1 repetition) is different. In this scenario, we narrow the criteria of selection of aspects by classified British<sup>1</sup> and "Deaton"<sup>2</sup> well-being aspects. The selection was as follows: a pair of 2 aspects are selected randomly considering the first 34 aspects of the x-list and from y-list.

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<sup>1</sup>Dolan, Layard, and Metcalfe (2011) Office for National Statistics (ONS)

<sup>2</sup>Deaton, Kahneman, Krueger, Schkade, Schwarz, and Stones (2011) memo to the ONSs Advisory Group on Subjective Well-Being

The aspect type numbers 1, 2, 7, 23, 27, 29, 32, 33, and 34 are considered British and Deaton aspects and for this scenario the computer chooses non-British non-Deaton aspects. The selection was made at random from the well-being aspect numbers 3-6, 8-22, 24-26, 28, 30 and 31. At the end, we have a pair from the x-list and from y-list and the last two aspects are chosen from the list type Z considering only aspects from 121-150 which refer to public issues.

In scenario type H, only one repetition is considered and focus on public aspects: 25 aspects in total. There are 7 personal-drug war and 7-others-drug war-related well-being aspects on the x-list and y-list. There are also 11 public questions in type list Z. For the case of 6 type scenario, the computer chooses two aspects chosen at random from the [109-115] x-list and from y-list and two from the [140-150] list type Z. In an 8 case scenario, the computer chooses at random 3 aspects from the x,y-list and 2 aspects from the list type Z. The computer chooses in each case if the scenario has 6 or 8 aspects and it randomizes the order of aspects selected.

Finally, the scenario type I has two repetitions and it has the function to be a placebo. These scenarios are chosen to have 8 or 6 aspects with equal probability. The aspects are chosen randomly from the lists types x, X, Z, and y. We have a 0 value assigned to all the aspects except the selected. The nonzero one has a nonzero value drawn from -3, -2, -1, 1, 2, 3 with 1/6 chance each.

### **A.1.2 Aspects of Well-Being: Legends**

To facilitate tracking the origin of each aspect on the list used, we indicate the references in the parentheses next to each aspect and the aspect classes x,X, Y, z and Z used to design each scenario. The references are used on Benjamin et al .(2014) and this paper incorporates aspects related to measures of violence, risk and safety in urban warfare :

- SWB: Based on Benjamin et al (2014), We use this abbreviation to indicate aspects modeled after SWB measures used in large-scale surveys, including: the Euro-Barometer Survey; the European Social Survey; the German Socioeconomic Panel; the Japanese Life in Nation survey; the U.S.-based Gallup-Healthways Well-Being Index, General Social Survey, Health and Retirement Study, National Survey of Families and Households, and Survey of

Consumers; and the World Values Survey.

- AHC: Anand, Paul et al. 2009. The Development of Capability Indicators. *Journal of Human Development and Capabilities*, 10(1): 125-152.
- BMP: Bauer, Jack J., Dan P. McAdams, and Jennifer L. Pals. 2008. Narrative Identity and Eudaimonic Well-Being. *Journal of Happiness Studies*, 9: 81-104.
- BMP: Bauer, Jack J., Dan P. McAdams, and Jennifer L. Pals. 2008. Narrative Identity and Eudaimonic Well-Being. *Journal of Happiness Studies*, 9: 81-104.
- BHKR: Benjamin, Daniel J., Ori Heffetz, Miles S. Kimball, and Alex Rees-Jones. 2012. What Do You Think Would Make You Happier? What Do You Think You Would Choose? *American Economic Review*, 102(5): 2083-2110
- BC: Bliss, Christopher. 1993. *Life Style and the Standard of Living. The Quality of Life*. Ed. Martha Nussbaum and Amartya Sen. New York: Oxford University Press.
- ABS: Bradburn, Norman M. 1969. *Structure of Psychological Well-Being*. Chicago: Aldine Pub
- BBM: Bronsteen, John, Christopher J. Buccafusco, and Jonathan S. Masur. 2010. Welfare as Happiness. *Georgetown Law Journal*, 98: 1583.
- BD: Brooks, David. 2011. *The Social Animal: the hidden sources of love, character, and achievement*. New York: Random House
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- FP: Fernando Plascencia, own introspection for analyzing urban warfare (Drug War in Mexico)
- Obj: Subjective measures of indicators of Mexican Socioeconomic Indicators

Table A.5: Aspects 1–120: Applied for Self (you,only you-aspects)

List Type	Aspect
x1	how satisfied you are with your life (SWB,DS)
x2	your rating of your life on a ladder where the lowest rung is worst possible (SWB,KD,DKS)
x3	how close your life is to being ideal (MS,DE)
x4	the overall well-being of you and your family (BHKS)
x5	you feeling that things are going well for you (MS,DE)
x6	you getting the things you want out of life (ABS,DE,SN)
x7	the extent to which you feel the things you do in your life are worthwhile (DLM)
x8	how fulfilling your life is (SN,SLW,KN,DE)
x9	how rewarding the activities in your life are (WD,DLM)
x10	you having a beautiful life story, or a life that is 'like a work of art' (RS)
x11	how full of beautiful memories your life is (BHWS)
x12	how grateful you feel for the things in your life (DE,SM)
x13	how much you appreciate your life (SM,TJ)
x14	the absence of regret you feel about your life (SM,HRS)
x15	how desirable your life is (KR)
x16	how glad you are to have the life you have rather than a different life (KN,ABS)
x17	the extent to which you 'have a good life' (SN,KN)
x18	how much you like your life (BHKS)
x19	you feeling that you have been fortunate in your life (BHKS)
x20	your sense of optimism about your future (SM,DE-Flourishing)
x21	you having many options and possibilities in your life and the freedom to choose among them (SN,DS,RW)

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Table A.5 – *Continued from previous page*

<b>List Type</b>	<b>Aspect</b>
x22	your sense that things are getting better and better (DBD)
x23	how happy you feel (SWB,DS)
x24	how much of the time you feel happy (SWB,DS,KD,DE)
x25	how often you smile or laugh (G,SM,DS,KD,SWB)
x26	how much you enjoy your life (DBD,AHC,Q,DS,KD,SWB)
x27	the absence of sadness in your life (DE-SPANE, DS, KD, DKS)
x28	you not feeling depressed (GHQ, ABS, R)
x29	the absence of anger in your life (DKS, DE-SPANE, KD)
x30	the absence of frustration in your life (WD, DS)
x31	the absence of fear in your life (SN, PANAS, DE-SPANE, DS)
x32	you not feeling anxious (DLM, WD)
x33	the absence of stress in your life (DKS, GHQ, DLM, DE, KD, DS)
x34	the absence of worry in your life (DLM, GHQ, KD, DKS)
x35	the quality of your sleep (DKS)
x36	your physical safety and security (GBF, CR, G, Q, DG, M2, SN, SSF)
x37	the amount of order and stability in your life (BHKS)
x38	your sense of security about life and the future in general (BHKS)
x39	your physical comfort (M1)
x40	your freedom from pain (DG, BHKR, SN, DKS)
x41	how easy and free of annoyances your life is (HRS)
x42	how peaceful, calm, and harmonious your life is (TJ, GBF)
x43	how often you can feel relaxed instead of feeling your life is hectic (DLM, WD, WSC)
x44	you feeling that you have enough time and money for the things that are most important to you (BHKS)
x45	your financial security (DBD, DLM, G, DG)

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Table A.5 – *Continued from previous page*

<b>List Type</b>	<b>Aspect</b>
x46	your material standard of living (DE, WSC, SSF)
x47	your ability to dream and pursue your dreams (LU)
x48	your ability to use your imagination and be creative (SN, AHC, KN, RW)
x49	you having many moments in your life when you feel inspired (SM, PANAS)
x50	how much beauty you experience in your life (WA, SM, RW)
x51	the amount of pleasure in your life (WD, BBM, DE, DS)
x52	the amount of fun and play in your life (SN, BHKR, GBF)
x53	you having new things, adventure, and excitement in your life (ST)
x54	your sense of discovery and wonder (SM, M(desire))
x55	you feeling that you understand the world and the things going on around you (DG, BMP, M(desire))
x56	your knowledge, skills, and access to information (GBF, SM, SN, SSF, RW)
x57	how often you are able to challenge your mind in a productive or enjoyable way (WA, DE)
x58	how interesting, fascinating, and free of boredom your life is (DE, ABS, PANAS, BHKR, DS)
x59	your ability to be yourself and express yourself (WA, BMP, LU, M5)
x60	your personal growth (R, BMP)
x61	you being the person you want to be (SN, BHKS)
x62	your ability to fulfill your potential (TJ, WSC, R, M5)
x63	your sense of purpose (R, DE-Flourishing, KN, TJ, BHKR, DS)
x64	you feeling that your life has direction (RS, AHC, RW)
x65	your sense of control over your life (SN, G, BHKR, R)
x66	your sense that your life is meaningful and has value (G, LU,R, SM, KN, GBF, TJ, DE-Flourishing,DS, M(desire))
x67	your sense that you are making a difference, actively contributing to the well-being of other people (DS,

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Table A.5 – *Continued from previous page*

<b>List Type</b>	<b>Aspect</b>
	DE-Flourishing, BBM, LU, DLM) and making the world a better place
x68	the overall quality of your experience at work (DS, KSS, DG, DE, SM, DLM, SN, SSF)
x69	how often you become deeply engaged in your daily activities (DE-Flourishing, DS, WSC)
x70	your feeling of independence and self-sufficiency (SN, R, DCG, M4, MS)
x71	your sense that you are competent and capable in the activities that matter to you (DE-Flourishing, WA)
x72	your ability to shape and influence the things around you
x73	your sense of achievement and excellence (MS, SN, KN, RS, DS)
x74	your enjoyment of winning, competing, and facing challenges (WA)
x75	your success at accomplishing your goals (SLW, DE, DS)
x76	your chance to live a long life (SN, AHC, SSF)
x77	your health (SM, G, RS, Q, DS, SN, SSF, RW)
x78	your mental health and emotional stability (DG, SN, AHC, GHQ, DS, DLM, TJ)
x79	your absence of internal conflict (conflict within yourself) (RS, BMP)
x80	your ability to fully experience the entire range of healthy human emotions (LU, SN)
x81	you feeling alive and full of energy (DLM, WA, DG, PANAS, RW)
x82	your passion and enthusiasm about things in your life (PANAS, SM)
x83	your pride and respect for yourself (PANAS, ABS, SN, DE, RW)
x84	you having the people around you think well of you and treat you with dignity and respect (AHC, SN, M4, DE-Flourishing, RW)
x85	you having a role to play in society (TJ, AHC, DG, DBD, SN)

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Table A.5 – *Continued from previous page*

<b>List Type</b>	<b>Aspect</b>
x86	how much love there is in your life (SN, KN, RS, SM)
x87	the quality of your romantic relationships, marriage, love life or sex life (SM, SN, AHC, KSS, DS, M3, R)
x88	your ability to have and raise children (AHC, DCG, KSS, SN)
x89	the quality of your family relationships (TJ, AHC, DS, M3, R, SSF)
x90	the happiness of your family (BHKR, LU)
x91	your sense of community, belonging, and connection with other people (SN, DS, LU, DE-Flourishing)
x92	you having people around you who share your values, beliefs and interests (HRS)
x93	you having people you can turn to in time of need (DE-Flourishing, HRS)
x94	you not being lonely (ABS, DS, SM)
x95	you feeling that you are understood (BHKS)
x96	your opportunities to participate in ceremonies, cultural events, and celebrations (BHKS)
x97	your freedom from being lied to, deceived, or betrayed (M(desire), HRS)
x98	your freedom from emotional abuse or harassment (BHKS)
x99	the absence of humiliation and embarrassment in your life (SN)
x100	the absence of shame and guilt in your life (PANAS, DCG, SN)
x101	your sense that everything happens for a reason (BHKS)
x102	your sense of connection with the universe or the power behind the universe (TJ)
x103	you being a good, moral person and living according to your personal values (DBD, DE-Flourishing, MS, RS, TJ)
x104	you feeling that you are part of something bigger than yourself (SM, TJ)
x105	your sense that you are standing up for what you believe in (BHKS)

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Table A.5 – *Continued from previous page*

<b>List Type</b>	<b>Aspect</b>
x106	your sense that you know what to do when you face choices in your life (BHKS)
x107	your ability to 'be in the moment' (HRS)
x108	your ability to keep good perspective in your life (BHKS)
x109	your home is free of domestic violence (FP)
x110	your home is free of addictions (FP)
x111	your neighborhood is safe ( i.e no thieves, extortion, smuggling, kidnapping or (FP)
x112	you feel safe in your neighborhood (FP)
x113	your neighborhood is free of drug violence ( i.e murders by drug gangs, shooting, narcobloqueos, public hanging of corpses, beheading) (FP)
x114	your neighborhood is free of drug trafficking (FP)
x115	in your neighborhood there is not presence of drug trafficking organizations (FP)
X116	how high your income is compared to the income of other people around you (DS, TJ)
X117	your power over other people (BHKS)
X118	your social status (DCG, TJ, BHKR, M)
X119	you having others remember you and your accomplishments long after your death (BD)
X120	the happiness of your friends (MS, BHKR, LU)

Table A.6: Aspects 1–115:Applied to Others (others-aspects)

<b>List Type</b>	<b>Aspect</b>
y1	How satisfied are others with their lives
y2	Other’s ratings of their lives on a ladder where the lowest rung is the worst possible scenario
y3	How close others’s lives are to being ideal
y4	The overall well-being of others and their families
y5	Others feeling that things are going well for them
y6	Others getting the things they want out of life
y7	The extent to which others feel the things they do in their lives are worthwhile
y8	How fulfilling others’s lives are
y9	How rewarding the activities in others’s lives are
y10	Others having a beautiful life story, or a life that is ‘like a work of art’
y11	How full of beautiful memories others’s lives are
y12	How grateful others feel for the things in their lives
y13	How much others appreciate their lives
y14	The absence of regret others feel about their lives
y15	How desirable others lives are
y16	How glad others are to have the lives they have rather than different lives
y17	The extent to which others ‘have a good life’
y18	How much others like their lives
y19	Others feeling that they have been fortunate in their lives
y20	Others’ sense of optimism about their future
y21	Others having many options and possibilities in their lives and the freedom to c
y22	Others’ sense that things are getting better and better
y23	How happy others feel
y24	How much of the time others feel happy
y25	How often others smile or laugh
y26	How much others enjoy their lives
y27	The absence of sadness in others’s lives
y28	Others not feeling depressed

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Table A.6 – *Continued from previous page*

<b>List Type</b>	<b>Aspect</b>
y29	The absence of anger in others' lives
y30	The absence of frustration in others' lives
y31	The absence of fear in others lives
y32	People not feeling anxious
y33	The absence of stress in others' lives
y34	The absence of worry in others' lives
y35	The quality of others' sleep
y36	Others' physical safety and security
y37	The amount of order and stability in other's lives
y38	Other's sense of security about life and the future in general
y39	Others? physical comfort
y40	Others? freedom from pain
y41	How easy and free of annoyances others' lives are
y42	How peaceful, calm, and harmonious others' lives are
y43	How often others can feel relaxed instead of feeling their lives are hectic
y44	Others feeling that they have enough time and money for the things that are most
y45	Others' financial security
y46	Others' material standard of living
y47	Others' ability to dream and pursue their dreams
y48	Others' ability to use their imaginations and be creative
y49	Others having many moments in their lives when they feel inspired
y50	How much beauty others experience in their lives
y51	The amount of pleasure in others' lives
y52	The amount of fun and play in others' lives
y53	Others having new things, adventure, and excitement in their lives
y54	Others' sense of discovery and wonder
y55	Others feeling that they understand the world and the things going on around them
y56	Others' knowledge, skills, and access to information
y57	How often others are able to challenge their minds in a

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Table A.6 – *Continued from previous page*

<b>List Type</b>	<b>Aspect</b>
	productive or enjoyable way.
y58	How interesting, fascinating, and free of boredom others' lives are
y59	Others' ability to be themselves and express themselves
y60	Others' personal growth
y61	Others being the people they want to be
y62	Others' ability to fulfill their potential
y63	Others' sense of purpose
y64	Others' feeling that their lives have direction
y65	Others' sense of control over their lives
y66	Others' sense that their lives are meaningful and have value
y67	Others' sense that they are making a difference, actively contributing to the well-being of others
y68	The overall quality of others' experience at work
y69	How often others become deeply engaged in their daily activities
y70	Others' feeling of independence and self-sufficiency
y71	Others' sense that they are competent and capable in the activities that matters to them
y72	Others' ability to shape and influence the things around them
y73	Others' sense of achievement and excellence
y74	Others' enjoyment of winning, competing, and facing challenges
y75	Others' success at accomplishing their goals
y76	Others' chances to live long lives
y77	Others' health
y78	Others' mental health and emotional stability
y79	Others' absence of internal conflict (conflict within a person)
y80	Others' ability to fully experience the entire range of healthy human emotions
y81	Others feeling alive and full of energy
y82	Others' passion and enthusiasm about things in their lives

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Table A.6 – *Continued from previous page*

<b>List Type</b>	<b>Aspect</b>
y83	Others? pride and respect for themselves
y84	Others having the people around them think well of them and treat them with dign
y85	Others having a role to play in society
y86	How much love there is in others? lives
y87	The quality of others? romantic relationships, marriage, love life or sex life
y88	Others? ability to have and raise children
y89	The quality of others? family relationships
y90	The happiness of others? families
y91	Others? sense of community, belonging, and connection with other people
y92	Others having people around them who share their values, beliefs and interests
y93	Others having people they can turn to in time of need
y94	Others not being lonely
y95	Others feeling that they are understood
y96	Others? opportunities to participate in ceremonies, cultural events, and celebrations
y97	Others? freedom from being lied to, deceived, or betrayed
y98	Others? freedom from emotional abuse or harassment
y99	The absence of humiliation and embarrassment in others' lives
y100	The absence of shame and guilt in others? lives
y101	Others' sense that everything happens for a reason
y102	Others' sense of connection with the universe or the power behind the universe
y103	Others being good, moral people and living according to their personal values
y104	Others feeling that they are part of something bigger than themselves
y105	Others' sense that they are standing up for what they believe in
y106	Others' sense that they know what to do when they face choices in their lives

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Table A.6 – *Continued from previous page*

<b>List Type</b>	<b>Aspect</b>
y107	Others' ability to 'be in the moment'
y108	Others' ability to keep good perspective in their lives
y109	Others' home is free of domestic violence
y110	Others' home is free of addictions
y111	Others' neighborhood is safe ( i.e no thieves, extortion, smuggling, kidnapping)
y112	Others' feel safe in their neighborhood
y113	Others' neighborhoods are free of drug violence ( i.e murders by drug gangs, shooting, narcobloqueos, public hanging of corpses, beheading)
y114	Others' neighborhood is free of drug trafficking
y115	Other's neighborhood there is not presence of drug trafficking organizations.

Table A.7: Aspects 1–115, 121–150 :Applied to Everyone (everyone-aspects)

<b>List Type</b>	<b>Aspect</b>
z1	How satisfied are people with their lives
z2	People’s ratings of their lives on a ladder where the lowest rung is worst possible scenario
z3	How close people’s lives are to being ideal
z4	The overall well-being of people and their families
z5	People feeling that things are going well for them
z6	People getting the things they want out of life
z7	The extent to which people feel the things they do in their lives are worthwhile
z8	How fulfilling people’s lives are
z9	How rewarding the activities in people’s lives are
z10	people having a beautiful life story, or a life that is ‘like a work of art’
z11	How full of beautiful memories people’s lives are
z12	How grateful people feel for the things in their lives
z13	How much people appreciate their lives
z14	The absence of regret people feel about their lives
z15	How desirable people’s lives are
z16	How glad people are to have the lives they have rather than different lives
z17	The extent to which people ‘have a good life’
z18	How much people like their lives
z19	People feeling that they have been fortunate in their lives
z20	People’s sense of optimism about their future
z21	People having many options and possibilities in their lives and the freedom to choose among them
z22	People’s sense that things are getting better and better
z23	How happy people feel
z24	How much of the time people feel happy
z25	How often people smile or laugh
z26	How much people enjoy their lives
z27	The absence of sadness in people’s lives
z28	People not feeling depressed

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Table A.7 – *Continued from previous page*

<b>List Type</b>	<b>Aspect</b>
z29	The absence of anger in people's lives
z30	The absence of frustration in people's lives
z31	The absence of fear in people's lives
z32	People not feeling anxious
z33	The absence of stress in people's lives
z34	The absence of worry in people's lives
z35	The quality of people's sleep
z36	People's physical safety and security
z37	The amount of order and stability in people's lives
z38	People's sense of security about life and the future in general
z39	People's physical comfort
z40	People's freedom from pain
z41	How easy and free of annoyances people's lives are
z42	How peaceful, calm, and harmonious people's lives are
z43	How often people can feel relaxed instead of feeling their lives are hectic
z44	People feeling that they have enough time and money for the things that are most
z45	People's financial security
z46	People's material standard of living
z47	People's ability to dream and pursue their dreams
z48	People's ability to use their imaginations and be creative
z49	People having many moments in their lives when they feel inspired
z50	How much beauty people experience in their lives
z51	The amount of pleasure in people's lives
z52	The amount of fun and play in people's lives
z53	People having new things, adventure, and excitement in their lives
z54	People's sense of discovery and wonder
z55	People feeling that they understand the world and the things going on around the
z56	People's knowledge, skills, and access to information
z57	How often people are able to challenge their minds in a

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Table A.7 – *Continued from previous page*

<b>List Type</b>	<b>Aspect</b>
	productive or enjoyable
z58	How interesting, fascinating, and free of boredom people's lives are
z59	People's ability to be themselves and express themselves
z60	People's personal growth
z61	People 'being the people they want to be'
z62	People's ability to fulfill their potential
z63	People's sense of purpose
z64	People feeling that their lives have direction
z65	People's sense of control over their lives
z66	People's sense that their lives are meaningful and have value
z67	People's sense that they are making a difference, actively contributing to the well-being of other people, and making the world a better place
z68	The overall quality of people's experience at work
z69	How often people become deeply engaged in their daily activities.
z70	People's feeling of independence and self-sufficiency
z71	People's sense that they are competent and capable in the activities that matter to them
z72	People's ability to shape and influence the things around them
z73	People's sense of achievement and excellence
z74	People's enjoyment of winning, competing, and facing challenges
z75	People's success at accomplishing their goals
z76	People's chances to live long lives
z77	People's health
z78	People's mental health and emotional stability
z79	People's absence of internal conflict (conflict within a person)
z80	People's ability to fully experience the entire range of healthy human emotions
z81	People feeling alive and full of energy
z82	People's passion and enthusiasm about things in their lives

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Table A.7 – *Continued from previous page*

<b>List Type</b>	<b>Aspect</b>
z83	People's pride and respect for themselves
z84	People having the people around them think well of them and treat them with dignity
z85	People having a role to play in society
z86	How much love there is in people's lives
z87	The quality of people's romantic relationships, marriage, love life or sex life
z88	People's ability to have and raise children
z89	The quality of people's family relationships
z90	The happiness of people's families
z91	People's sense of community, belonging, and connection with other people
z92	People having people around them who share their values, beliefs and interests
z93	People having people they can turn to in time of need
z94	People not being lonely
z95	People feeling that they are understood
z96	People's opportunities to participate in ceremonies, cultural events, and celebrations
z97	People's freedom from being lied to, deceived, or betrayed
z98	People's freedom from emotional abuse or harassment
z99	The absence of humiliation and embarrassment in people's lives
z100	The absence of shame and guilt in people's lives
z101	People's sense that everything happens for a reason
z102	People's sense of connection with the universe or the power behind the universe
z103	People being good, moral people and living according to their personal values
z104	People feeling that they are part of something bigger than themselves
z105	People's sense that they are standing up for what they believe in
z106	People's sense that they know what to do when they face choices in their lives

*Continued on next page*

Table A.7 – *Continued from previous page*

<b>List Type</b>	<b>Aspect</b>
z107	People's ability to 'be in the moment'
z108	People's ability to keep good perspective in their lives
z109	People's home is free of domestic violence
z110	People's home is free of addictions
z111	People's neighborhood is safe ( i.e no thieves, extortion, smuggling, kidnapping or murders)
z112	People feel safe in their neighborhood
z113	People's neighborhood is free of drug violence ( i.e murders by drug gangs, shootings, narcobloqueos, public hanging of corpses, beheadings)
z114	People's neighborhood is free of drug trafficking
z115	In other people's neighborhood there is not presence of drug trafficking organizations
Z121	The morality, ethics, and goodness of other people in your nation (BHKS)
Z122	The well-being of the people in your nation (LU, RS)
Z123	Your nation being a just society (MS, SN, GBF)
Z124	The extent to which your nation does things worthy of pride (BHKS, BD)
Z125	The amount of freedom in society (G)
Z126	Freedom of speech and people's ability to take part in the political process and community life (SN, SSF, Q, DG, AHC, RW)
Z127	Freedom of conscience and belief in your nation (SN, Q, RW)
Z128	Equality of income in your nation (BC)
Z129	Equality of opportunity in your nation (SN, Q, G, RW)
Z130	Society helping the poor and others who struggle (BHKS)
Z131	People getting the rewards and punishments they deserve (BBM)
Z132	The amount of order and stability in society (BHKS, BD)
Z133	Freedom from corruption, injustice, and abuse of power in your nation (G)
Z134	Trust among the people in your nation (DS, R)
Z135	The total size of your nation's economy (GDP) (Obj)
Z136	The average income of people in your nation (GDP per capita) (Obj)
Z137	The rate of economic growth (GDP growth) over time in your

*Continued on next page*

Table A.7 – *Continued from previous page*

<b>List Type</b>	<b>Aspect</b>
	nation (Obj)
Z138	How low the rate of unemployment is in your nation (Obj)
Z139	How low the rate of inflation is in your nation's economy (Obj)
Z140	How low the rate of domestic violence is in your nation
Z141	How low the rate of home free of addictions is in your nation
Z142	How low the rate of criminality is in your town ( i.e no thieves , extortion, smuggling, kidnapping or murders) (FP-Obj)
Z143	How low the rate of drug violence is in your town ( i.e murders by drug gangs, smuggling) (FP-Obj)
Z144	How low the rate of drug trafficking is in your town (FP-Obj)
Z145	The reduce number of drug trafficking organizations in Mexico (FP-Obj)
Z146	The efficiency of the local government of your town to provide basic public services (FP-Obj)
Z147	The efficiency of the Federal Government of your nation to solve socioeconomic problems (FP-Obj)
Z148	The morality, ethics, and goodness of people who works for the safety of your town or neighborhood (FP-Obj)
Z149	The general confidence in local institutions in your nation (FP-Obj)
Z150	The coherent plan of the local government in your nation to take care people's need (FP-Obj)

Figure A.1: Personal and Policy Vote Scenarios Screens

Imagine you are **making a personal decision**, and you face a choice between two options: Option 1 and Option 2. The two options are predicted to have different effects over the next six years but to have the same effect after that. The table below lists these predicted differences in the next six years. Please assume that anything not listed in the table would be marked "about equal" if it were listed.

[Click here to see the instructions again](#)

	Option 1			about equal	Option 2		
	much higher	somewhat higher	slightly higher		slightly higher	somewhat higher	much higher
how happy <b>you</b> feel			X				
the absence of stress in <b>your</b> life	X						
<b>your</b> physical safety and security				X			
<b>your</b> social status					X		
<b>your</b> financial security				X			
<b>your</b> health						X	

Between these two options which do you think you would choose?

	Option 1			about equal	Option 2		
	Much Prefer Option 1	Somewhat Prefer Option 1	Slightly Prefer Option 1	Slightly Prefer Option 2	Somewhat Prefer Option 2	Much Prefer Option 2	
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

Imagine you are **making a decision between two public policies**, and you face a choice between two options: Option 1 and Option 2. The two options are predicted to have different effects over the next six years but to have the same effect after that. The table below lists these predicted differences in the next six years. Please assume that anything not listed in the table would be marked "about equal" if it were listed.

[Click here to see the instructions again](#)

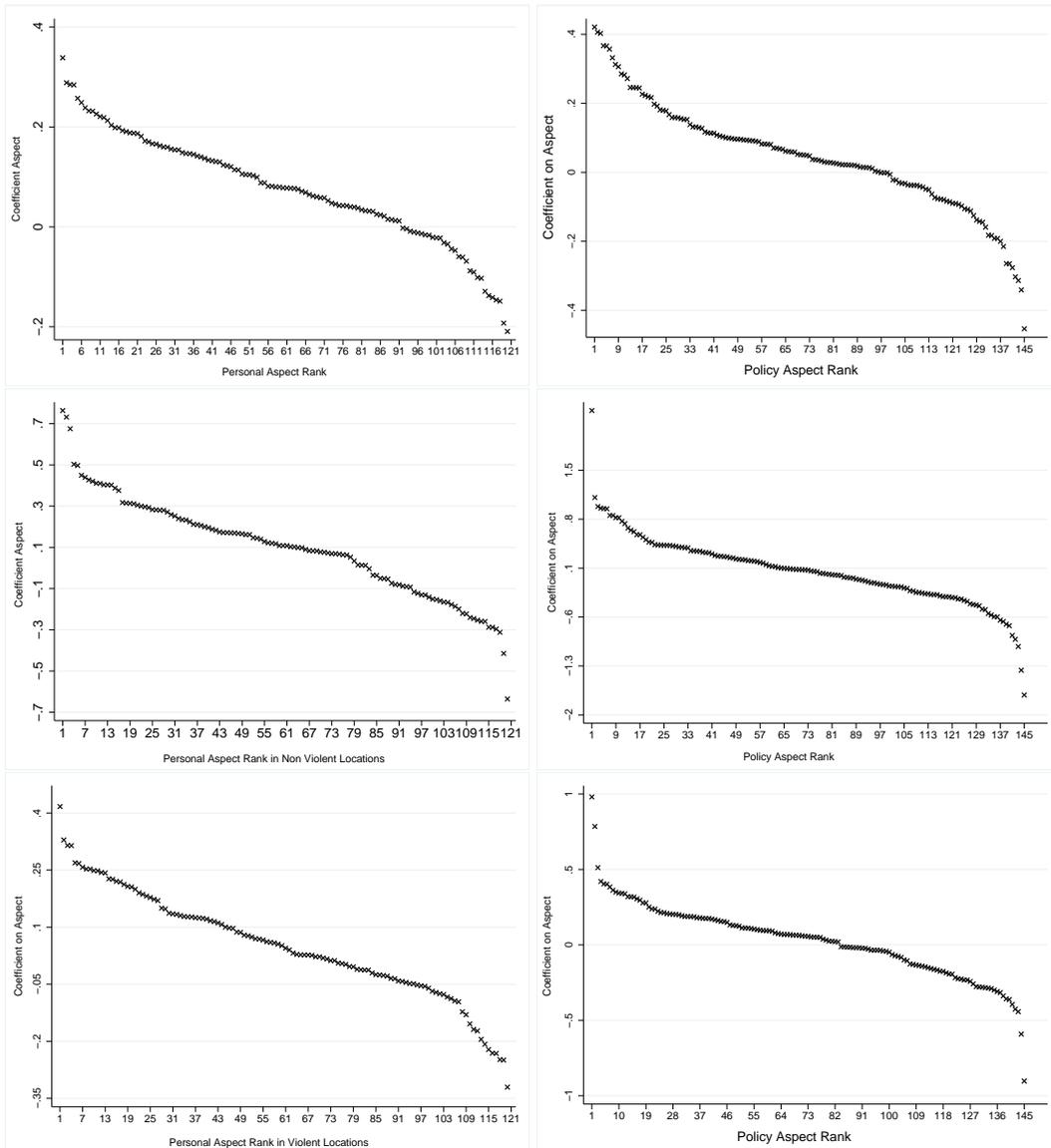
	Option 1			about equal	Option 2		
	much higher	somewhat higher	slightly higher		slightly higher	somewhat higher	much higher
<b>people's</b> helth				X			
the reduce number of drug trafficking in <b>your</b> neighborhood	X						
equality of opportunity in <b>Mexico</b>		X					
<b>people's</b> neighborhood is safe							X
<b>people's</b> financial security				X			
The absence of fear in <b>people's</b> lives						X	

Between these two options which do you think you would choose?

	Option 1			about equal	Option 2		
	Much Prefer Option 1	Somewhat Prefer Option 1	Slightly Prefer Option 1	Slightly Prefer Option 2	Somewhat Prefer Option 2	Much Prefer Option 2	
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

Note: This version of the screens consider 6-8 aspect per scenario and are modified from Benjamin et al.(2014, p4)

Figure A.2: Relative Marginal Utilities for Personal and Policy Scenarios



Note: Aspect coefficients by rank from OLS regressions, separately for 120 personal scenarios and 145 policy-scenario aspects in violent and non-violent locations.

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APPENDIX B  
CHAPTER 2 OF APPENDIX

**Theoretical Framework: Log Linear Models for Contingency Tables**

This section resumes the mathematical models used in this paper and are analyzed on Agresti (2002, p314-315)<sup>1</sup>: “ Loglinear models are used as generalized linear models (GLMs) using the log link function with a Poisson response. A common use is modeling cell counts in contingency tables. The models specify how the expected count depends on levels of the categorical variables for that cell as well as associations and interactions among those variables. Let assume the case of a Two way Tables: Consider an  $IXJ$  contingency table that cross-classifies a multinomial sample of  $n$  subjects on two categorical responses. The cell probabilities are  $\pi$  and the expected frequencies are  $\mu_{ij}$ . Log linear models formulas uses  $\mu_{ij}$  rather than  $\pi_{ij}$  so they also apply with Poisson sampling for  $N=IJ$  independence cells counts  $Y_{ij}$  having  $\mu_{ij}=E(Y_{ij})$ . In either case the observed cell counts is denoted by  $n_{ij}$ . Under statistical independence, the  $\mu_{ij}$  have the structure:

$$\mu_{ij} = \mu\alpha_i\beta_j \tag{B.0.0.1}$$

For multinomial sampling,  $v_{ij}=n\pi_{+i}\pi_{+j}$ . Denote the row variable by  $X$  and the column variable by  $Y$ . The formula expressing independence is multiplicative, log  $\mu_{ij}$  has additive form:

$$\log\mu_{ij} = \lambda + \lambda_i^X + \lambda_j^Y \tag{B.0.0.2}$$

For row effect  $\lambda_i^X$  and column effect  $\lambda_j^Y$ . This is the loglinear model of independence. As usual, identifiability requieres constraints such as  $\lambda_i^X=\lambda_j^Y=0$ . The Maximum Likelihood (ML) requires that  $\hat{\mu}_{ij}=n_{i+}n_{+j}/n$ ”

**Interpretation of Parameters**

Agresti(2002, p315): “Loglinear models for contingency tables are GLMs that treat the N cell counts as independent observations of a Poisson random component.

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<sup>1</sup>Agresti, A., 2002. Categorical Data Analysis. Wiley Interscience, Hoboken

Loglinear GLMs identify the data as the N cell counts rather than the individual classifications of the n subjects. The expected cell counts link to the explanatory terms using the log link. As in equation (B.0.2) illustrates, of the cross-classified variables, the model does not distinguish between response and explanatory variables. It treats both jointly as responses, modeling  $\mu_{ij}$  for combinations of their levels. To interpret parameters, however, it is helpful to treat the variables asymmetrically. Following Agresti (2002,p380), the case of independence model for IX2 tables. In row  $i$ , the logit equals:

$$\begin{aligned}
 \text{logit}[P(Y = 1 | X = i)] &= \log \frac{P(Y = 1 | X = i)}{P(Y = 2 | X = i)} \\
 &= \log \frac{\mu_{i1}}{\mu_{i2}} = \log \mu_{i1} - \log \mu_{i2} \\
 &= (\lambda + \lambda_i^X + \lambda_1^Y) - (\lambda + \lambda_i^X + \lambda_2^Y) \\
 &= \lambda_1^X + \lambda_2^Y
 \end{aligned} \tag{B.0.0.3}$$

The final term does not depend on  $i$ ; that is,  $\text{logit}[P(Y=1, | X=i)]$  is identical at each level of  $X$ . Thus independence implies a model of form,  $\text{logit}[P(Y=1 | X=i)]=\alpha$ . In each row, the odds of response in column 1 equals  $\exp(\alpha)=\exp(\lambda_1^Y-\lambda_2^Y)$ . An analogous property holds when  $J>2$ . Differences between two parameters for a given variable relate to the log odds of making one response, relative to the other, on that variable.”

### Saturated Model

Agresti (2002, p316): “Statistically dependent variables satisfy a more complex loglinear model,

$$\log \mu_{ij} = \lambda + \lambda_i^X + \lambda_j^Y + \lambda_{ij}^{XY} \tag{B.0.0.4}$$

The  $\lambda_{ij}^X$  are association terms that reflect deviations from independence. The  $\mu_{ij}$  represents interactions between  $X$  and  $Y$ , whereby the effect of one variable on  $\mu_{ij}$  depends on the level of the other. The independence model results when all  $\lambda_{ij}^{XY}=0$ . With constraints  $\lambda_I^X=\lambda_J^Y=0$  in (B.0.3) and (B.0.4),  $\lambda_i^X$  and  $\lambda_j^Y$  are equivalent, coefficients of dummy variables for the first  $(I-1)$  categories of  $X$  and the first  $(J-1)$  categories of  $Y$ . Thus  $\lambda_{ij}^{XY}$  is the coefficient of the product of two dummy variables

for  $\lambda_{ij}^{XY} = \lambda_{ji}^{XY} = 0$ , and only  $(I-1)(J-1)$  of these parameters are nonredundant. Test of independence analyze whether these  $(I-1)(J-1)$  parameters equal zero, so they have residual  $df=(I-1)(J-1)$ . The number of parameters in model (B.0.4) equals  $1+(I-1)+(J-1)+(I-1)(J-1)=IJ$ , the number of cells. This model describes any  $\mu_{ij}>0$ . The direct relationship in this two way contingency tables between log odd ratios  $\lambda_{ij}^{XY}$ :

$$\begin{aligned} \log\theta &= \log \frac{\mu_{11}\mu_{22}}{\mu_{21}\mu_{12}} = \log\mu_{11} - \log\mu_{22} - \log\mu_{12} - \log\mu_{21} \\ &= (\lambda + \lambda_1^X + \lambda_1^Y + \lambda_{11}^{XY}) + \\ &\quad (\lambda + \lambda_2^X + \lambda_2^Y + \lambda_{22}^{XY}) \\ &\quad - (\lambda + \lambda_1^X + \lambda_2^Y + \lambda_{12}^{XY}) - (\lambda + \lambda_2^X + \lambda_1^Y + \lambda_{21}^{XY}) \end{aligned} \tag{B.0.0.5}$$

Thus  $\lambda_{ij}$  determined the association, as with the independence model, the parameter constraints for the saturated model are arbitrary. Instead of setting all  $\lambda_{ij} = \lambda_{ij} = 0$ , one could set  $\sum_i \lambda_{ij}^{XY} = \sum_j \lambda_{ij}^{XY} = 0$  for all  $i$  and  $j$ . Conditional on the sum  $n$  of the cells counts, Poisson loglinear models for  $\mu_{ij}$  become multinomial models for cell probabilities  $\pi_{ij} = \mu_{ij} / \sum \mu_{ab}$ . For the saturated model:

$$\pi_{ij} = \frac{\exp(\lambda + \lambda_i^X + \lambda_j^Y + \lambda_{ij}^{XY})}{\sum_a \sum_b \exp(\lambda + \lambda_a^X + \lambda_b^Y + \lambda_{ab}^{XY})} \tag{B.0.0.6}$$

This representation implies the usual constraints for probabilities,  $\pi_{ij} \geq 0$  and  $\sum_i \sum_j \pi_{ij} = 1$ .

### LogLinear Models for Independence and Interaction in Three-Way Tables

Agresti (2002): "A three-way  $IXJK$  cross-classification of response variables  $X, Y$  and  $Z$  has several potential types of independence. We assume a multinomial distribution with cells  $\pi_{ijk}$  and  $\sum_i \sum_j \sum_k \pi_{ijk} = 1$ . The three variables are mutually independent when:

$$\pi_{ijk} = \pi_{i++} \pi_{+j+} \pi_{++k} \text{ for all } i, j, k. \tag{B.0.0.7}$$

For expected frequency  $\mu_{ijk}$  mutual independence has loglinear form:

$$\log \mu_{ijk} = \lambda + \lambda_i^X + \lambda_j^Y + \lambda_k^Z \quad (\text{B.0.0.8})$$

variable Y is jointly independent of X and Z when:

$$\pi_{ijk} = \pi_{i+k}\pi_{+j+} \text{ for all } i, j, k. \quad (\text{B.0.0.9})$$

This ordinary two way independence between Y and a variable composed of the IK combinations of levels of X and Z the loglinear is:

$$\log \mu_{ijk} = \lambda + \lambda_i^X + \lambda_j^Y + \lambda_k^Z + \lambda_{ik}^{XZ} \quad (\text{B.0.0.10})$$

Similarly, X could be jointly independent of Y and Z, or Z could be jointly independent of X and Y. Mutual independence implies joint independence of any variable from the others. X and Y are conditionally independent, given Z when independence holds for each partial table within which Z is fixed. If  $\pi_{i|jk} = P(X=i, Y=j | Z=k)$ , then  $\pi_{i|jk} = \pi_{i+|k}\pi_{+j|k}$  for all i,j,k. For joint probabilities over the entire table, equivalently:

$$\pi_{ijk} = \pi_{i+k}\pi_{+jk}/\pi_{++k} \text{ for all } i, j, k. \quad (\text{B.0.0.11})$$

Conditional independence of X and Y, given Z, is the loglinear model

$$\log \mu_{ijk} = \lambda + \lambda_i^X + \lambda_j^Y + \lambda_k^Z + \lambda_{ik}^{XZ} + \lambda_{jk}^{YZ} \quad (\text{B.0.0.12})$$

Which is a weaker condition than mutual or joint independence. Log linear models (B.0.7),

(B.0.9),(B.0.10) have three, two and one pair of conditionally independent variables, respectively. The terms  $\lambda_{ij}^{XY}$  pertain to conditionally independent variables. A model that permits all three pairs to be conditionally dependent is:

$$\log \mu_{ijk} = \lambda + \lambda_i^X + \lambda_j^Y + \lambda_k^Z + \lambda_{ij}^{XY} + \lambda_{jk}^{XZ} + \lambda_{ik}^{XZ} + \lambda_{jk}^{YZ} \quad (\text{B.0.0.13})$$

From exponentiating both sides, the cell probabilities have form:  $\pi_{ijk} = \psi_{ij} \phi_{jk} \omega_{ik}$ . For an specific case, an *homogeneous association* model:

$$\log \mu_{ijk} = \lambda + \lambda_i^X + \lambda_j^Y + \lambda_k^Z + \lambda_{ij}^{XY} + \lambda_{ik}^{XZ} + \lambda_{jk}^{YZ} + \lambda_{ijk}^{XYZ} \quad (\text{B.0.0.14})$$

With dummy variables  $\lambda_{ijk}^{XYZ}$  is the coefficient of the product of the *i*th dummy variable for X, *j*th dummy for Y and, *k*th dummy variable for Z. The total number of non-redundant parameters is:  $1+(I-1)+(J-1)+(K-1)+(I-1)(J-1)+(I-1)(K-1)+(J-1)(K-1)+(I-1)(J-1)(K-1)=IJK$ , which is the total number of the total number of cell counts. This model has as many parameters as observations and is saturated. It describes all possible positive  $\mu_{ijk}$ . Each pair of variables may be conditionally dependent, and an odds ratio for any pair may vary across categories of the third variable. Setting certain parameters equal to zero in (B.0.13) yields the models introduced previously.”(p.316)

### Interpreting Model Parameters

Agresti (2002,p321-322): “Interpretations of loglinear model parameters use their highest-order terms. For instance, interpretations for model B.0.12 use the two-factor terms to describe conditional odds ratios. At a fixed level *k* of Z, the conditional association between X and Y uses (I-1)(J-1) odd ratios, such a the local odd ratios:

$$\theta_{ij(k)} = \frac{\pi_{ijk}\pi_{i+1,j+1,k}}{\pi_{ij+1,k}\pi_{i+1,j+1,k}}, \quad 1 \leq i \leq I-1, 1 \leq j \leq J-1. \quad (\text{B.0.0.15})$$

Similarly, (I-1)(K-1) odds ratios  $\theta_{i(j)k}$  describe XY conditional association and (J-1)(K-1) odds ratios  $\theta_{(i)jk}$  describe YZ conditional association. Loglinear models have characterizations using constraints on conditional odd ratios. For instance, conditional independence of X and Y is equivalent to  $\theta_{ij(k)}=1$ ,  $i=1,\dots,I$ ,  $j=1,\dots,J$ ,  $k=1,\dots,K$ . The two factor parameters relate directly to the conditional odd ratios. To illustrate, substituting (7.0.12) for model (XY,XZ,YZ) into  $\log \theta_{ij(k)}$  yields:

$$\begin{aligned}\theta_{ij(k)} &= \frac{\mu_{ijk}\mu_{i+1,j+1,k}}{\mu_{i+1,jk}\mu_{1,j+1,k}} \\ &= \lambda_{ij}^{XY} + \lambda_{i+1,j+1}^{XY} - \lambda_{i,j+1}^{XY} - \lambda_{i+1,j}^{XY}\end{aligned}\tag{B.0.0.16}$$

Since the right-hand side is the same for all k, an absence of three-factor interaction is equivalent to

$$\theta_{ij(1)} = \theta_{ij(2)} = \dots = \theta_{ij(K)} \text{ for all } i \text{ and } j.\tag{B.0.0.17}$$

The same argument for the other conditional odds ratios shows that model XY, XZ, YZ. is also equivalent to:  $\theta_{i(1)k} = \theta_{i(2)k} = \dots = \theta_{i(J)k}$  for all i and k, also for  $\theta_{(1)jk} = \theta_{(2)jk} = \dots = \theta_{(I)jk}$  for all j and k. Any model not having the three-factor interaction term has a homogeneous association for each pair of variables. When X and Y have two categories, only one nonredundant  $\lambda_{ij}^{XY}$  parameters occurs. The  $\lambda_{ij}^{XYZ}$  occurs.refers to three-factor interactions. It describes how the odds ratio between two variables changes across categories of the third. We illustrate for 2x2x2 tables. By direct substitution of the general model formula,

$$\begin{aligned}\log \frac{\theta_{11(1)}}{\theta_{11(2)}} &= \log \frac{(\mu_{111}\mu_{221})/(\mu_{121}\mu_{211})}{(\mu_{112}\mu_{222})/(\mu_{122}\mu_{212})} \\ &= (\lambda_{111}^{221} + \lambda_{221}^{XYZ} - \lambda_{121}^{XYZ} - \lambda_{211}^{XYZ}) \\ &\quad - (\lambda_{112}^{XYZ} + \lambda_{222}^{XYZ} - \lambda_{122}^{XYZ} - \lambda_{212}^{XYZ})\end{aligned}\tag{B.0.0.18}$$

Only one parametric is nonredundant. For constraints setting the second-category parameters equal to 0, this log ratio of odds ratios equals  $\lambda_{111}^{XYZ}$ . When  $\lambda_{111}^{XYZ}=0$ ,  $\theta_{11(1)}=\theta_{11(2)}$ , giving homogeneous XY association. "(p321-322)

### Association Models

Agresti (2002, p369): "For two -way tables, a simple model for two ordinal variables assigns ordered row scores  $\mu_1 \leq \mu_2 \leq \dots \leq \mu_I$  and column scores  $\nu_1 \leq \nu_2 \leq \dots \leq \nu_J$ . The model is

$$\log \mu_{ij} = \lambda + \lambda_i^X + \lambda_j^Y + \beta \mu_i \nu_j\tag{B.0.0.19}$$

with constraints such as  $\lambda_i^X = \lambda_j^Y = 0$ . This is the special case of the saturated model in which  $\lambda_{ij}^{XY} = \beta \mu_i \nu_j$ . It requires one parameter to describe association, the saturated model requires (I-1)(J-1). Independence occurs when  $\beta = 0$ . The term  $\beta \mu_i \nu_j$  represents the deviations of  $\log \mu_{ij}$  from independence. The deviations is linear in the Y scores at fixed level of X and linear in the X scores at fixed level of Y. In column j, for instance, the deviations is linear function of X, having form (slope)x(slope for X), with slope  $\beta \mu_j$ . This property is called the linear-by-linear association model (LXL). When  $\beta > 0$ , Y tends to increase as X increases. Expected frequencies are larger than expected in cells where X and Y are both high or both low. When  $\beta < 0$ , Y tends to decrease as X increases. When the data display a positive or negative trend, the LXL model usually fits much better than the independent model. For the 2x2 table using the cells intersecting rows a and c with columns b and d, direct substitution shows that the model has:

$$\log \frac{\mu_{ab}\mu_{cd}}{\mu_{ad}\mu_{cb}} = \beta(u_c - u_a)(v_d - v_b) \quad (\text{B.0.0.20})$$

This log odds ratio is stronger as  $|\beta|$  increases and for pairs of categories that are farther apart. Simple interpretations result when  $\mu_2 - \mu_1 = \dots = \mu_I - \mu_{I-1}$  and  $v_2 - v_1 = \dots = v_J - v_{J-1}$ . When  $\mu_i = i$  and  $\nu_j = j$ , for instance the local ratios for adjacent rows and columns have common value  $\epsilon_\beta$ . Goldman(1979a) called this case *uniform association*."p.369

Agresti(2002,p374): "Generalizations of the linear-by-linear association model apply to multiway tables are called association models. By considering X as nominal and Y as ordinal, it is appropriate for two-way tables with ordered columns, using scores  $\nu_1 \leq \nu_2 \leq \dots \leq \nu_J$ . Since the rows are unordered they don't have scores. Replacing the ordered values  $\beta_{\nu_i}$  in the linear-by-linear term  $\beta \nu_i \mu_j$  by unordered parameters  $\nu_i$  gives:

$$\log \nu_{ij} = \lambda + \lambda_i^X + \lambda_j^Y + \mu_i \nu_j \quad (\text{B.0.0.21})$$

Constraints are needed such as  $\lambda_i^X = \lambda_j^Y = \mu_i = 0$ . The  $\mu_i$  are called row effects and it is called *row effects model*. This model has I-1 more parameters (the  $\mu_i$ ) than the independence model. Independence is the special case  $\mu_i = \dots = \mu_I$ . A corresponding *column effect model* has association term  $\mu_i \nu_j$ . It treats X as ordinal with scores  $\nu_i$  and Y as nominal with parameters  $\mu_j$ . The row effects and column effects models were developed by Goodman (1979a), Haberman(1974b) and Simon(1974)."p374

Table B.1: Network Structure Models for Residents in Non-violent Locations and High Self Reported Level of Happiness

General Model #	Name	Diagonal	Distance	$L^2$	df	P-value	$\chi^2$	$\chi^2df$	$\chi^2Sig.$	Comp.model	
Stage 1	1	Constant	Unconstrained	-	1309.16	230	0.000	NA	NA	NA	NA
	2	Differential	Unconstrained	-	632.0	229	0.000	667	1	0.0001	1
	3	Homogeneous	-	Unconstrained	3997.11	221	0.000	NA	NA	NA	NA
	4	Heterogeneous	-	Unconstrained	3624.12	220	0.000	373	1	0.0001	3
Stage 2-	5	Het/Diff	Constrained	Constrained	305.79	209	0.000	NA	NA	NA	NA
	6	Het/Diff	Unconstrained	Unconstrained	246.40	207	0.0316	59.39	2	0.0001	5
	7	Het/Diff	Xie	Xie	200.46	186	0.2220	45.94	21	0.0013	6
	8	Het/Diff	Constrained	Unconstrained	270.45	208	0.0023	69.99	22	0.0001	7
	9	Het/Diff	Xie	Unconstrained	216.05	196	0.1554	15.59	10	0.1120	7
	10	Het/Diff	Unconstrained	Constrained	270.63	208	0.0023	54.58	12	0.0001	9
	11	Het/Diff	Unconstrained	Xie	224.25	197	0.0889	23.79	11	0.0136	9
	12	Het/Diff	Constrained	Xie	247.13	198	0.0101	31.08	2	0.0001	9
	13	Het/Diff	Xie	Constrained	224.37	197	0.0880	8.32	1	0.0039	9

**Note:** " $\chi^2$ " refers to the  $\chi^2$  value of the likelihood test, " $\chi^2df$ " refers to the degrees of freedom for the test " $\chi^2Sig$ ", indicates the P-value of the test. Comp. Model is the number of the model to which the current model is being compared. A significant test indicates that the model with fewer degrees of freedom is preferred over the model with more degrees of freedom. Selection among the models relies upon the likelihood-ratio test statistic. This test compares the differences in  $L^2$  scores for both models to the  $\chi^2$  distribution with degrees of freedom equal to the difference in df between the models.

Table B.2: Network Structure Models for Residences in Violent Locations and High Self Reported Level of Happiness

General Model #	Name	Diagonal	Distance	$L^2$	df	P-value	$\chi^2$	$\chi^2df$	$\chi^2Sig.$	Comp.model	
Stage 1	1	Constant	Unconstrained	-	227.24	230	0.5389	NA	NA	NA	NA
	2	Differential	Unconstrained	-	677.73	229	0.000	450.49	1	0.0001	1
	3	Homogeneous	-	Unconstrained	3306	221	0.000	NA	NA	NA	NA
	4	Heterogeneous	-	Unconstrained	3298	220	0.000	8	1	0.0047	3
Stage 2-	5	Het/Diff	Constrained	Constrained	268.69	209	0.0034	NA	NA	NA	NA
	6	Het/Diff	Unconstrained	Unconstrained	231.49	207	0.1166	37.02	2	0.0001	5
	7	Het/Diff	Xie	Xie	184.68	186	0.5134	46.81	21	0.7725	6
	8	Het/Diff	Constrained	Unconstrained	264.41	208	0.0049	79.73	22	0.0001	7
	9	Het/Diff	Xie	Unconstrained	209.62	196	0.2399	24.04	12	0.0201	7
	10	Het/Diff	Unconstrained	Constrained	232.69	208	0.1154	48.01	22	0.0011	7
	11	Het/Diff	Unconstrained	Xie	201.33	197	0.4012	16.65	11	0.1187	7
	12	Het/Diff	Constrained	Xie	229.84	198	0.0600	28.51	1	0.0001	11
	13	Het/Diff	Xie	Constrained	219.96	197	0.1255	12.73	0	0	11

**Note:** " $\chi^2$ " refers to the  $\chi^2$  value of the likelihood test, " $\chi^2df$ " refers to the degrees of freedom for the test " $\chi^2Sig$ ", indicates the P-value of the test. Comp. Model is the number of the model to which the current model is being compared. A significant test indicates that the model with fewer degrees of freedom is preferred over the model with more degrees of freedom. Selection among the models relies upon the likelihood-ratio test statistic. This test compares the differences in  $L^2$  scores for both models to the  $\chi^2$  distribution with degrees of freedom equal to the difference in df between the models.

Table B.3: Network Structure Models for Residences of Non-violent Locations and Low Self Reported Level of Happiness

General Model #	Name	Diagonal	Distance	$L^2$	df	P-value	$\chi^2$	$\chi^2$ df	$\chi^2$ Sig.	Comp.model
Stage 1	1 Constant	Unconstrained	-	1080.43	230	0.000	NA	NA	NA	NA
	2 Differential	Unconstrained	-	198.21	229	0.9302	53.33	1	0.0001	1
	3 Homogeneous	-	Unconstrained	446.48	221	0.000	NA	NA	NA	NA
	4 Heterogeneous	-	Unconstrained	440.40	220	0.000	6.08	1	0.0137	3
Stage 2-	5 Het/Diff	Constrained	Constrained	117.12	209	1.000	NA	NA	NA	NA
	6 Het/Diff	Unconstrained	Unconstrained	100.17	207	1.000	16.94	2	0.0002	5
	7 Het/Diff	Xie	Xie	84.22	186	1.000	15.95	21	0.7725	6
	8 Het/Diff	Constrained	Unconstrained	110.45	208	1.000	26.23	22	0.0001	7
	9 Het/Diff	Xie	Unconstrained	89.75	196	1.000	5.53	10	0.8531	7
	10 Het/Diff	Unconstrained	Constrained	107.19	208	1.000	17.44	12	0.1338	9
	11 Het/Diff	Unconstrained	Xie	97.37	197	1.000	7.62	1	0.0058	9
	12 Het/Diff	Constrained	Xie	107.97	198	1.000	18.22	2	0.0001	9
	13 Het/Diff	Xie	Constrained	95.89	197	1.000	6.14	1	0.0132	9

**Note:** " $\chi^2$ " refers to the  $\chi^2$  value of the likelihood test, " $\chi^2$ df" refers to the degrees of freedom for the test " $\chi^2$ Sig", indicates the P-value of the test. Comp. Model is the number of the model to which the current model is being compared. A significant test indicates that the model with fewer degrees of freedom is preferred over the model with more degrees of freedom. Selection among the models relies upon the likelihood-ratio test statistic. This test compares the differences in  $l^2$  scores for both models to the  $\chi^2$  distribution with degrees of freedom equal to the difference in df between the models.

Table B.4: General Network Structure Models for Residences in Violent Locations and Low Self Reported Level of Happiness

General Model #	Name	Diagonal	Distance	$L^2$	df	P-value	$\chi^2$	$\chi^2$ df	$\chi^2$ Sig.	Comp.model
Stage 1	1 Constant	Unconstrained	-	218.51	230	0.5389	NA	NA	NA	NA
	2 Differential	Unconstrained	-	208.26	229	0.8335	10.25	1	0.0014	1
	3 Homogeneous	-	Unconstrained	383.75	221	0.000	NA	NA	NA	NA
	4 Heterogeneous	-	Unconstrained	378.56	220	0.000	5.19	1	0.0227	3
Stage 2-	5 Het/Diff	Constrained	Constrained	131.72	209	1.0000	NA	NA	NA	NA
	6 Het/Diff	Unconstrained	Unconstrained	120.33	207	1.000	11.39	2	0.0034	5
	7 Het/Diff	Xie	Xie	94.59	186	1.0000	25.74	21	0.2165	6
	8 Het/Diff	Constrained	Unconstrained	125.02	208	1.0000	30.43	22	0.1084	7
	9 Het/Diff	Xie	Unconstrained	105.20	196	1.0000	10.61	10	0.3887	7
	10 Het/Diff	Unconstrained	Constrained	131.72	208	1.0000	26.52	12	0.0091	9
	11 Het/Diff	Unconstrained	Xie	105.74	197	1.0000	0.054	1	0.8162	9
	12 Het/Diff	Constrained	Xie	109.88	198	1.000	4.68	2	0.0963	9
	13 Het/Diff	Xie	Constrained	115.10	197	1.000	9.9	1	0.0017	9

**Note:** " $\chi^2$ " refers to the  $\chi^2$  value of the likelihood test, " $\chi^2$ df" refers to the degrees of freedom for the test " $\chi^2$ Sig", indicates the P-value of the test. Comp. Model is the number of the model to which the current model is being compared. A significant test indicates that the model with fewer degrees of freedom is preferred over the model with more degrees of freedom. Selection among the models relies upon the likelihood-ratio test statistic. This test compares the differences in  $L^2$  scores for both models to the  $\chi^2$  distribution with degrees of freedom equal to the difference in df between the models.

Table B.5: Network Structure Models: Urban

General Model #	Name	Diagonal	Distance	$L^2$	df	P-value	$\chi^2$	$\chi^2$ df	$\chi^2$ Sig.	Comp.model	
Stage 1	1	Constant	Unconstrained	-	1437.98	230	0.000	NA	NA	NA	NA
	2	Differential	Unconstrained	-	932.66	229	0.000	505.32	1	0.0001	1
	3	Homogeneous	-	Unconstrained	4859.67	221	0.000	NA	NA	NA	NA
	4	Heterogeneous	-	Unconstrained	4844.13	220	0.000	15.54	1	0.0001	3
Stage 2	5	Het/Diff	Constrained	Constrained	322.30	209	0.000	NA	NA	NA	NA
	6	Het/Diff	Unconstrained	Unconstrained	297.42	207	0.000	24.88	2	0.0001	5
	7	Het/Diff	Xie	Xie	187.47	186	0.4560	109.95	21	0.0001	6
	8	Het/Diff	Constrained	Unconstrained	317.28	208	0.000	129.81	22	0.0001	7
	9	Het/Diff	Xie	Unconstrained	213.44	196	0.1868	25.97	10	0.0038	7
	10	Het/Diff	Unconstrained	Constrained	303.52	208	0.000	90.08	12	0.0001	9
	11	Het/Diff	Unconstrained	Xie	257.82	197	0.0023	70.35	11	0.0001	9
	12	Het/Diff	Constrained	Xie	274.08	198	0.0003	60.64	2	0.0001	9
	13	Het/Diff	Xie	Constrained	231.95	197	0.0446	18.51	1	0.0001	9

**Note:** " $\chi^2$ " refers to the  $\chi^2$  value of the likelihood test, " $\chi^2$ df" refers to the degrees of freedom for the test " $\chi^2$ Sig", indicates the P-value of the test. Comp. Model is the number of the model to which the current model is being compared. A significant test indicates that the model with fewer degrees of freedom is preferred over the model with more degrees of freedom. Selection among the models relies upon the likelihood-ratio test statistic. This test compares the differences in  $L^2$  scores for both models to the  $\chi^2$  distribution with degrees of freedom equal to the difference in df between the models.

Table B.6: Network Structure Models: Rural

General Model #	Name	Diagonal	Distance	$L^2$	df	P-value	$\chi^2$	$\chi^2$ df	$\chi^2$ Sig.	Comp.model	
Stage 1	1	Constant	Unconstrained	-	768.37	230	0.0000	NA	NA	NA	NA
	2	Differential	Unconstrained	-	368.16	229	0.0000	400.21	1	0.0001	1
	3	Homogeneous	-	Unconstrained	2040.50	221	0.0000	NA	NA	NA	NA
	4	Heterogeneous	-	Unconstrained	2039.82	220	0.000	0.68	1	0.4096	3
Stage 2	5	Het/Diff	Constrained	Constrained	281.19	209	0.0006	NA	NA	NA	NA
	6	Het/Diff	Unconstrained	Unconstrained	221.48	207	0.2332	59.71	2	0.0001	5
	7	Het/Diff	Xie	Xie	194.55	186	0.3187	26.93	21	0.1732	6
	8	Het/Diff	Constrained	Unconstrained	281.17	208	0.0005	82.62	22	0.0001	7
	9	Het/Diff	Xie	Unconstrained	198.93	196	0.4281	4.38	10	0.9286	7
	10	Het/Diff	Unconstrained	Constrained	222.54	208	0.2329	23.61	12	0.0230	9
	11	Het/Diff	Unconstrained	Xie	214.04	197	0.1925	15.11	1	0.0001	9
	12	Het/Diff	Constrained	Xie	270.86	198	0.0004	71.93	2	0.0001	9
	13	Het/Diff	Xie	Constrained	202.01	197	0.3881	3.08	1	0.0793	9

**Note:** " $\chi^2$ " refers to the  $\chi^2$  value of the likelihood test, " $\chi^2$ df" refers to the degrees of freedom for the test " $\chi^2$ Sig", indicates the P-value of the test. Comp. Model is the number of the model to which the current model is being compared. A significant test indicates that the model with fewer degrees of freedom is preferred over the model with more degrees of freedom. Selection among the models relies upon the likelihood-ratio test statistic. This test compares the differences in  $L^2$  scores for both models to the  $\chi^2$  distribution with degrees of freedom equal to the difference in df between the models.

Table B.7: Network Structure Models: Education High School

General Model #	Name	Diagonal	Distance	$L^2$	df	P-value	$\chi^2$	$\chi^2df$	$\chi^2Sig.$	Comp.model	
Stage 1	1	Constant	Unconstrained	-	1699.63	230	0.0000	NA	NA	NA	NA
	2	Differential	Unconstrained	-	1030.76	229	0.0000	668.87	1	0.0001	1
	3	Homogeneous	-	Unconstrained	4638.42	221	0.0000	NA	NA	NA	NA
Stage 2	4	Heterogeneous	-	Unconstrained	4624.88	220	0.0000	13.54	1	0.0002	3
	5	Het/Diff	Constrained	Constrained	321.35	209	0.0000	NA	NA	NA	NA
	6	Het/Diff	Unconstrained	Unconstrained	254.56	207	0.0135	66.49	2	0.0001	5
	7	Het/Diff	Xie	Xie	195.99	186	0.2934	58.57	21	0.0001	6
	8	Het/Diff	Constrained	Unconstrained	318.35	208	0.000	122.36	22	0.0001	7
	9	Het/Diff	Xie	Unconstrained	228.64	196	0.0550	32.65	10	0.0003	7
	10	Het/Diff	Unconstrained	Constrained	254.63	208	0.0121	58.64	22	0.0001	7
	11	Het/Diff	Unconstrained	Xie	211.25	197	0.2312	15.26	11	0.1709	7
	12	Het/Diff	Constrained	Xie	265.77	198	0.0009	54.52	1	0.0001	7
	13	Het/Diff	Xie	Constrained	238.36	197	0.0235	27.11	NA	NA	7

**Note:** " $\chi^2$ " refers to the  $\chi^2$  value of the likelihood test, " $\chi^2df$ " refers to the degrees of freedom for the test " $\chi^2Sig$ ", indicates the P-value of the test. Comp. Model is the number of the model to which the current model is being compared. A significant test indicates that the model with fewer degrees of freedom is preferred over the model with more degrees of freedom. Selection among the models relies upon the likelihood-ratio test statistic. This test compares the differences in  $L^2$  scores for both models to the  $\chi^2$  distribution with degrees of freedom equal to the difference in df between the models.

Table B.8: Network Structure Models: Education College

General Model #	Name	Diagonal	Distance	$L^2$	df	P-value	$\chi^2$	$\chi^2df$	$\chi^2Sig.$	Comp.model	
Stage 1	1	Constant	Unconstrained	-	648.80	230	0.0000	NA	NA	NA	NA
	2	Differential	Unconstrained	-	321.35	229	0.0000	327.45	1	0.0001	1
	3	Homogeneous	-	Unconstrained	2117.68	221	0.0000	NA	NA	NA	NA
	4	Heterogeneous	-	Unconstrained	2111.57	220	0.0000	6.11	1	0.0134	3
Stage 2	5	Het/Diff	Constrained	Constrained	219.14	209	0.3144	NA	NA	NA	NA
	6	Het/Diff	Unconstrained	Unconstrained	212.07	207	0.3896	7.07	2	0.0292	5
	7	Het/Diff	Xie	Xie	179.81	186	0.6140	170.4	21	0.0001	6
	8	Het/Diff	Constrained	Unconstrained	214.19	208	0.3694	34.38	22	0.0449	7
	9	Het/Diff	Xie	Unconstrained	189.62	196	0.6148	9.81	10	0.4573	7
	10	Het/Diff	Unconstrained	Constrained	212.07	207	0.3896	22.45	11	0.0211	7
	11	Het/Diff	Unconstrained	Xie	199.46	197	0.4375	9.84	1	0.0017	7
	12	Het/Diff	Constrained	Xie	201.25	198	0.4231	11.63	2	0.0030	7
	13	Het/Diff	Xie	Constrained	193.86	197	0.5498	4.24	1	0.0395	7

**Note:** " $\chi^2$ " refers to the  $\chi^2$  value of the likelihood test, " $\chi^2df$ " refers to the degrees of freedom for the test " $\chi^2Sig.$ ", indicates the P-value of the test. Comp. Model is the number of the model to which the current model is being compared. A significant test indicates that the model with fewer degrees of freedom is preferred over the model with more degrees of freedom. Selection among the models relies upon the likelihood-ratio test statistic. This test compares the differences in  $L^2$  scores for both models to the  $\chi^2$  distribution with degrees of freedom equal to the difference in df between the models.

Table B.9: Network Structure Models: Marital Status Single

General Model #	Name	Diagonal	Distance	$L^2$	df	P-value	$\chi^2$	$\chi^2df$	$\chi^2Sig.$	Comp.model	
Stage 1	1	Constant	Unconstrained	-	552.94	230	0.000	NA	NA	NA	NA
	2	Differential	Unconstrained	-	333.34	229	0.0000	21.96	1	0.0001	1
	3	Homogeneous	-	Unconstrained	1671.53	221	0.0000	NA	NA	NA	NA
	4	Heterogeneous	-	Unconstrained	1671.12	220	0.0000	0.41	1	0.5220	3
Stage 2	5	Het/Diff	Constrained	Constrained	202.20	209	0.6191	NA	NA	NA	NA
	6	Het/Diff	Unconstrained	Unconstrained	171.98	207	0.9637	30.22	2	0.0001	5
	7	Het/Diff	Xie	Xie	140.37	186	0.9947	31.61	21	0.0641	6
	8	Het/Diff	Constrained	Unconstrained	201.51	208	0.6136	61.14	22	0.0001	7
	9	Het/Diff	Xie	Unconstrained	148.83	196	0.9949	8.46	10	0.5840	7
	10	Het/Diff	Unconstrained	Constrained	172.0	208	0.9675	23.17	12	0.0263	9
	11	Het/Diff	Unconstrained	Xie	161.59	197	0.9692	12.76	1	0.0004	9
	12	Het/Diff	Constrained	Xie	189.29	198	0.6593	40.46	2	0.0001	9
	13	Het/Diff	Xie	Constrained	149.43	197	0.9952	0.6	1	0.4386	9

**Note:** " $\chi^2$ " refers to the  $\chi^2$  value of the likelihood test, " $\chi^2df$ " refers to the degrees of freedom for the test " $\chi^2Sig$ ", indicates the P-value of the test. Comp. Model is the number of the model to which the current model is being compared. A significant test indicates that the model with fewer degrees of freedom is preferred over the model with more degrees of freedom. Selection among the models relies upon the likelihood-ratio test statistic. This test compares the differences in  $L^2$  scores for both models to the  $\chi^2$  distribution with degrees of freedom equal to the difference in df between the models.

Table B.10: Network Structure Models: Marital Status Married

General Model #	Name	Diagonal	Distance	$L^2$	df	P-value	$\chi^2$	$\chi^2$ df	$\chi^2$ Sig.	Comp.model	
Stage 1	1	Constant	Unconstrained	-	1229.37	230	0	NA	NA	NA	NA
	2	Differential	Unconstrained	-	641.94	229	0.000	587.43	1	0.0001	1
	3	Homogeneous	-	Unconstrained	3582.07	221	0.000	NA	NA	NA	NA
	4	Heterogeneous	-	Unconstrained	3577.12	220	0.000	5.07	1	0.0243	3
Stage 2	5	Het/Diff	Constrained	Constrained	305.89	209	0.0000	NA	NA	NA	NA
	6	Het/Diff	Unconstrained	Unconstrained	259.73	207	0.0075	46.16	2	0.0001	5
	7	Het/Diff	Xie	Xie	207.53	186	0.1334	52.2	21	0.0002	6
	8	Het/Diff	Constrained	Unconstrained	303.61	208	0.0000	96.08	22	0.0001	7
	9	Het/Diff	Xie	Unconstrained	228.67	196	0.0548	74.94	12	0.0001	7
	10	Het/Diff	Unconstrained	Constrained	259.88	208	0.0084	31.21	12	0.0018	9
	11	Het/Diff	Unconstrained	Xie	234.47	197	0.0349	5.7	1	0.0170	9
	12	Het/Diff	Constrained	Xie	273.03	198	0.0003	44.36	2	0.0001	9
	13	Het/Diff	Xie	Constrained	233.60	197	0.0380	4.93	1	0.0264	9

**Note:** " $\chi^2$ " refers to the  $\chi^2$  value of the likelihood test, " $\chi^2$ df" refers to the degrees of freedom for the test " $\chi^2$ Sig", indicates the P-value of the test. Comp. Model is the number of the model to which the current model is being compared. A significant test indicates that the model with fewer degrees of freedom is preferred over the model with more degrees of freedom. Selection among the models relies upon the likelihood-ratio test statistic. This test compares the differences in  $L^2$  scores for both models to the  $\chi^2$  distribution with degrees of freedom equal to the difference in df between the models.

Table B.11: Rows and Column scores for Social Distance

Model	Gender	1	2	3	4	5	6	7	8	9	10	11	12
Non-Violent and High Self Reported Happiness													
Rows	Males	-0.1819	-0.1554	0.1688	-0.0194	-0.0423	-0.2968	-0.0257	0.1149	-0.1187	-0.0303	0.4627	0.1242
	Females	0.1819	0.1554	-0.1688	0.0194	0.0423	0.2968	0.0257	-0.1149	0.1187	0.0303	-0.4627	-0.1242
Columns	Males	-0.1819	-0.1554	0.1688	-0.0194	-0.0423	-0.2968	-0.0257	0.1149	-0.1187	-0.0303	0.4627	0.1242
	Females	0.1819	0.1554	-0.1688	0.0194	0.0423	0.2968	0.0257	-0.1149	0.1187	0.0303	-0.4627	-0.1242
Violent and High Self Reported Happiness													
Rows	Males	-0.1951	-0.0878	0.0276	-0.0453	-0.0158	-0.0308	-0.0226	-0.0024	-0.0337	0.0419	0.2441	0.0293
	Females	0.1951	0.0878	-0.0276	-0.0453	0.0158	0.0308	0.0226	0.0024	0.0337	-0.0419	-0.2441	-0.0293
Columns	Males	-0.1782	-0.1676	0.0698	0.0510	-0.0161	-0.1466	-0.0442	0.0080	-0.0224	0.0456	0.3609	0.0397
	Females	0.1782	0.1676	-0.0698	-0.0510	0.0161	0.1466	0.0442	-0.0080	0.0224	-0.0456	-0.3609	-0.0397
Non-Violent and Low Self Reported Happiness													
Rows	Males	0.4278	0.2112	0.2162	0.4889	0.0046	-0.1955	0.2633	-0.2557	-1.0954	-0.1760	0.3653	-0.2547
	Females	-0.4278	-0.2112	-0.2162	-0.4889	-0.0046	0.1955	-0.2633	0.2557	1.0954	0.1760	-0.3653	0.2547
Columns	Males	0.4424	0.2247	0.2286	0.5006	0.0750	-0.1832	0.2757	-0.2445	-1.0832	-0.1633	0.3775	-0.4505
	Females	-0.4424	-0.2247	-0.2286	-0.5006	-0.0750	0.1832	-0.2757	0.2445	1.0832	0.1633	-0.3775	0.4505
Violent and Low Self Reported Happiness													
Rows	Males	0.3511	0.5272	0.4037	0.2119	-0.2162	-0.7686	0.2114	-0.2065	-0.2402	0.1951	0.2158	-0.6846
	Females	-0.3511	-0.5272	-0.4037	-0.2119	0.2162	0.7686	-0.2114	0.2065	0.2402	-0.1951	-0.2158	0.6846
Columns	Males	0.3511	0.5272	0.4037	0.2119	-0.2162	-0.7686	0.2114	-0.2065	-0.2402	0.1951	0.2158	-0.6846
	Females	-0.3511	-0.5272	-0.4037	-0.2119	0.2162	0.7686	-0.2114	0.2065	0.2402	-0.1951	-0.2158	0.6846
Urban													
Rows	Males	-0.1474	-0.0563	0.0966	0.0507	-0.0727	-0.1605	-0.0151	-0.0246	-0.1016	0.0405	0.3131	0.0728
	Females	0.1474	0.0563	-0.0966	-0.0507	0.0727	0.1605	0.0151	0.0246	0.1016	-0.0405	-0.3131	-0.0728
Columns	Males	-0.1592	-0.0762	0.1084	0.0563	-0.0455	-0.2382	-0.0427	-0.0292	-0.0962	-0.0228	0.4261	0.0736
	Females	0.1592	0.0762	-0.1084	-0.0563	0.0455	0.2382	0.0427	0.0292	0.0962	-0.0228	-0.4261	-0.0736
Rural													

Continued on next page

Table B.11 – Continued from previous page

Model	Gender	1	2	3	4	5	6	7	8	9	10	11	12
Rows	Males	-0.4915	-0.5045	-0.0158	-0.1224	-0.4444	-0.2655	-0.0980	0.8677	0.1904	-0.0356	0.3285	0.1596
	Females	0.4915	0.5045	0.0158	-0.1224	0.4444	0.2655	0.0980	-0.8677	-0.1904	0.356	-0.3285	-0.1596
Columns	Males	-0.4915	-0.5045	-0.0158	-0.1224	-0.4444	-0.2655	-0.0980	0.8677	0.1904	-0.0356	0.3285	0.1596
	Females	0.4915	0.5045	0.0158	-0.1224	0.4444	0.2655	0.0980	-0.8677	-0.1904	0.356	-0.3285	-0.1596
Single													
Rows	Males	-0.3002	-0.2259	0.1479	-0.3406	-0.0421	-0.0999	-0.0514	-0.0216	-0.0757	-0.1386	0.4916	0.3792
	Females	0.3002	0.2259	-0.1479	0.3406	0.0421	0.0999	0.0514	0.0216	0.0757	-0.1386	-0.4916	-0.3792
Columns	Males	-0.3002	-0.2259	0.1479	-0.3406	-0.0421	-0.0999	-0.0514	-0.0216	-0.0757	-0.1386	0.4916	0.3792
	Females	0.3002	0.2259	-0.1479	0.3406	0.0421	0.0999	0.0514	0.0216	0.0757	-0.1386	-0.4916	-0.3792
Married													
Rows	Males	-0.2363	-0.2171	0.0928	0.0674	-0.1434	-0.0044	0.0305	0.0923	-0.2314	0.0599	0.3704	0.1192
	Females	0.2363	0.2171	0.0928	0.0764	0.1434	0.0044	0.0305	-0.0923	0.2314	-0.0599	-0.3704	-0.1192
Columns	Males	-0.2363	-0.2171	0.0928	0.0674	-0.1434	-0.0044	0.0305	0.0923	-0.2314	0.0599	0.3704	0.1192
	Females	0.2363	0.2171	0.0928	0.0764	0.1434	0.0044	0.0305	-0.0923	0.2314	-0.0599	-0.3704	-0.1192
High School													
Rows	Males	-0.2281	-0.0960	0.0262	0.0451	-0.0868	-0.1002	-0.0496	-0.0876	0.0052	0.0653	0.3454	0.1612
	Females	0.2281	0.0960	-0.0262	-0.0451	0.0868	0.1002	0.0496	0.0876	-0.0052	-0.0653	-0.3454	-0.1612
Columns	Males	-0.2313	-0.1331	0.0466	0.1125	-0.1164	-0.1834	-0.0697	-0.0867	0.0012	0.0169	0.5086	0.1373
	Females	0.2313	0.1331	-0.0466	-0.1125	0.1164	0.1834	0.0697	0.0867	-0.0012	-0.0169	-0.5086	-0.1373
College													
Rows	Males	-0.0869	-0.1689	0.2642	-0.0706	-0.0078	-0.2314	0.0707	0.2282	-0.2483	0.0162	0.3104	-0.0759
	Females	0.0869	0.1689	-0.2642	0.0706	0.0078	0.2314	-0.0707	-0.2282	0.2483	-0.0162	-0.3104	0.0759
Columns	Males	-0.0869	-0.1689	0.2642	-0.0706	-0.0078	-0.2314	0.0707	0.2282	-0.2483	0.0162	0.3104	-0.0759
	Females	0.0869	0.1689	-0.2642	0.0706	0.0078	0.2314	-0.0707	-0.2282	0.2483	-0.0162	-0.3104	0.0759

**Note:** Scores in a Goodman RC model are normalized such that the weighted sum of scores equals zero and the weighted sum of squares of scores equals 1 (see Agresti, 2002, p. 380). There are 12 categories: 1. Church or religion, 2. Group or association that promote some religious values different than church, 3. Political party or movement or political organization, 4. Professional, trade union or trade union organization, 5. Students or alumni association, 6. The board of parent association, 7. Neighboring organization, 8. NGO, 9. Volunteer or philanthropic association, 10. Self-Help Group, 11. League or association sports, 12. Another civil association of voluntary affiliation (i.e. scouts, rotarians).

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APPENDIX C  
CHAPTER 3 OF APPENDIX

Table C.1: Respondent Demographic Characteristic

		Completed (N=111)	Residents Non-Violent Locations (N=26)	Residents Violent Locations (N=85)
Gender	Male	48.65	65.38	43.53
	Female	51.35	34.62	56.47
Marital Status	Single	62.16	65.38	61.18
	Married	27.03	19.23	29.41
	Non Married Couple	5.41	7.69	4.71
	Separate	0.90	0.0	1.18
	Divorce	3.60	3.85	3.53
	Widowed	0.90	3.85	0.0
Education Level	None	0.0	0.0	0.0
	Incomplete Elementary School	0.0	0.0	0.0
	Complete Elementary School	0.90	0.0	1.18
	Incomplete Middle School	0.90	0.0	1.18
	Complete Middle School	0.90	3.85	1.18
	Incomplete High School	6.31	7.69	5.88
	Complete High School	14.41	23.08	11.76
	Some College	18.56	15.38	20
	Bachelor's Degree	36.04	26.92	38.92
	Graduate Degree	20.72	23.08	20.0
Age	Less 18	1.80	0.0	2.35
	18-19	5.41	7.69	4.71
	20-24	24.32	26.92	23.53
	25-29	17.12	11.54	18.82
	30-34	12.61	3.85	15.29
	35-39	8.11	11.54	7.06
	40-44	10.81	15.38	9.41
	45-49	5.41	3.85	5.88
	50-54	5.41	11.54	3.53
	55-59	5.41	3.85	5.88
	60+	3.60	3.85	3.53
Household Size	1	4.50	11.53	2.35
	2	25.23	23.08	25.88
	3	20.72	30.77	17.65
	4 and above	49.55	34.62	54.12
Employment Status	Employed	67.57	57.69	70.59
	Unemployed	9.91	11.54	9.41

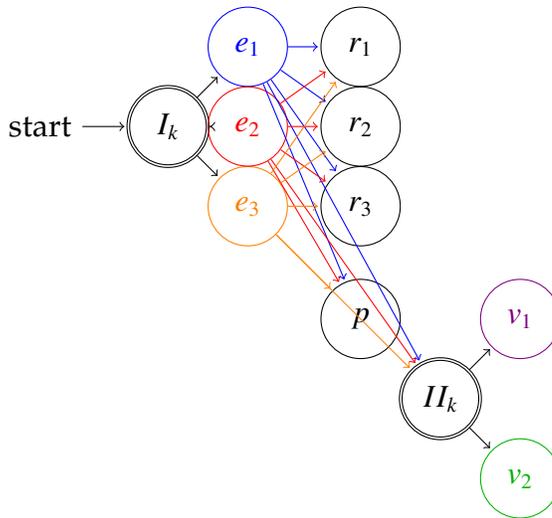
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Table C.1 – Continued from previous page

	Completed	Non-Violent	Violent
Not in labor Force	22.52	30.77	20.0

*Note: All number are percentages, the table report all respondents who complete the experiment.*

Figure C.1: Experimental Flow Chart



- $I_k$ = Experiment 1 starts
- $e_1$ = emotion condition 1- sad
- $e_2$ = emotion condition 2- afraid
- $e_3$ = emotion condition 3- angry
- $r_1$ = risk perception future events
- $r_2$ = self risk perception future events
- $r_3$ = risk perception future events for an average person
- $p$ = policy preferences
- $II_k$ = Experiment 2 starts
- $v_1$ = determined condition
- $v_2$ = undetermined condition

Table C.2: Self-Reported Emotion by Treatment Emotion Condition

<b>How you feel today</b>	<b>Emotion Condition</b>			<b>Total</b>
	<b>SAD</b>	<b>AFRAID</b>	<b>ANGER</b>	
1 Open	2	2	4	8
2 Happy	5	6	7	18
3 Alive	2	3	2	7
4 Good	10	11	11	32
5 Love	1	0	1	2
6 Interested	1	4	1	6
7 Positive	2	4	5	11
8 Strong	3	0	1	4
9 Angry	1	1	0	2
10 Depressed	0	0	1	1
11 Confused	4	1	2	7
12 Helpless	2	3	3	8
13 Indifferent	0	1	0	1
14 Afraid	0	1	0	1
16 Sad	2	0	1	3
<b>Total</b>	<b>35</b>	<b>37</b>	<b>39</b>	<b>111</b>

*Note: all numbers are frequencies.*

Table C.3: Feel about Drug War by Treatment Emotion Condition

<b>How R felt about Drug War</b>	<b>Emotion Condition</b>			<b>Total</b>
	<b>SAD</b>	<b>AFRAID</b>	<b>ANGER</b>	
Sad	26	3	6	35
Afraid	2	33	2	37
Anger	4	5	30	39
<b>Total</b>	<b>32</b>	<b>41</b>	<b>38</b>	<b>111</b>

*Note: all numbers are frequencies.*

Table C.4: Pairwise comparisons of Adjusted Predictions: Risk of Future Events

	Delta-Method					
	(1)	(2)	(3)	(4)	(5)	(6)
Risk/Sad						
Afraid vs Sad	-0.273 (0.173)	-0.281 (0.190)	0.296 (0.202)	0.0819 (0.202)	-0.153 (0.200)	-0.0409 (0.214)
Anger vs Sad	-0.339** (0.171)	-0.303 (0.187)	0.0227 (0.199)	-0.101 (0.199)	-0.188 (0.198)	-0.385* (0.212)
Anger vs Afraid	-0.065 (0.168)	-0.021 (0.184)	-0.273 (0.196)	-0.182 (0.196)	-0.034 (0.195)	-0.344 (0.208)

Model VCE: OLS, Standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table C.5: Nonparametric: Perception of Risk of Future events of Drug Violence & Corruption in Mexico

$Ec_j=AFRAID$	Statistic	df	F(df1, df2)		F	Sig ( $p$ )
Wilks'lambda	0.0121	4	24	98.9	10.50	0.0001
Em Condition	0.0822	1	6.0	28.0	52.10	0.0001
SelfReporWar	0.9222	1	6.0	28.0	0.39	0.8769
EmCondition&SelfReportWar	0.8063	2	12.0	56.0	0.53	0.8858
$Ec_j=ANGRY$	Statistic	df	F(df1, df2)		F	Sig ( $p$ )
Wilks'lambda	0.0217	4	24.0	105.9	8.82	0.0001
Em Condition	0.2216	1	6.0	30.0	17.56	0.0001
SelfReporWar	0.8334	1	6	30.0	1.0	0.4440
EmCondition&SelfReportWar	0.6522	2	12.0	60.0	1.19	0.3103

**Note:** This table reports multivariate statistics and the results show Wilks' lambda estimations to test our hypotheses. The column labeled df gives the hypothesis degrees of freedom, the residual degrees of freedom, and the total degrees of freedom. The next three columns are labeled  $F(df1, df2) = F$ , and for each of the four multivariate tests, the degrees of freedom and F-statistic are listed. The following column gives the associated p-values for the F-statistics.

Table C.6: Pairwise comparisons of Adjusted Predictions:  
Risk of Future Events for Self

Risk	Delta-Method									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Afraid vs Sad	-0.134 (0.193)	0.0618 (0.183)	-0.00927 (0.165)	-0.139 (0.197)	0.0672 (0.204)	0.0579 (0.163)	-0.219 (0.171)	-0.0193 (0.186)	0.0888 (0.183)	0.188 (0.169)
Anger vs Sad	-0.127 (0.190)	-0.0623 (0.181)	-0.0945 (0.163)	-0.0842 (0.195)	-0.0520 (0.202)	-0.147 (0.161)	-0.0571 (0.169)	0.0916 (0.184)	0.0659 (0.181)	0.0996 (0.167)
Anger vs Afraid	0.007 (0.187)	-0.124 (0.178)	-0.085 (-0.852)	0.547 (0.191)	-0.119 (0.198)	-0.204 (0.158)	0.162 (0.166)	0.110 (0.181)	-0.022 (0.177)	-0.880 (0.164)

Model VCE: OLS, Standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table C.7: Nonparametric: Risk of Future events of Drug Violence for Self in 12 months

$Ec_j$ =SAD	Statistic	df	F(df1, df2)		F	Sig ( $p$ )
Wilks' lambda	0.0058	4	40	85.3	6.15	0.0001
Em Condition	0.2036	1	10	22	8.60	0.0001
SelfReporWar	0.6985	1	10.0	22	0.95	0.5105
EmCondition&SelfReportWar	0.4330	2	20.0	44.0	1.14	0.3450
$Ec_j$ =AFRAID	Statistic	df	F(df1, df2)		F	Sig ( $p$ )
Wilks' lambda	0.0065	4	40.0	92.9	6.45	0.0001
Em Condition	0.0784	1	10	24.0	28.23	0.0001
SelfReporWar	0.7766	1	10	24.0	0.69	0.7233
EmCondition&SelfReportWar	0.5251	2	20.0	48.0	0.91	0.5750
$Ec_j$ =ANGRY	Statistic	df	F(df1, df2)		F	Sig ( $p$ )
Wilks' lambda	0.0142	4	40.0	100.4	5.20	0.0001
Em Condition	0.1880	1	10.0	26.0	11.23	0.0001
SelfReporWar	0.8518	1	10	26.0	0.45	0.9053
EmCondition&SelfReportWar	0.6675	2	20.0	52.0	0.58	0.9075

**Note:** This table reports multivariate statistics and the results show Wilks' lambda estimations to test our hypotheses. The column labeled df gives the hypothesis degrees of freedom, the residual degrees of freedom, and the total degrees of freedom. The next three columns are labeled  $F(df1, df2) = F$ , and for each of the four multivariate tests, the degrees of freedom and F-statistic are listed. The following column gives the associated p-values for the F-statistics.

Table C.8: Pairwise comparisons of Adjusted Predictions:  
Risk of Future Events for an Average Mexican

Risk	Delta-Method									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Afraid vs Sad	-0.0996 (0.163)	-0.161 (0.173)	-0.0834 (0.156)	-0.0741 (0.178)	-0.0154 (0.181)	-0.110 (0.178)	0.123 (0.174)	0.177 (0.185)	0.0656 (0.175)	0.171 (0.167)
Anger vs Sad	0.0161 (0.161)	-0.127 (0.170)	0.0469 (0.154)	0.0645 (0.176)	-0.0293 (0.179)	-0.0557 (0.176)	-0.0234 (0.172)	-0.0491 (0.183)	-0.106 (0.173)	0.0161 (0.165)
Anger vs Afraid	0.115 (0.158)	0.034 (0.167)	0.130 (0.151)	0.138 (0.173)	-0.138 (0.176)	0.054 (0.173)	-0.146 (0.169)	-0.225 (0.180)	-0.171 (0.170)	-0.154 (0.162)

Model VCE: OLS, Standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table C.9: Nonparametric: Risk of Future events of Drug Violence for an Average Mexican in 12 months

$Ec_j$ =SAD	Statistic	df	F(df1, df2)		F	Sig ( <i>p</i> )
Wilks' lambda	0.0040	4	40.0	85.3	7.00	0.0001
Em Condition	0.1167	1	10.0	22.0	16.65	0.0001
SelfReporWar	0.7169	1	10	22.0	16.65	0.0001
EmCondition&SelfReportWar	0.4683	2	20.0	44.0	1.01	0.4667
$Ec_j$ =AFRAID	Statistic	df	F(df1, df2)		F	Sig ( <i>p</i> )
Wilks' lambda	0.0109	4	40	92.9	5.32	0.0001
Em Condition	0.1701	1	10	24	11.71	0.0001
SelfReporWar	0.5173	1	10	24.0	2.24	0.0514
EmCondition&SelfReportWar	0.6368	2	20.0	48.0	0.61	0.8874
$Ec_j$ =ANGRY	Statistic	df	F(df1, df2)		F	Sig ( <i>p</i> )
Wilks' lambda	0.0133	4	40.0	100.4	5.33	0.0001
Em Condition	0.1814	1	10.0	26.0	11.73	0.0001
SelfReporWar	0.7639	1	10.0	26.0	0.80	0.6270
EmCondition&SelfReportWar	0.6711	2	20.0	52.0	0.57	0.9133

**Note:** This table reports multivariate statistics and the results show Wilks' lambda estimations to test our hypotheses. The column labeled df gives the hypothesis degrees of freedom, the residual degrees of freedom, and the total degrees of freedom. The next three columns are labeled  $F(df1, df2) = F$ , and for each of the four multivariate tests, the degrees of freedom and F-statistic are listed. The following column gives the associated p-values for the F-statistics.

Table C.10: Pairwise comparisons of Adjusted Predictions: Policy Preferences

Policy Preference	Delta-Method			
	(1)	(2)	(3)	(4)
Afraid vs Sad	0.344 (0.316)	-0.0363 (0.349)	-0.280 (0.338)	0.213 (0.318)
Anger vs Sad	-0.0659 (0.312)	-0.274 (0.345)	-0.301 (0.334)	-0.237 (0.314)
Anger vs Afraid	-0.409 (0.307)	-0.237 (0.339)	-0.207 (0.328)	-0.449 (0.309)

Model VCE: OLS, Standard errors in parentheses

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

Table C.11: Nonparametric: Policy Preferences by Emotion Condition

$Ec_j=\text{SAD}$	Statistic	df	F(df1, df2)		F	Sig ( $p$ )
Wilks' lambda	0.0452	4	16.0	86.2	9.46	0.0001
Em Condition	0.3864	1	4	28.0	11.11	0.0001
SelfReporWar	0.9856	1	4	28.0	0.10	0.9808
EmCondition&SelfReportWar	0.7159	2	8.0	56.0	1.27	0.2760
$Ec_j=\text{AFRAID}$	Statistic	df	F(df1, df2)		F	Sig ( $p$ )
Wilks' lambda	0.0335	4	16.0	92.3	11.77	0.0001
Em Condition	0.2449	1	4	30.0	23.13	0.0001
SelfReporWar	0.9469	1	4	30.0	0.42	0.7925
EmCondition&SelfReportWar	0.7036	2	8.0	60.0	1.44	0.1983
$Ec_j=\text{ANGRY}$	Statistic	df	F(df1, df2)		F	Sig ( $p$ )
Wilks' lambda	0.0724	4	16	98.4	8.37	0.0001
Em Condition	0.3970	1	4	32.0	12.15	0.0001
SelfReporWar	0.8798	1	4	32.0	1.09	0.3768
EmCondition&SelfReportWar	0.8331	2	8.0	64.0	0.76	0.6348

**Note:** This table reports multivariate statistics and the results show Wilks' lambda estimations to test our hypotheses. The column labeled df gives the hypothesis degrees of freedom, the residual degrees of freedom, and the total degrees of freedom. The next three columns are labeled  $F(\text{df1}, \text{df2}) = F$ , and for each of the four multivariate tests, the degrees of freedom and F-statistic are listed. The following column gives the associated p-values for the F-statistics.

Table C.12: Allocations by Treatment Identification and Emotion Condition

Allocation	Emotion Condition						TOTAL	
	ANGRY		SAD		AFRAID			
	Det	Undet	Det	Undet	Det	Undet	Det	Undet
\$10 USD	14	6	7	10	13	7	34	23
\$5 USD	4	3	2	4	2	0	8	7
\$0 USD	7	5	1	11	7	8	15	24

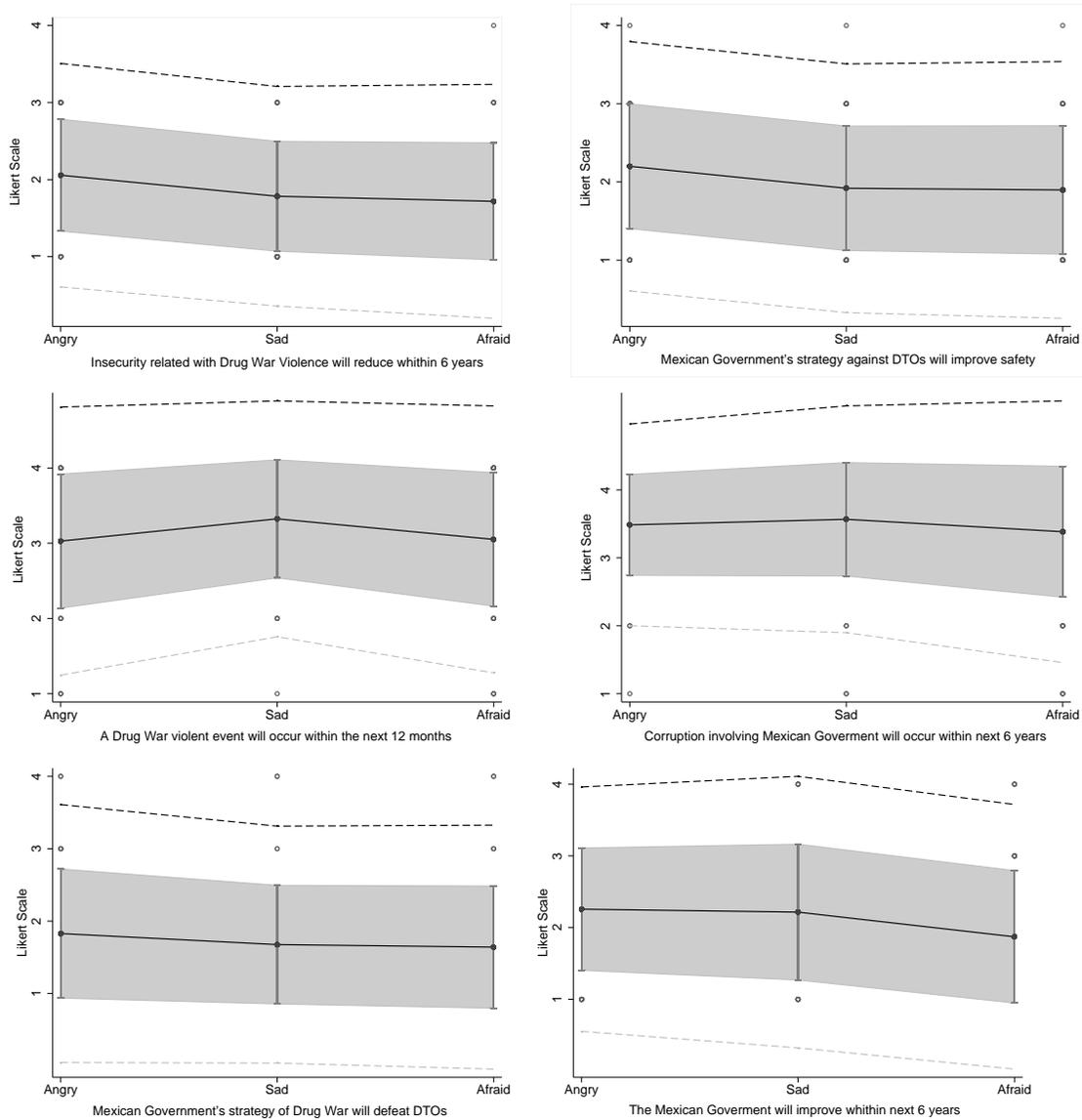
**Note:** This table reports the allocations by emotion condition and treatment identification. Det refers to the determined victim identification "has been selected" and und refers to the undetermined victim treatment "will be chosen".

Table C.13: Nonparametric: Allocation by Identification & Emotion Condition

	Statistic	df	F(df1, df2)	F	Sig (p)
Wilks' lambda	0.8383	18	18.0 92.0	0.99	0.4827
$Ec_j$	0.9639	2	2.0 92.0	1.72	0.1844
$Ident_k$	0.9736	1	1.0 92.0	2.50	0.1173
$Ewar_l$	0.9628	3	3.0 92.0	1.19	0.3193
$Ec_j \& Ident_k$	0.9751	2	2.0 92.0	1.17	0.3138
$Ec_j \& Ewar_l$	0.9673	1	1.0 92.0	3.11	0.0811
$Ewar_l \& Ident_k$	0.9961	3	3.0 92.0	0.12	0.9473
$Ec_j \& Ident_k \& Ewar_l$	0.9206	6	6.0 92.0	1.32	0.2549

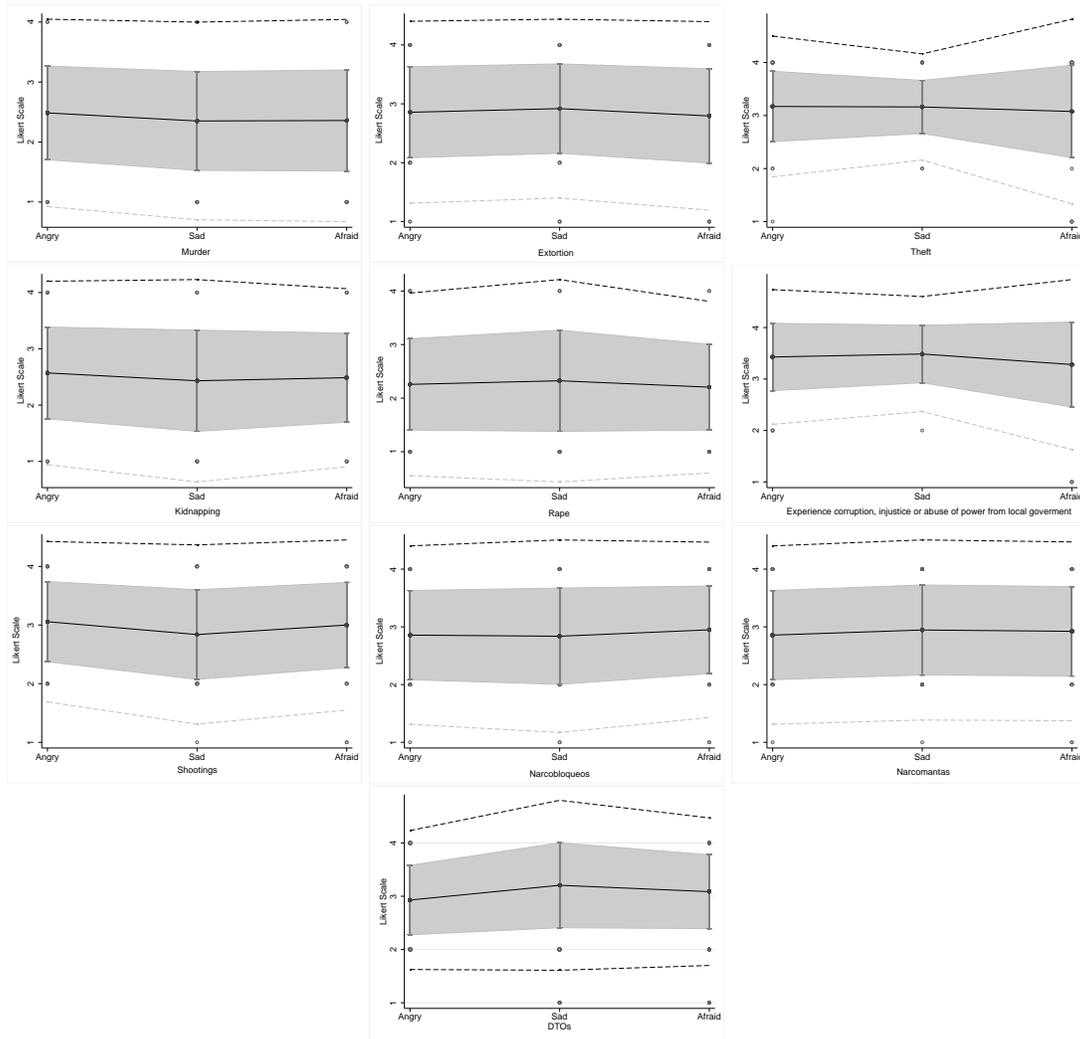
**Note:** This table report multivariate statistics and the results show Wilks' lambda estimations to test our hypotheses. The column labeled df gives the hypothesis degrees of freedom, the residual degrees of freedom, and the total degrees of freedom. The next three columns are labeled  $F(df1, df2) = F$ , and for each of the four multivariate tests, the degrees of freedom and F-statistic are listed. The following column gives the associated p-values for the F-statistics.

Figure C.2: Means of Risk Perception for Future events by Emotion Condition



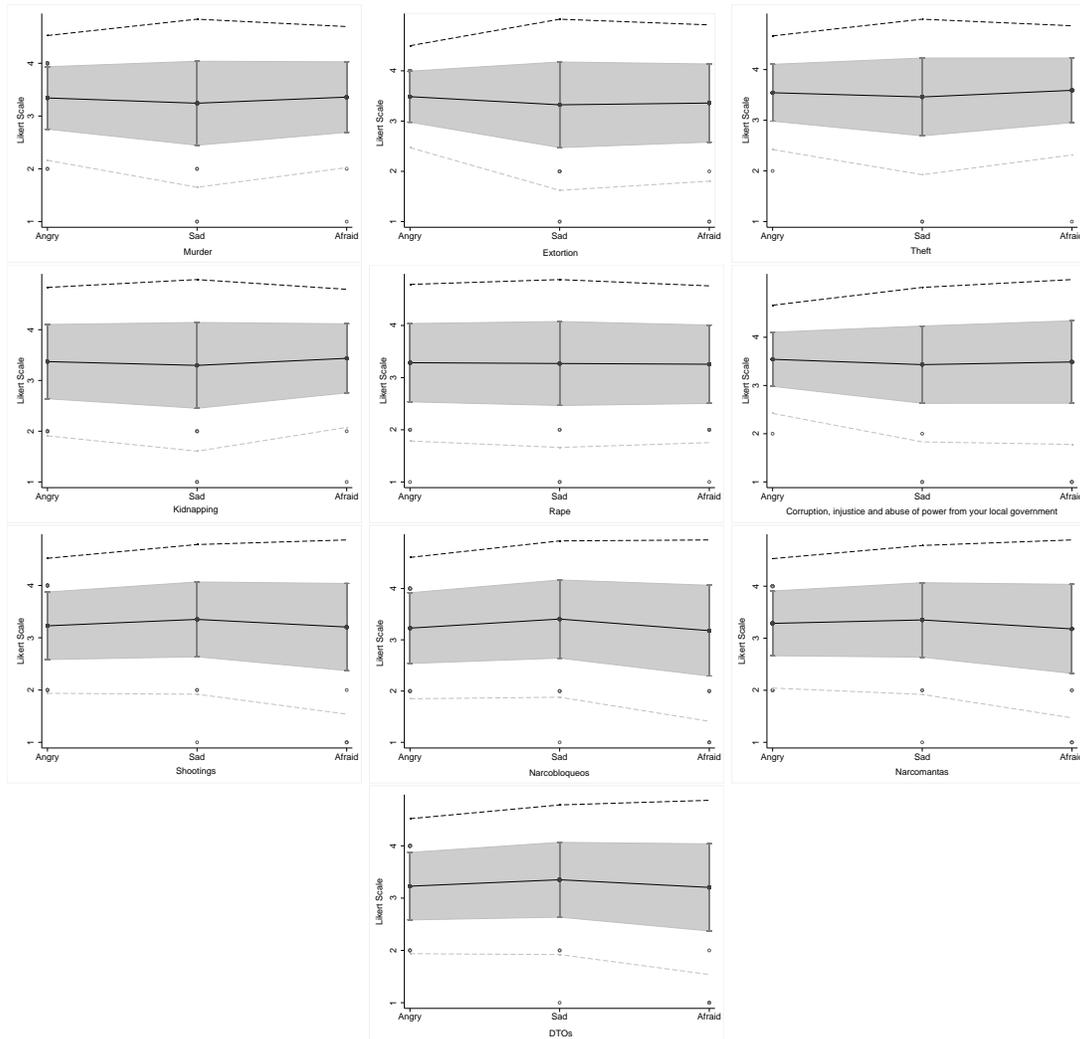
Note: These means plot show a four-item Likert-type scale with six judgments of risk based on the possibility that might happen the next 6 years. Respondents evaluated them by choosing one option between 1-Extreme Unlikely, 2-Unlikely, 3-Likely, 4-Extreme Likely.

Figure C.3: Means of Risk Perception for Future events for Self within the next 12 months by Emotion Condition



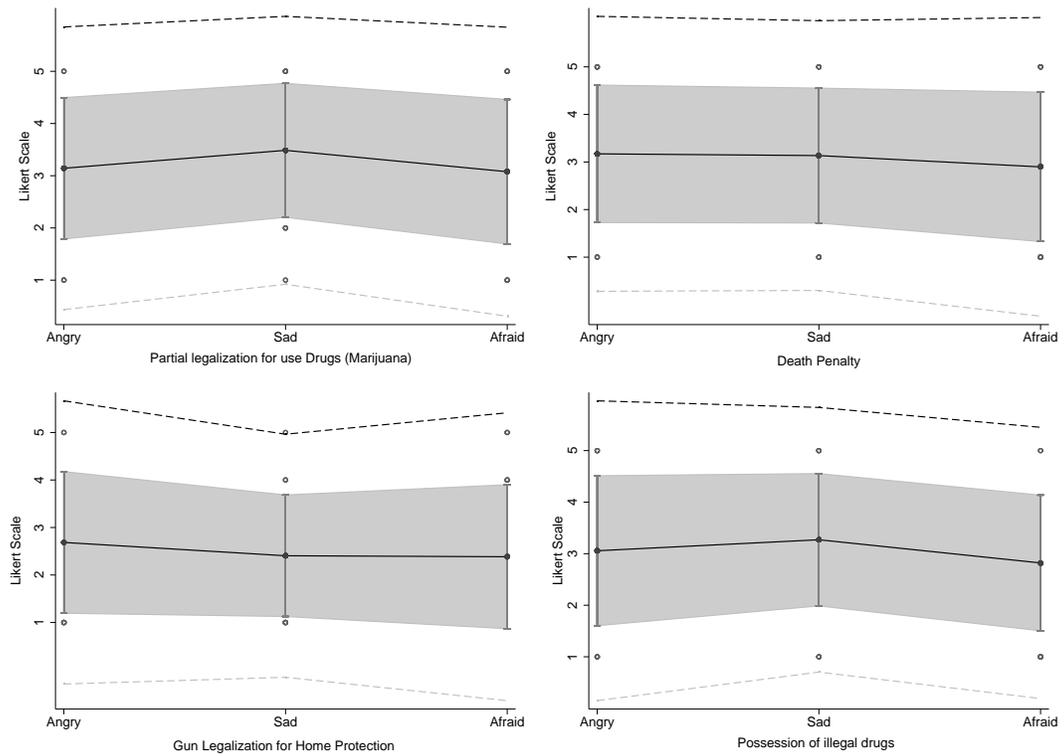
Note: These mean plot show a four-item Likert-type scale with 10 judgments of risk based on the possibility that the respondent might experience the events within the next 12 months. Respondents evaluated them by choosing one option between 1-Extreme Unlikely, 2-Unlikely, 3-Likely, 4-Extreme Likely.

Figure C.4: Means of Risk Perception for future events for an Average citizen within the next 12 months by Emotion Condition



Note: These means plot show a four-item Likert-type scale with 10 judgments of risk based on the possibility that an average Mexican might experience the events within the next 12 months. Respondents evaluated them by choosing one option between 1-Extreme Unlikely, 2-Unlikely, 3-Likely, 4-Extreme Likely.

Figure C.5: Means of Policy Preferences by Emotion Condition



Note: These means plot show a five level of support or opposition scale with 5 judgments over public policies. Respondents evaluated them by choosing one option between 1-Strongly oppose, 2-Somewhat oppose, 3-Neutral, 4-Somewhat Favor, 5-Strongly Favor.

Figure C.6: Experiment Screens

Estimado Participante:

Mi nombre es Fernando Plascencia y soy estudiante de doctorado en la Universidad de Cornell. Para mi tesis, estoy estudiando el bienestar (felicidad y satisfacción), así como las redes sociales de soporte de los Mexicanos. El propósito de mi investigación es analizar los posibles efectos de la Guerra contra el narcotráfico en México en el bienestar de la población mexicana. Considerando que usted vive en México y conoce la importancia de este problema, lo invito cordialmente a participar en esta investigación contestando esta encuesta.

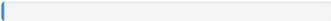
La presente encuesta requiere aproximadamente **20 minutos** para ser contestada. Si usted decide participar y responder completa esta encuesta usted recibirá 10 dólares en tarjetas de regalo de Amazon. No existe ningún riesgo en su participación. Para asegurar que toda la información que proporcione sea confidencial no se le preguntará ni su nombre ni tampoco su dirección. Tampoco hay posibilidad de identificación individual. Usted solo accederá por medio de Facebook. Si usted desea participar en este proyecto, por favor responda todas las preguntas tan honesta como le sea posible. **Su participación es estrictamente voluntaria y usted puede reusarse a participar en cualquier momento.** Gracias por tomarse el tiempo de asistirme en lograr este proyecto. La información que se obtendrá será de utilidad para estudiar el bienestar de los mexicanos. Esta investigación ha sido aprobada por la Junta de Revisión Ética por la Universidad de Cornell (██████████). Si usted requiere información adicional o tiene preguntas, por favor diríjelas al correo que se indica abajo. Atentamente,

Fernando Plascencia  
jp975@cornell.edu

Presione el logo de Facebook si acepta participar en esta encuesta: 

In this section we will like to know general information about you, please answer the following questions:  
What is your sex?

Male  
 Female



What is your marital status?

Single  
 Married  
 Non Married Couple  
 Separate  
 Divorced  
 Widowed

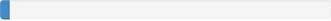


Figure C.7: Experiment Screens

What is the highest education level you completed?

- None
- Incomplete Elementary School
- Complete Elementary School
- Incomplete Middle School
- Complete Middle School
- Incomplete High School
- Complete High School
- Some college
- Bachelor's Degree
- Graduate Degree

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What is your age?

- less than 18
- 18 - 19
- 20 - 24
- 25 - 29
- 30 - 34
- 35 - 39
- 40 - 44
- 45 - 49
- 50 - 54
- 55 - 59
- 60 or over

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What is your current employment status?

- Employed
- Unemployed
- Not in labor force

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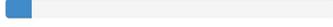


Figure C.8: Experiment Screens

How many people live in your household (including yourself)?

- 1
- 2
- 3
- 4 or more

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What is your income?

- Up to 1 minimum wage.
- More than 1 less than 2 minimum wages
- More than 2 less than 3 minimum wages
- More than 3 less than 5 minimum wages
- More than 5 minimum wages

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What state do you live in?

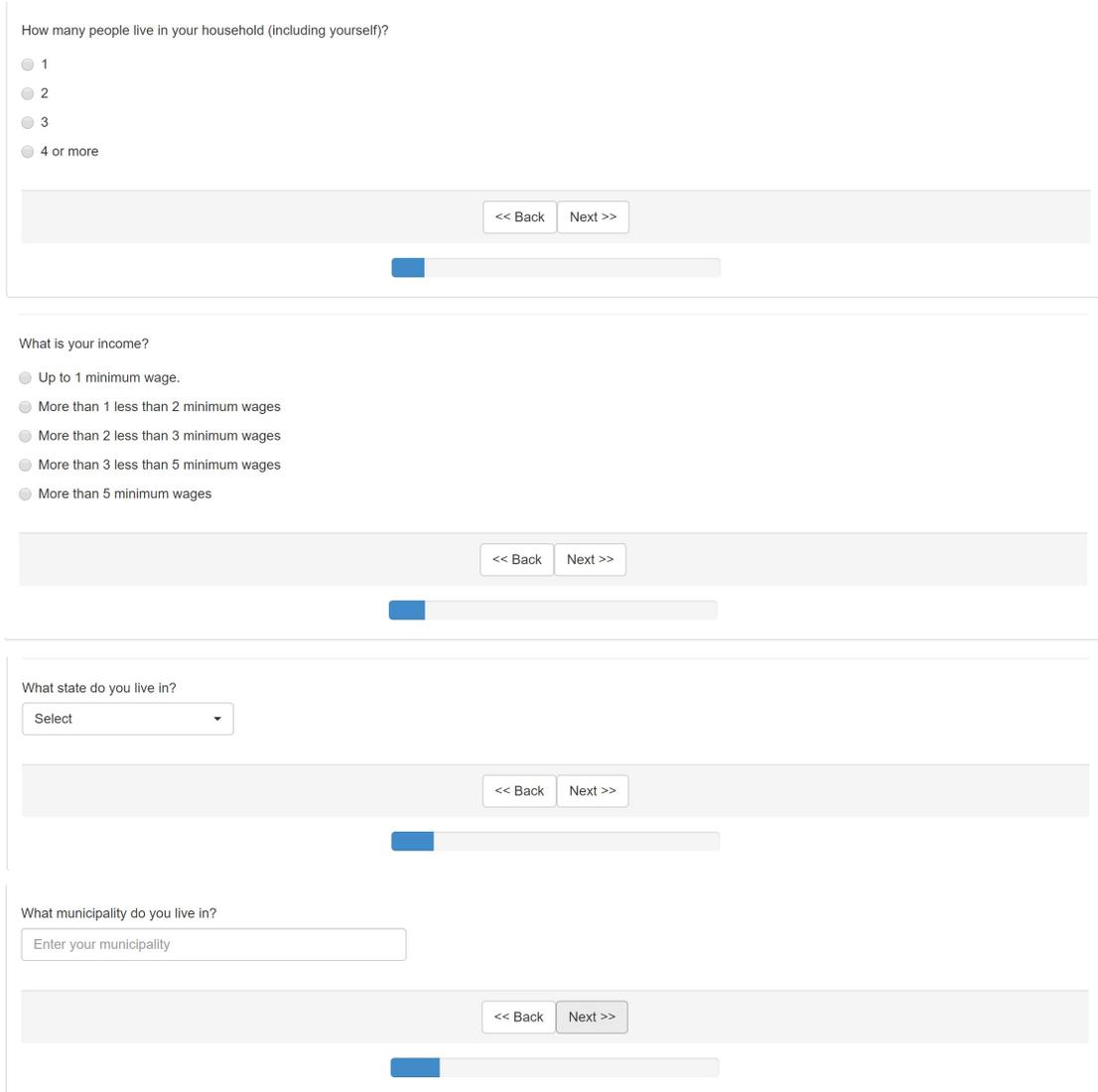
Select ▾

<< Back   Next >>

What municipality do you live in?

Enter your municipality

<< Back   Next >>



## Figure C.9: Experiment Screens

This section of the survey measures pro-social behavior. This section is divided into two sections: your perspective or risk and policy choices, and your actual engagement, attitudes toward community.

Well-being involves the aspects of happiness and life satisfaction, we are particularly interested how do you mainly feel today:

- Open
- Happy
- Alive
- Good
- Love
- Interested
- Positive
- Strong
- Angry
- Depressed
- Confused
- Helpless
- Indifferent
- Afraid
- Hurt
- Sad

Next >>

Please select the one feeling from the list below.

- Great
- Gay
- Joyous
- Lucky
- Fortunate
- Delighted
- Overjoyed
- Gleeeful
- Thankful
- Important
- Festive
- Ecstatic
- Satisfied
- Glad
- Cheerful
- Sunny
- Merry
- Elated
- Jubilant

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## Figure C.10: Experiment Screens

Drug War and corruption in Mexico evoke a lot of emotions in Mexicans. We are particular interested in what makes you most **afraid** about the drug war. Please describe in detail one thing that makes you more **afraid** about the Drug war and corruption in Mexico. If you can, write your description so that someone reading it might even get **afraid** from learning about the situation. What aspect of the drug war violence makes you the most **afraid**? Why does it make you so **afraid**?

<< Back Next >>

Please take a look at the following pictures:



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Figure C.11: Experiment Screens

Thinking about the following events we want to know your opinion about the likelihood that the next points will occur in Mexico:

	Extremely unlikely	Unlikely	Likely	Extremely likely
Insecurity related with the Drug war will reduce in the next 6 years (low rate of murders, extortion, smuggling, thefts, kidnappings, beheadings)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Safety in you city will improve dramatically as a result of the drug war strategy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Another major violence event related with drug war will occur within the next 12 months	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Another major act of corruption in the government will occur within the next 6 years	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mexican Government's strategy of drug war will be able to end with Drug traffic organizations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mexican Government will improve in the next 6 years.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



---

Thinking about these events we want to know your opinion if you feel that **you** would experience some of following events within the next 12 months.

Insecurity

	Extremely unlikely	Unlikely	Likely	Extremely likely
Murder	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Extortion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Theft	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Kidnapping	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Rape	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



---

Thinking about these events we want to know your opinion if you feel that **you** would experience some of following events within the next 12 months.

	Extremely unlikely	Unlikely	Likely	Extremely likely
Experience corruption, injustice and abuse of power from your local government	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



Figure C.12: Experiment Screens

Thinking about these events we want to know your opinion if you feel that **you** would experience some of following events within the next 12 months.

Experience explicit drug violence

	Extremely unlikely	Unlikely	Likely	Extremely likely
Shooting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Narcobloqueos	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Narcomantas	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Drug trafficking or see the presence of Drug Traffic Organizations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



Thinking about these events we want to know your opinion if you feel that **other people (average Mexican people)** would experience some of following events within the next 12 months.

Insecurity

	Extremely unlikely	Unlikely	Likely	Extremely likely
Murder	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Extortion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Theft	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Kidnapping	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Rape	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



Thinking about these events we want to know your opinion if you feel that **other people (average Mexican people)** would experience some of following events within the next 12 months.

	Extremely unlikely	Unlikely	Likely	Extremely likely
Experience corruption, injustice and abuse of power from your local government	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



Figure C.13: Experiment Screens

Thinking about these events we want to know your opinion if you feel that **other people (average Mexican people)** would experience some of following events within the next 12 months.

Experience explicit drug violence

	Extremely unlikely	Unlikely	Likely	Extremely likely
Shooting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Narcoobloqueos	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Narcomantas	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Drug trafficking or see the presence of Drug Traffic Organizations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



Thinking about policy preferences we want to know if you oppose or support the following possible government policies.

	Strongly opposed	Somewhat oppose	Neutral	Somewhat support	Strongly support
Do you favor or oppose a law that would consider the partial legalization of drug use?	<input type="radio"/>				
Do you favor or oppose the death penalty for person convicted of murder?	<input type="radio"/>				
Do you favor or oppose a law which would require a person to obtain a police permit before he or she would buy a gun?	<input type="radio"/>				
Would you favor or oppose a law which considers obligate people to pay a fine that carry or use some specific quantities of drugs instead go to prison?	<input type="radio"/>				



Figure C.14: Experiment Screens

Please take a look at the following pictures:



The figure displays eight photographs arranged in a 4x2 grid, illustrating scenes of conflict and protest. The top-left image shows a group of people sitting on a wall with a banner that reads '23 AÑOS LARGAS' and '25 AÑOS LARGAS'. The top-right image shows a large crowd of people marching with a banner that reads '¡FRENTE ÚNICO LA VIDA EN LOS CAMPOS!'. The middle-left image shows a night scene with a crowd and a banner that reads '¡VIVIR EN LA VIDA'. The middle-right image shows a soldier in a military uniform aiming a rifle at a crowd of people, including a child in a red shirt. The bottom-left image shows a car on fire on a road. The bottom-right image shows a group of people sitting on a wall, similar to the top-left image. The bottom-most image shows a large crowd of people holding up portraits of individuals. The bottom-most image shows soldiers in military uniforms standing in a line, with one soldier in the foreground holding a rifle.

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Progress bar: [Blue segment] [Grey segment]

Figure C.15: Experiment Screens

Drug war in Mexico evokes a lot of emotions we are particularly interested in how do you feel about this issue.

- Open
- Happy
- Alive
- Good
- Love
- Interested
- Positive
- Strong
- Angry
- Depressed
- Confused
- Helpless
- Indifferent
- Afraid
- Hurt
- Sad



Please select the one feeling from the list below.

- Irritated
- Enraged
- Hostile
- Insulting
- Sore
- Annoyed
- Upset
- Hateful
- Unpleasant
- Offensive
- Bitter
- Aggressive
- Resentful
- Inflamed
- Provoked
- Incensed
- Infuriated
- Cross
- Worked Up
- Boiling
- Fuming
- Indignant



Figure C.16: Experiment Screens

We want to remember you that due to your participation you will receive 10 dollars (in 5 dollars gift cards from amazon), and we want you to answer a last question, please read the following message:

Considering the problems of drug war, corruption and inequality in Mexico, there are organizations which main objective is to help victims that suffer from poverty and marginality , for example some help people affected by the drug war in Mexico. One of the institutions is Caritas Mexicana which a catholic organization that works to build a better world, especially for the poor and victims of catastrophes in Mexico. Caritas Mexicana is part of Caritas Internationalis.

Several people in Mexico are in struggle and some are the victims of drug war in Mexico. Caritas Mexicana protects the confidentiality of applicants, but here are brief descriptions of the families, which names excluded:

1: A single man in his thirties, with two brothers, a disabled kid (20 years old) and a young female of 25 years old pregnant. He is unemployed and lives in poor community in Aguas Blancas, a place where years ago a massacre happened were he lost his parents in 1995.

2: A single mom who lives with her 3 children and her Mother. Her kids' ages are 4,2,5 months. She lives in Iguala Guerrero.

3: A single man is on disability after a shooting with police and has struggle with drugs. He used to sell drugs on the street. His family is taking care of him, his father is a painter, and his mother works in a convenient store as cashier. Both are in ages between 50-60 years old.

4: A single mom with 3 kids ages 14,11, 9, she used to work in government but she was fired because she notice that her boss was involve in acts of corruption and she decided to accused him. She is 45 years old and unemployed.



100 percent of the money collected will go to help the victims. Caritas Mexicana has already decided, based on each case, which of the victims that we have just described need it more. If you wish to donate any of the \$10 dollars that you got by participating in this survey to help the victim that Caritas Mexicana has chosen, please select the option that you wish to donate.

\$10

\$5

\$0



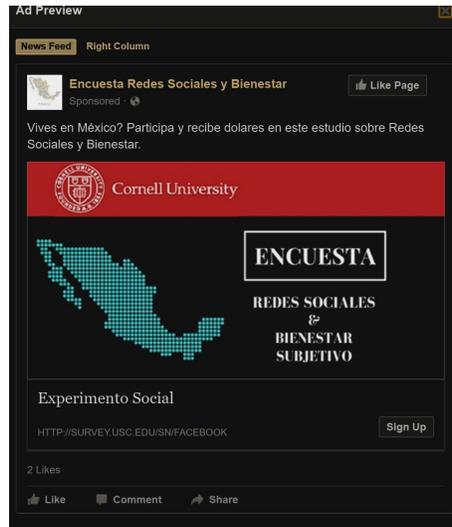
## Figure C.17: Experiment Screens

Here are the codes of your lottery gift card and all your gift cards. You will receive the complete \$10 dollars gift cards (in \$5 dollars Amazon gift cards). We register your decision to donate or not to test your altruistic behavior. This is the end of the survey. We appreciate your time and cooperation to answer these questions. The data collected will provide useful information regarding the well-being of Mexicans

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Thanks again for your participation!  
This is the end of the interview.

Figure C.18: Facebook Ads: News Feed and Right Column of Desktop Users



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