THE ROLE OF AVAILABILITY CASCADES IN TOURISM DECISION-MAKING

A Thesis

by

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ABSTRACT

Momentum from a single tourism event can produce a pattern of mass perception. Availability Cascades are processes of collective belief formation where natural social learning causes individuals to incorrectly infer the probability of a proposition. The thesis measures an individual's level of negative affect after selecting an initial tourism choice, seeing contradicting group judgments, and selecting a final opinion.

In the absence of confounding variables, emotions were observed to be intrinsic incentives that completely predicted the strategies by which individuals reacted to their social groups. Those who experienced negative affect after seeing disconfirming opinions ($p = .007$) were able to assuage this emotion by conforming ($p < .001$). For those who did not conform, there was an intrinsic and emotionally positive response after observing a social group contradict their views ($p = .02$). Strengthening an opinion against all social signals allowed these "non-conformers" to maintain confidence in their personal perceptions, however, committing to this final decision increased negative affect ($p = .01$). Without any direct emotional meta-data or tangible rewards for conformity, risk-averse proportions remained stable across groups—so threats were not a factor in the choice. This means choices were dictated by individuals' emotional reactions to their social groups. If future tourism research can offer insights into how to change non-conformers' initial reactions to their social signals, then a proposition could be guided towards collective consensus irrespective of whether the risk is perceived or real.

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CHAPTER I

INTRODUCTION

In tourism, one instance of a threatening event such as economic instability, food poisoning, or terrorism can evolve into a collective and pervasive perception of danger. Consequently, reputations can suffer as an institution's credibility is diminished. A lack of demand can contribute to a loss of visitors. This may result in a loss of revenue and cause sustained damage irrespective of whether the risk is real or perceived. In contrast, some places may receive more approbation than is warranted by objective evaluation. They may become popular tourist destinations, not because they are superior, but because others express this sentiment.

Beliefs about quality, reward, threat and experience are all inferences, or conclusions made about a degree of probability (Bikhchandani, Hirshleifer, & Welch, 1992). Is it probable that brand A is better than brand B, that Italy is a good vacation destination, or that harm will come to a traveler if he or she visits a recently attacked country? Each statement is a likelihood estimate, or belief, about the world. Individuals' views are influenced by the external choices of their social group.

Witnessing a person's public choice causes others to perform a cost-benefit inference through which they determine the merit of this action (Bandura, 1962). When an initial few followers extrinsically adopt this expression, it provides the social validation necessary to signal both that the action is safe to follow, and provides value (Bandura, 1963). These decisions are frequently predicated on learning from, and instinctively imitating the choices of others (Bandura, 1971a).

Patterns of mimetic behavior often explain classical micro-level decision-making processes in economics (Tversky & Kahneman, 1974), asset market investments (Scharfstein & Stein, 1990), political elections (Bikhchandani et al., 1992), legal precedents (Kuran & Sunstein, 1999), the adoption of new technologies (Walden & Browne, 2002; Yoav & Shchori-Bachrach, 1973), and mathematical decision theory (Nash, 1951; Von Neumann & Morgenstern 1944). As more instances of a behavior are observed, the likelihood an individual will mimic these actions often increases (Bandura, 1977). As more people adopt this behavior, it rises in value. Each favorable opinion adds a modicum of social proof until an individual's threshold for action is reached. By joining in, a person externally communicates this same proof to his or her spheres of influence (Bandura, 1986). For example, friends communicating the virtues of a new cruise company may persuade an individual to travel, and then relay this proof to others.

Observing the actions publically displayed by a social group often cognitively influences its members to think similarly (Bandura, 1962). Social learning causes individuals to imitate the actions of their social group because it provides the greatest number of instances from which to infer the probability of reliable beliefs and actions. As a result, natural clusters form which share common perceptions and beliefs about the world. Since the endorsements gained through social interactions communicate value, this allows individuals to make risk-averse decisions by trusting the perceptions others have gained through personal experience. Which brands are high in quality, which destinations are safe to visit, and which franchises to support are all *beliefs*, which are learned, formed and revised through social networks (Akers, 1977, 1998; McGuigan, Makinson & Whiten, 2011; Skinner, 1953).

Often, individuals imitate others because they assume the group choice is most likely to provide them with benefits (Banerjee, 1992). A commodity, person, or proposal, which many publically express as desirable, often communicates it is worthy of time, effort and money (Becker, 1991). For example, when people gather around a street performer, the congregation grows as passing individuals infer from crowd size that the act is worth their time and stop to watch. Lines outside a restaurant connote good value. A gradual standing ovation occurs in a theatre when audience members receive social signals from those around them and sequentially respond by displaying their endorsement. As an action becomes more prominent, it is assumed to have more value and more people embrace it. In summary, value is inferred from popularity: the more a consensus grows, the stronger its influence becomes (Banerjee, 1992). Conversely, if there are few supporters of a proposition, it implies more risk (Becker, 1991).

In these situations, the cognitive probability inferred is influenced by the concept of *Availability*, which was identified by Tversky & Kahneman (1974). They defined the Availability heuristic as assessing "the probability of an event by the ease with which instances or occurrences can be brought to mind" (Tversky & Kahneman, 1974, p. 1127). This may occur, for example, in mastering the social manners at a dinner party in an unfamiliar culture, which potential social positions to embrace, or how to process the latest news event. For example, as sequential guests select a certain dinner fork for a particular course, it becomes increasingly reasonable this is the proper action. The group behavior is assumed to be the correct behavior because of the sheer number of individuals who accept it. Therefore, it is natural to be influenced by the number of times a behavior is displayed within a group.

Decision scientists, legal scholars and academics have formalized this phenomenon in a multi-disciplinary effort to explain collective beliefs and actions (Anderson & Holt, 1997; Cheng, Adamic, Dow, Kleinberg, Leskovec, 2014). It is conceptualized as a chain of deciding actors who conform to previous choices based on availability (Cheng, Adamic, Dow, Kleinberg, Leskovec, 2014; Fowler & Christakis, 2010; Hung & Plott, 2001; Pollock et al., 2008; Watts, 2002;).

An *Availability Cascade* is a "self-reinforcing process of collective belief formation by which an expressed perception triggers a chain reaction that gives the perception increasing plausibility through its rising availability" (Kuran & Sunstein, 1999, p 683). As this chain increases in quantity, the public actions of others are assumed to be a good indicator of what individuals think (Bikhchandani et al., 1992). The phenomenon occurs primarily because collective consensus is comprised of individuals who have relatively little *private information* and converge toward similar opinions based on the *public information*, or choices, of others (Bikhchandani et al., 1992).

For example, a man lines up at a selected door to wait in line for an attraction to open. A second person assumes he knows this is the correct place to stand. A third individual is considerably less likely to question the action, while the fourth can "clearly see" this is the line. Without knowing anyone's *private information*, the beliefs of the individuals behind the early few are reasonable data on which to base their conclusion. However, in some cases the initial instigators of the behavior do *not* know the correct action so everyone later in the queue has incorrectly inferred this is the correct line. The difficulty with a growing chain is individuals cannot verify earlier choices and its validity

is increasingly less likely to be challenged (Bikhchandani et al., 1992). A critical question becomes, when is it rational to "follow the crowd" and when it is rational to oppose them?

In tourism, there are examples where a single instance of food poising drives a franchise out of business. When a plane crash is reported in the news, some individuals assume all airlines are dangerous and select other means of transportation (Kahneman, 2011). Terrorist attacks in foreign countries engender fear, which results in public avoidance of the country for years. Economic challenges, safety concerns, branding efforts, and marketing campaigns all shape individual perceptions and are transferred through social networks to become collective beliefs about the world.

A central thesis of an availability cascade is that each person is both learning from and imitating previous members of a chain, which means more human agreement doesn't necessarily equate to a higher probability of truth (Bikhchandani et al., 1992).

Which propositions violate the law of large numbers and which are good notions to accept because a threshold number of people believe them? In the context of tourism, how do honorable institutions steer incorrect mass beliefs toward accurate conclusions? When instances of banking crises, riots, or destination threats multiply, what are the mechanisms an institution can employ to avoid reputation damage, loss of visitors, and communication errors? In order to control the dynamics of mass perception, it is necessary to understand the forces that drive the personal decisions of individuals. Discovering these mechanisms would allow public cascades to be shaped in a way that leads an individual to the objectively correct conclusion.

Availability cascades are powerful forces driven by the cognitive and emotional processes that effect human decision-making. They subsume two subgroups: Informational and Reputational cascades. Informational cascades are cognitive processes that influence the probability an individual will come to the group conclusion based on the number of decision-makers (Bikhchandani et al., 1992). Such cascades may endure indefinitely due to the group overpowering personal opinions, but may dissipate easily due to this conformity. If a collective opinion is able to overcome an individual's choice, this allows cascade beliefs to rapidly change as their social equilibrium shifts (Bikhchandani et al., 1992). As more people socially embrace another view, it increases the number of mental instances in support of individual change and becomes more likely.

A Reputational Cascade occurs when individuals emotionally desire to avoid social pressure, and seek to maintain their status within a social group (Kuran & Sunstein, 1999). This enables them to retain group benefits and avoid negative affect.

Within psychological and sociological literature, there are two main opposing theoretical forces that determine whether individuals follow, or reject availability cascades. One body of research shows the need to reinforce a personal belief despite being exposed to all counter-evidence (Nisbett & Ross, 1980; Ross, Greene, & House, 1977; Rozenblit & Keil, 2002; Sherman, Nelson, & Steele, 2000). From a desire to view oneself as logical, coherent, and competent, individuals show a predisposition to ignore all evidence contradictory to a personal opinion (Harris & Napper, 2005; Lecky, 1945; Sloman & Fernbach, 2017; Vallone, Ross & Lepper, 1985).

Another large body of research shows a desire for conformity *without any personal gain* (Campbell-Meiklejohn, Bach, Roepstorff, Dolan, Frith, 2010; Klucharev, Hytönen, Rijpkema, Smidts, Fernández., 2009; Nook, Lindquist, & Zaki, 2015; Yu & Sun, 2013; Zaki, Schirmer, Mitchell, 2011). Kuran & Sunstein (1999) theorize cascades have a stopping point called, *Expressive Equilibrium,* when there are no additional incentives to believe a proposition. The question of personal reward is critical, because if conformity occurs without incentives, it is a natural desire and suggests cascades can continue in perpetuity. Without any tangible incentives to conform, reputational cascades suggest emotion is the main incentive to agree with the group (Kuran & Sunstein, 1999). Yet emotions are also at the center of the confirmation bias, which allows individuals to reinforce their personal opinions. When will individuals choose to reinforce an opinion, and when will they think it is rational to follow the majority choice? When a group belief contradicts a personal belief, do emotions dictate the process individuals use in order to make a conforming decision?

Several questions arise out of the psychological and sociological processes endemic within Availability Cascades. (1). Is conformity natural? Will individuals accept beliefs simply because those in their social network do? This emphasizes a social group's natural ability to cognitively and emotionally influence decision-making. (2). If the self-concept needs to be protected, is the desire for conformity stronger than a desire to reinforce a personal belief? (3). If humans are threat averse and conformity is natural, how much negative emotion is produced from disagreeing with the majority? Do some individuals have different emotional reactions to disagreeing with a group and does this effect their decision?

While previous research has explained the general concepts of a cascade (Bikchandani et al., 1992; Kuran & Sunstein, 1999), this research *measures* the emotional dimension individuals feel when learning from groups in order make decisions.

In the context of tourism, understanding what role emotions play in cascades and decision-making when threatening events occur is vital to the success of maintaining reputational standing, consumer confidence, and public relations. Chapter II comprises an in-depth examination of extant research used to explain a cascade, while Chapter III offers a conceptual development of the theories that lead to the study's hypotheses. Chapter IV describes the procedures and methods of the experiment. Chapter V contains the results, and Chapter VI discusses their implications.

CHAPTER II

OVERVIEW AND EXAMPLES OF AVAILABILITY CASCADES

The Role of the Availability Heuristic in Decision-Making

The human mind is a temporal structure with a finite amount of mental energy with which to process, reason and problem-solve (Conlisk, 1996; Miller, 1956; Sweller, 1988). Therefore, the brain seeks to conserve its mental energy for future cognitive tasks (Paas, 1992; Paas & Merriënboer, 1986; Slagter, Lutz, Greishar, Francis, Nieuwenhuis, Davis, Davidson, 2007). This limitation is addressed by developing cognitive shortcuts called heuristics. They are psychological tools meant to economize the mental effort used in decision-making tasks (Tversky & Kahneman, 1974). By quickly forming a perception, these 'rules of thumb' can expedite learning at the cost of thoroughly investigating each element in a decision (Dixon & Clarke, 2013). Dual process theory is the term coined by Kahneman (2011) to explain one "system" of thinking which generates impressions, is a network of highly associative connections and is biased to confirm and believe. It operates as an involuntary process, the automaticity of which occurs with zero or little effort. In contrast to its counterpart "system 2" which is slow and methodical, system 1 has an uncritical acceptance of suggestions, is prone to jump to conclusions, and saves cognitive energy at the occasional cost of a mistake.

However, while it expedites decisions under uncertainty when there are constraints on time and effort, they can "sometimes lead to severe and systematic errors" (Tversky & Kahneman, 1974, p. 1124). When a complex decision is not processed thoroughly, misconceptions may ensue.

The availability heuristic is defined as the fallacy of assessing "the probability of an event by the ease with which instances or occurrences can be brought to mind (Tversky & Kahneman, 1974 p. 1127). Contingent on *retrievability*, those examples that are easier to recall will be incorrectly judged as more numerous than events of equal or greater frequency despite objective statistical probabilities to the contrary because they are more easily retrieved from memory (Schwarz, 1998, 2004). For example, in the context of tourism, the risks associated with shark attacks, terrorism, or avian flu, often are inflated by high levels of media coverage (Kahneman, 2011). This may cause individuals to avoid visiting whole countries when only a single localized incident has occurred.

The use of this heuristic, whereby an individual bases the probability of a proposition's truth on its availability for recall, is especially likely to result in erroneous conclusions (Tversky & Kahneman, 1973). The tendency is to consider only examples of the event occurring, while not envisioning any examples where the event did not occur (Aarts & Dijksterhuis, 1999). This disproportionately weights the balance of probability in favor of the proposition (Kahneman, 2011). For example, when more instances of people falling off cruise ships are reported, this becomes a public fear despite having a low probability. When a violent incident in a foreign country is reported, the destination is perceived to be unsafe, despite statistical data indicating it is relatively safe compared to competitive destinations that have not had such a high profile incident reported. Since judgments are based on the myopic viewpoint of an individual's experience, rather than a larger more accurate aggregation of information, the availability heuristic may mislead rather than inform (Tversky & Kahneman, 1979).

The Formation of Availability Cascades

Since individuals seek to conserve mental effort, they often rely on others in a social network to inform their views. An individual belief is transferred to others sequentially, and as its availability rises it becomes a group belief. Availability Cascades "trigger a chain reaction that gives the perception increasing plausibility through its rising availability in public discourse" (Kuran & Sunstein, 1999, p. 685).

As sequential decision makers in a social sphere are exposed to a belief, others accept the proposition's legitimacy and a pattern of acceptance becomes normal (Bikchandani et al., 1992; Kuran & Sunstein, 1999). After the first person believes, the second, despite reservations, might believe based on the previous signal. As the number of individuals making decisions increases towards infinity, the probability of a proposition's perceived truth within a cascade increases towards a perfect 1 (Bikhchandani et al., 1992). As more people believe, the notion receives more strength and, thus, more people are likely to believe it. The use of the availability heuristic means the proposition need not be true; only that others perceive it to be true.

This availability cascade cycle is defined as a "self-reinforcing process of collective belief formation" by which expressed perceptions become more probable as an increasing number of individuals espouse them (Kuran & Sunstein, 1999, p 685). Each adopter strengthens the subsequent individual's signal until it becomes unthinkable that the majority could be incorrect. Individuals' doubts weaken as the number of adopters increases. As a belief gains more popularity, it gains more probability. This means cascades often override private judgments—sometimes regardless of counter-evidence—and can lead to intractably false public perceptions that may be detrimental to a to

society. Since cascades rely on information from others in a group, an individual lacks the "means of judging a claim's validity" so there is a risk that "the beliefs generated by a cascade will be factually incorrect" (Kuran and Sunstein 1999, p. 713). Information is progressively disregarded as individuals later in a queue simply follow the public choices of others. The danger is that large portions of society, "potentially even all, will end up with essentially identical beliefs" (Kuran and Sunstein, 1999, p. 686).

Bikhchandani et al., (1992) show the power of this notion through cascades by illustrating their probability. For example, tourists may be narrowing their choices between two restaurants, A or B. The general public favors A 2% more than B. Given these preferences, there should be almost an equal number of people who choose to eat at each restaurant. As individuals arrive, they receive a *signal,* or a social cue, from those before them to eat at A or B. When selecting an establishment, it is natural to look for the one with the greatest aggregation of people. This popularity connotes quality. Assume 99 out of 100 people have a private signal that indicates a preference for A, but one person prefers B. If the B supporter arrives first, a second person who may pick A or B infers his or her social signal from the previous person, and selects B as well. The third similarly chooses B, as does everyone else behind them (Becker, 1991; Banerjee, 1992). In this way, it becomes extremely easy for an incorrect cascade to occur in which mass behavior shapes public sentiment against overwhelming private opinion (Bikhchandani et al., 1992, p 1001; Banerjee, 1992). The preferences of individuals are not reflective of what they intrinsically think because each person is making choices based on their inferences about others.

Tourism Example #1 The Dutch Egg Epidemic

In July 2017, the Belgian government accused Holland of having known for almost a year about an insecticide called Fipronil in their eggs. It became public knowledge on July 22st 2017, when the Dutch government temporarily closed 180 farms involved in the production of tainted goods, which produced an estimated 40 million eggs per week (Are Europe's Eggs Safe to Eat, 2018). They arrested two men in the process.

Wageningen Agricultural University estimates Holland exported around €502 million eggs in 2016, while Eurostat estimates €350 million (Dutch Egg Exports Hit €347m Last Year, before the Fipronil Scandal, 2017). This is shown in **Figure 2.1** below.

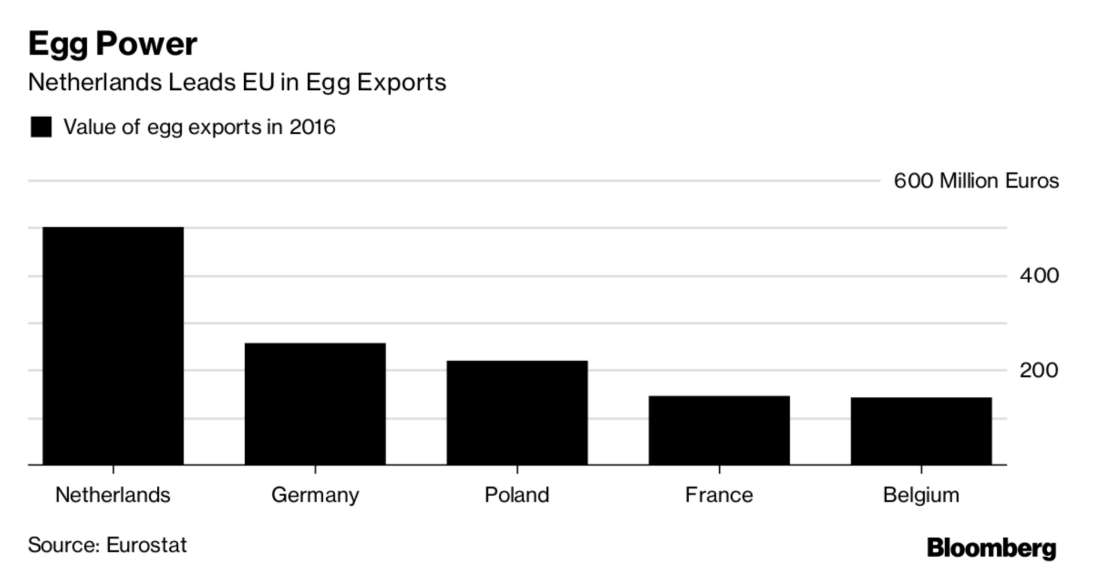

Figure 2.1 Netherlands Egg Exports
Europe's Tainted Eggs Seen Hurting Future Trade for Netherlands, Manisha Jha and Helen Chandler-Wilde, August 15, 2017. Reprinted from Bloomberg.com.

Since Holland was one of the largest exporters of eggs in the world, news spread quickly. Nations started to test their eggs and publically announce their findings. After

the Netherlands, Belgium, Austria, the UK, Germany, Luxembourg, France, Sweden, Switzerland and Romania reported finding the insecticide in their eggs. More countries followed; by the time discovery was finished in Europe only Croatia and Lithuania were found to have compliant eggs, among the 28 EU member states. In total, 49 countries reported contamination. Almost 600 notifications were sent to the EU's Rapid Alert System for Food and Feed products (RASFF) (Fipronil in Eggs – Another Food Issue in Europe, 2017).

The Guardian reported Johan van Bosch, the secretary-general of the Belgian Association of Egg Wholesalers, said the product is "sold all over the world but our first export market is Africa" adding "the market is anything but stable, with the contamination crisis spreading by the day" (Belgian Chicken Meat Exported to Africa Is Tested for Banned Insecticide, 2017). Ukraine and Oman imposed import bans on several western European countries and contamination was found as far as Hong Kong (Food Safety Auth. Under Fire in Parliamentary Debate on Egg Crisis, 2017).

Initially, the United Kingdom estimated 21,000 eggs had been imported from their neighbors. However, this number rose to 700,000 in a short period. Despite assurances that this latest estimate was .007% of the number of eggs consumed per year and that more than 85% of eggs were grown locally, consumer confidence did not rise (Fipronil in Eggs – Another Food Issue in Europe, 2017). Grocery chains Rewe, Aldi, Lidl, and Penny, pulled all eggs regardless of infection off the shelf to bolster consumer confidence. Soon, a host of others followed.

If eggs were poisoned, it was likely that egg products may also be poisoned. Thus, companies pulled all poultry products from the shelf to quell fears. Holland

exported between €350 and €500 million euro in eggs, but its market share of poultry products was much higher. This is shown in **Figure 2.2** below.

Dairy and egg products in total for 2016 were around €6 to €7 billion (Figure 2.2)

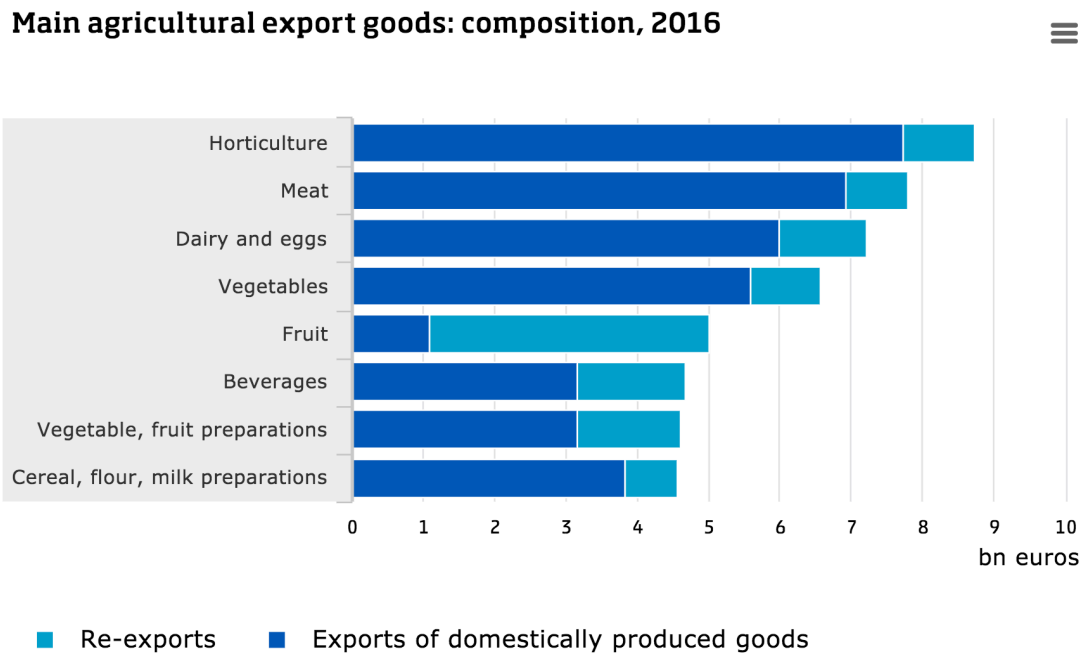

Figure 2.2 Main agricultural export goods, 2016 (Centraal Bureau voor de Statistiek Netherlands, Agricultural Exports Increase January 20, 2017). Reprinted from Centraal Bureau voor de Statistiek.

With 26 of the EU member states, and a total of 49 countries reporting infection, subsequent arrests of the perpetrators; widespread media coverage and general mass panic, it seemed likely that most reasonable decision-makers would consider this a public health risk. Availability cascades convince individuals that with more instances of repetition, it becomes increasingly likely a belief is true. In this example, not only was cognition affected by the number of instances a government publically communicated

danger, but by the emotion it evoked. Since individuals are risk-averse (Kahneman, 2011) they prefer to minimize their exposure to harm.

A quick Google search for "Holland Fipronil" comes up with headlines like "What you should know about Toxic Eggs found in 12 German states", "Millions of eggs removed from European shelves over Toxicity Fears", and "Belgium admits it knew about contaminated Dutch eggs back in June". These are all framed in a way that assumes danger, or publically announces the risk without explanation. Articles list a range of potential negative outcomes from everyday pains to fatal symptoms. This heightens fears on an emotional level.

The Dutch Government made repeated attempts to assure the public there was no danger and their attempts were reinforced by similar messages from health organizations and other government officials. This is the message these institutions publicized:

1. Contaminated eggs were exported, sold and eaten for more than a year after Fipronil was introduced into products. In that time, no reported cases of death or injury were found. In addition, no reported cases of harm to individuals in any context were identified. After extensive investigation, authorities detected no instances of any effect and have discovered none to-date.

2. The European Commission's Health and Food Safety Directorate-General says the number of non-compliant eggs in 2016 decreased "from 25% in the week of 24 July to 1% in the week of 22 August" (Summary Report of the Standing Committee on plants, animals, food and feed held in Brussels on 30 August

2017). So the swift action of the Dutch government to shut down around 20% of their farms implicated in the health risk decreased the infected production areas to 1%.

3. This precipitous decrease in infection was due to an efficient system. Egg products can be traced back to the farm of origin as each package has a specified code. This makes it possible to track the exact stores where the products from infected farms traveled were sent and to recall them.

4. The reported levels of poison on farms exceeded the legal limit by kilograms. This made recall a legal requirement, but did not constitute an eminent health risk. Two arrests were made for the illegal action of using the substance.

5. Taking the highest level of Fipronil measured in Belgium, 1.2 mg Fipronil/kg, an adult with a body weight of 65 kg may could eat seven eggs in one day without exceeding the health guidelines (Federal Ministry of Food and Agriculture, 2017). The German food standards' agency said exceeding this health reference did not necessarily pose an acute health risk, but indicated consumers' possible exposure (BfR). Toxicologist Martin van den Berg said it would be harmful only if you ate them every day throughout your life.

6. Chris Elliot, director of Institute for Global Food Security and professor at Queen's University Belfast said, "This scam is a disaster for the egg and food

> industry in the Netherlands and they will struggle to retain market share due to the loss of trust and this will give a good opportunity to rivals to capture their market share," (Dutch Egg Exports Hit €347m Last Year, before the Fipronil Scandal, 2017).

Impact on the Price of Eggs

The governments of "Belgium, Holland, Italy, the UK and the US all highlighted the recent fraud scandal involving Fipronil" (AI, Fipronil and Welfare Issues Dominate IEC Reviews, 2017). As the threat implied risk, shortages in demand led to price increases. The "shortage of eggs in Belgium would lead to higher prices that many customers did not want to pay, while the UK has had to work hard to defend British eggs and Dutch farmers face ongoing legal challenges". (AI, Fipronil and Welfare Issues Dominate IEC Reviews, 2017). Philip van Bosstraeten, director of Ovobel, which supplies equipment for the egg industry, said there was a great deal of uncertainty from customers and the price of eggs had already risen 10 percent in the early periods of the "crisis" (German Supermarkets Ban Dutch Eggs over Poison Scare, 2017). Another source said, "In Germany, eggs are currently 88% more expensive than this time last year, while in Holland and Belgium prices are 92% higher" (Dutch Poultry Farmers Sue over Fipronil Crisis, 2017).

Cost of the Cascade

The *Netherlands Times* reported that the initial destruction of the infected chickens and eggs from Dutch Farms alone was estimated to cost €33 million (Food Safety Auth. Under Fire in Parliamentary Debate on Egg Crisis, 2017). This estimate does not include non-farmers in the poultry sector, nor does it take into account future losses.

Subsequent estimates rose to €66 million (Fipronil Saga Cost Dutch Poultry Industry over €66m, 2017) and damages to poultry farmers were estimated to be €150 million early in the process (Farmers to Lose Millions of Euros as Fipronil Scandal Widens, 2017). Overall, the European Commission's egg market analysis showed Holland reportedly lost 7.5% of their market share in 2017, when production fell by 48, 000 tonnes. This means the total cost of the cascade to Holland alone was close to €450 million (Fipronil Scandal: Belgian Egg Farmers to Get Share of €30m, 2018).

The Dutch government conducted an investigation in 2016 and found no evidence of a public health risk. When accusations were reported in 2017, they reacted in a way that utilized best practices in risk management. By reacting quickly to the panic, the Dutch government was able to decrease the area of influence to 1% of farms. Ministers publically announced the safety of the recall and the low number of non-compliant eggs. Yet after performing all of these counteracting measures, nations still publically and sequentially followed the actions of their predecessors by learning from the cues they observed. Despite employing all the correct methods for prevention, the collective belief of food poisoning spread and was sustained into 2018.

By discovering the processes that govern these decisions, institutions will be better equipped to employ tactics that succeed when a traditional risk management strategy fails. Theories of risk management techniques are intended to minimize threat, not necessarily to shape perception. Beliefs like these are formed in spite of all the corrective health evidence provided. Beliefs have an emotional component, which traditionally has not been considered in the decision-making or behavioral economic literature.

Affective Influences of Cascades

Instances like the Dutch Egg Crisis can be blamed on fear mongering or emotions, which are often thought to be irrational or harmful. When institutions implement risk management polices that are limited to cognitive explanations, they are often ineffective. Individuals often make risk-averse decisions by looking to their social networks. Social networks feel an obligation to warn other group members about threats (Bench, Lench, Darbor, Moore, 2015). This is a rational process, but sometimes leads to the inflations of risks as they are reiterated within social groups.

Affective Research suggests that emotions are natural and logical group signals to follow the majority choice. Often, individuals must attain unanimity within a group when making collective determinations. Since the affective component of mass consensus is a large factor, it is surprising that emotions were not considered in most of the Twentieth Century decision-making literature (Keltner & Lerner, 2010, Loewenstein & Lerner, 2003), which focused only on the cognitive dimension of decision-making (Kahneman & Tversky, 1979).

Recently, affective processes have been considered a major driver of most choices in the decision-making process (Ekman, 2007; Frijda, 1988; Gilbert, 2006; Keltner, Oatley, Jenkins, 2014; Loewenstein, Weber, Hsee, Welch, 2001; Phelps, Lempert, Sokol-Hessner, 2014). Published research on the role of affect in decisions doubled between 2004 and 2007, and again from 2007 to 2011 (Lerner, Li, Valdesolo, & Kassam, 2014). Nevertheless, a recent review of affective literature stated, "research on group-level emotional processes is surprisingly scant, given that so many high-stakes decisions are made in groups" (Lerner, Li, Valdesolo, & Kassam, 2014).

Although "members tend to feel happy and to enjoy groups that have a shared sense of reality, such feelings are associated with groupthink—the destructive tendency to minimize conflict and maximize harmony and conformity (Janis, 1972). Given that general positive and negative emotions can spread through social groups and influence performance outcomes "considerably more research in this area is needed, especially at the level of specific emotions" (Lerner, Li, Valdesolo, & Kassam, 2014).

In order to understand the process by which availability cascades occur and individuals reason through choices, it is imperative to have an understanding of both reason and emotion. Nobel Laureate, Herbert Simon, introduced the concept of bounded rationality, redefining existing models of normative choice. Yet, he knew his model was incomplete with regard to emotional influences. He says, "In order to have anything like a complete theory of human rationality, we have to understand what role emotion plays in it" (Simon, 1983, p. 29).

Since much of the historic microeconomic literature does not factor rational emotional processes, or cognitively influenced social learning into its models of

behavioral economics, they fail to accurately predict human movements toward collective action. Accurately understanding the role emotions play in cascades can help illuminate the means by which institutions can steer the public toward accurate decisions and away from false conclusions. This was seen in the example of Morocco and Egypt during "The Arab Spring". Similar riots and violence in both countries produced opposite tourism outcomes as governments responded differently, shaping the public perception of threat.

Tourism Example #2: Morocco and Egypt

The "Arab Spring" was a period of civil unrest that began on December 17th, 2010 in Tunisia and spread across twenty countries. As protest behaviors emerged, more nations imitated them. As media reported instances of the threat increased, so the perception of danger increased for visitors.

While hard repression is the use of force to crush the opposition, soft repression refers to the nonviolent methods to eradicate oppositional ideas (Ferree, 2005). Governments can use forms of "soft repression" (Francisco 2005), which is synonymous with covert action (Goldman & Lukes 1977). Egypt met riots with harsh oppression, using water cannons to disperse crowds. In stark contrast, Morocco announced constitutional reforms through a national referendum; created a council to hear grievances; and established a location for regular protest activity. National state television reported positive stories, and the Moroccan monarchy did not meet the protests with violence. It does not matter whether these grievances exist in reality or are perceptions; rather it is the manner in which grievances are interpreted and publicized that matters (Snow, Rochford, Worden, & Benford, 1986). By changing the way people

interpret their beliefs, the monarchy was able to create the perception that changes were being implemented. This created a sense of security, even though there was war in the region.

Beliefs are of varying levels of importance to a person's self-concept. Some are central, while others are peripheral. In order to join collective action, this belief has to be important to a person's sense of self (Viterna, 2009). Similarly, some beliefs have a central number of core tenets that must develop credibility to survive. The higher the belief in the hierarchy, the easier it is to mobilize (Snow & Benford 1988). The unrest in Egypt was framed as a national populist movement against the regime, in which protest support was analogous to Egyptian "patriotism". In contrast, the prominent ideology in Morocco was that state citizenship meant "royal subject-hood". Framing national identity this way led to an ideology in which desires of the people directly conflict with the notion of dethronement and rebellion. These injustice frames expressed the wrongdoing of responsible parties (Gamson, Fireman, and Rytina 1982; Piven and Cloward 1979). Thus, similar beliefs produced two different outcomes. Rebellion in Egypt resulted in the overthrow of an unjust government fueled by national pride, while patriotism in Morocco led to public support for the Monarchy and governmental reform.

Not long after protests began, US press secretary Robert Gibbs, former president Jimmy Carter, leaders of the UK, Germany, and France denounced the violence in Egypt and the EU called for fair elections. Following these actions, worldwide investors withdrew their money from Egypt. Meanwhile, Standard & Poor's credit outlook for Morocco remained stable and support for its reforms came from international sources. Not all beliefs have a geopolitical component (Snow, Soule, & Kriesi, 2004), however

movements are highly effective when eliciting the support of international governments and aligning frames with "global standards of justice" (Ancelovici 2002; Almeida & Lichbach 2003; Schulz 1998).

As a result, 9.5 million tourists visited Egypt in 2011. This was a decline of nearly 35% from the previous year and tourism revenue fell from $12.8 billion to $8.8 billion (Ali, Arifin, & Hasim, 2012). This was a loss of $4.5 billion. In Morocco, tourism rose 4% during the Arab Spring (Ali, Arifin, & Hasim, 2012).

When an institution is able to employ emotionally resonant countermeasures to a growing and harmful belief, they are able to assuage the emotional fear that risk-averse behaviors create among a social group communicating its fears. By denying his faults, the President of Egypt reinforced the negative emotions felt by a proportion of the population. This bolstered the opposition rather than assuaging its concerns. In contrast, by ostensibly creating a means of reform, Morocco was able to avoid violence, sustained riots, and dethronement, while sustaining international economic confidence and governmental control.

CHAPTER III

LITERATURE REVIEW AND HYPOTHESES

Availability Cascades are comprised of the mechanisms in **Figure 3.1**. These determine different dimensions of the process, such as the strength of cascade beliefs, the speed at which they multiply and the rate of their acceptance by the public. With greater levels of specific components, cascades can become stronger. For example, reputational protection is the diligence with which individuals or institutions govern the image they present to others. This can result in a reputational cascade. Individuals will often agree with others in a group because this would increase their reputation within that specific social milieu. Research on conformity shows this phenomenon is an intrinsic motivation. Innate conformity refers to the willingness to follow others, sometimes due to a need for social acceptance. If this is an innate desire of a small community, cascades can begin faster and maintain their strength. Furthermore, as individuals feel more self-uncertainty, they show a disposition toward agreeing with others in order to reduce this emotion. This is evident in social groups who share the same principles. By having a homogenous network, certainty may increase with more members and uncertainty may decrease.

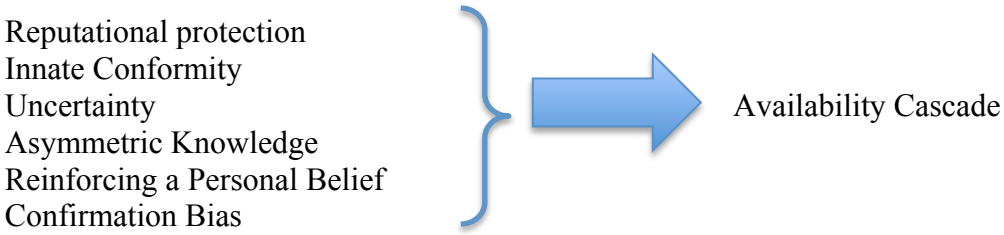

Figure 3.1 Psychological Mechanisms that facilitate Availability Cascades

When there is an objectively unequal level of information between individuals, or asymmetric knowledge, there may also be uncertainty. If a purchaser does not know the correct market rate for a piece of parkland, the seller has the competitive advantage. More knowledge of the price leads to more certainty in negotiating, while the purchaser's uncertainty about price may lead to a conforming decision.

Finally, there is a desire to select only information that supports a prior belief irrespective of the amount of evidence. Individuals reinforce a personal perception so that their self-confidence remains high and their self-concept remains consistent. Finally, cognitive dissonance is discussed. This theory refers to two conflicting ideas or opinions. When faced with two personal signals that are in opposition, an individual will attempt to reconcile them. This chapter discusses these mechanisms in detail. Hypotheses are discussed which pair the opposing mechanisms of innate conformity against reinforcing a personal belief. When these two are present in a cascade, hypotheses discuss the anticipated emotional responses of individuals.

Reputational Cascades

Cascades like these can be based on emotion and have a reputational dimension. A *reputational* cascade occurs when an individual agrees with the majority view in order to increase his or her reputation, despite holding a privately antithetical opinion (Kuran & Sunstein, 1999). In this case, there is a private expression, which is synonymous with *belief,* and the public expression of an individual, or the *actions* they convey to others. When exposed to a group, a person will alter his or her opinion to avoid social censure. This split is seen as the "widespread willingness to make behavioral or expressive

adjustments in the interest of improving one's standing" (Kuran and Sunstein, 1999, p. 725). Thus, individuals express false statements to gain social approval and avoid group punishment.

It is hypothesized that cascades eventually come to a stop when "individuals have no net incentives to alter the preferences or judgments they convey to others" and "by definition, the stopping point forms an *Expressive Equilibrium*" (Kuran and Sunstein, 1999, p. 743). While Kuran and Sunstein (1999) define this term as a cascade's endpoint, when individuals gain no profit. They recognize belief cycles can continue after this point. This means, even if an original source admits a story is false, the public may still believe it. Even if individuals have no "net incentives" to alter their opinions, cascades can still occur.

In the absence of tangible benefits, conformity is thought to be its own reward for some (Ferguson 1944; Rosner 1957; Kagan & Mussen, 1956; Strickland & Crowne, 1962) that is an innate *emotional* goal. Research in economics is based on the notion of individual utility, which designates "net incentives" as the basis for micro-level decision-making. However, neuroscientific research suggests that conformity may be a "natural" part of social life even in the absence of particular gains (Klucharev et al., 2009; Corriveau, Fusaro, & Harris, 2009; Nook & Zaki, 2015). Evidence indicates there might be intrinsic benefit if the brain is rewarded for conforming regardless of profit (Campbell-Meiklejohn et al., 2010; Yu & Sun, 2013; Zaki et al., 2011). This suggests it is an innate desire of individuals to conform.

Innate Conformity

When an individual or group influences another it is an act of conformity (Crutchfield, 1955). Most individuals are unaware of how much their beliefs are influenced by others (Cialdini, 2005; Nolan, Schultz, Cialdini, Goldstein & Griskevicius, 2008). If a clear pattern is present from previous actors, participants will tend to ignore their own preferences related to an outcome and adopt the preferences of the group, rationalizing the collective opinion is likely to be more probable (Asch, 1955; Jenness, 1932). A large body of research confirms these findings (Asch, 1956, Deutsch & Gerard, 1955). For example, it was reported that while participants' confidence levels remained constant with one opposing person, an increase in conformity occurred when two or three conforming individuals preceded a decision (Asch, 1952; Rosenberg, 1961). This literature demonstrates the role of social censure as an individual's private signals are often overruled by collective consensus.

A significant correlation has also been reported between a lack of self-confidence and higher conformity (Chen & Kaplan, 2003; Kaplan, Martin & Johnson, 1986), while high self-confidence and higher IQ (Tuddenham, 1959) scores tended to bolster participants against conformity. When self-confidence is low, individuals tend to trust others, group together, and conform to social norms. This suggests the emotional need for social approval is a major factor in conforming to group choice.

Early research showed that conformity might be a psychological pattern, and therefore a need for a proportion of the public (Ferguson 1944; Kagan & Mussen 1956). When individuals gave a personal opinion, and subsequently were shown mass opinion, participants shifted their views toward the majority. Those who conformed to the

collective on early trials also conformed later in the same trials and at later dates irrespective of the conformity task (Rosner, 1957). Strickland & Crowne (1962) suggested these results should be interpreted as the need for social approval.

By agreeing with the majority, individuals are allowed to retain access to group benefits. Conforming reduces emotional pressure or negative sanctions imposed upon the deviant. In this way, there is benefit to conforming and cost to deviation (Greenberg, Pyszczynski & Solomon, 1986; Jost & Van der Toorn, 2012; Rossenblatt, Greenberg, Solomon, Pyszczynski, 1989). This notion departs from conventional economic models as it ascribes an *emotional* value to reputation as a component of an individual's utility function. This dimension is critical because many choices are based on increasing self-efficacy and avoiding reputational damage.

Alleviating Self-uncertainty

Individuals are drawn to others who are more certain due to the belief that they must be correct, or have more information (Gibson & Hoglund 1992; Grant & Hogg, 2012; Hogg, 2014). Uncertainty-identity theory explains how feelings of *self*-uncertainty motivate people to identify with groups in order to alleviate this emotion (Hogg, 2016). The more unsure a person is, the more likely he or she will seek answers to the questions: Who am I? How do I behave? Who are others? and How should we behave together? The more uncertain individuals are about a belief, the more likely they are to be drawn by the views of others to a definitive psychological conclusion (Grant & Hogg, 2012).

Asymmetric Knowledge

When there are differing levels of information among people, this is termed *Asymmetric Knowledge*. Individuals do not know if others have more or less knowledge and this makes them uncertain. This "uncertainty arises from at least two sources: imperfect foresight and human inability to solve complex problems" (Alchian, 1950, p. 212). Imperfect knowledge means "the availability and the information cascade arguments both concern market actors reducing uncertainty about choices by imitating others" (Pollock et al., 2008, p. 336).

In response to uncertainty, individuals both develop personal precepts to enhance their confidence in decisions, and look to align with groups that re-validate personal decisions by giving credence to the phrase "if others believe this, it's probably true" (Asch, 1951). This is often illusory confidence. The mere cessation of reason offers a spurious feeling of "peace" as the cognitive load is sated and an opinion can be formed and held (Kahneman, 2011). A shared group ideology offers a sense of belonging and a validation of belief that reinforces the probability the tenets being promulgated are true. The greater number who hold this view, the easier it is for new members to hold (Hirsh, Mar & Peterson, 2012).

Tourism Example #3: Climate Change

Particularly salient is the notion of polarization, evident by the current division within American views on climate change. There are two groups, one in support of, and one that rejects the proposition of human contribution to climate change.

The general public receives most of its information about this subject from media sources (Nelkin, 1987; Wilson, 1995). As a result, scientific information is an "encoded

form of knowledge that requires translation in order to be understood" (Ungar, 2000, p. 308). Therefore, media outlets have the propensity to magnify occurrences, and endow them with meaning (Hall, 2002). An Availability Cascade "is a self sustaining chain of events, which can start from media reports of a relatively minor event and lead up to public panic and large-scale government action" (Kahneman, 2011, p. 142). When media cover these stories, it allows a selected perception to be amplified. As these issues are made available to more people, they are perceived to be more probable. The prevalence of modern communication platforms enables cascades to "gather momentum and overwhelm governments far more rapidly than was possible in the past" (Kuran & Sunstein, 1999, p, 762). This is due to medias' incentive to quickly publicize relevant stories so "a media outlet that exercises caution in reporting a frightening story may find itself at a huge, possibly irreversible, competitive disadvantage" (Kuran and Sunstein 1999, p. 750). Studies show this systematic informational bias by major American media outlets from 1988 to 2002 during which the scientific consensus on climate change debate was not accurately reported by some outlets (Boykoff & Boykoff, 2004; Boykoff, 2008).

Therefore, individuals who learn from different social spheres learn from different social sources of information, thus creating two groups divergent in their beliefs (Bandura, 1962). For example, climate change deniers might select only the information that fits their worldview, because considering empirical evidence might lead to the need for change in their group, opinion, or identity (Vallone, Ross & Lepper, 1985). Conversely, climate change supporters might only agree with the academic consensus because of a predisposition to believe in scientific consensus without personal

investigation. The more central a belief is to the identity concept, the more difficult it is to change the view (Ross et al., 1977). This is a natural process through which individuals learn to trust their media and social spheres to provide them with accurate information. By ascribing more validity to certain opinions, others are naturally vilified (Ross, Lepper, & Ward, 2010). These perceptions are reinforced so they become intrinsic beliefs.

Reinforcing Personal Beliefs

While conformity seems to be an intrinsic motivation, the tendency to reinforce an individual opinion is well established in the psychological literature (Hastorf and Cantril, 1954; Ross et al., 1977). Since self-views are trusted, perception is the foundation for all belief, rather than reality. For example, if a person is not logical, but *believes* he or she is a logical person, it does not matter if this is true. The individual will make decisions and express opinions based only on the views believed. This decreases the emotional weight of being "inconsistent" and the cognitive energy needed to resolve this disparity.

Self-categorization is a "cognitive process that is ideally suited to self-conceptual uncertainty-reduction" (Hogg, 2012, p. 64). Individuals only expend cognitive resources on resolving uncertainties that are salient in a particular identity context. So, if it is not important to a person's self-concept, they are less likely to want to resolve the problem. Instead of exploring every issue, each person explores just enough to self-conceptualize—figuring out "who they are"—and reinforce these confirmatory opinions to reduce uncertainty in the future (Hogg, 2014, 2016; Vallone, Ross & Lepper, 1985).

Confirmation Bias

Confirmation bias is the tendency to interpret new evidence as being confirmatory of existing beliefs, despite being exposed to contrary factual information (Vallone, Ross & Lepper, 1985; Nisbett & Ross, 1980). This makes it possible for individuals to be so convinced by a prior opinion that it is difficult to dissuade them (Ross et al., 1977).

When an identity role, action or behavior is affirmed, which aligns with a self-perception, there is consonance (Harmon-Jones, Harmon-Jones & Levy, 2015). When any attribute or belief an individual considers central to identity is not confirmed, this produces dissonance. There is an inclination to resolve dissonance with new information by ascribing some perceptional defect to others based on their inability to see how things "are in reality" (Harmon-Jones & Mills, 1999; Ross et, 1977, Ross et al., 2010).

If supporting a belief, person, or cause conflicts with the sense of self, confirmation bias helps to keep individuals psychologically safe from contradictory information that might threaten a self-constructed identity concept (Festinger, 1972).

Information contrary to the self-concept may be dismissed and suppressed, while ideas consistent with identity are sought, which creates and reinforces coherence at the cost of disagreeing information (Cohen & Sherman, 2007; Mcqueen & Klein, 2006; Steele & Liu, 1988). This is sought after because these evaluations "make the world seem coherent and predictable" and "promote the survival of their self-views" (Lecky, 1945; Swann & Bosson, 2011). Therefore, these cognitive biases can produce selective perceptions that create a distorted subjectively experienced social reality (Rozenblit & Keil, 2002; Sloman & Fernbach, 2017).

Cognitive Dissonance

When a group contradicts an individual's identity, belief, or action by challenging it, there is no longer coherence. Intellectual or behavioral deviance from a believed proposition creates a disconnect between these two opposing ideas called Cognitive Dissonance (Festinger, 1972).

The ways in which people perceive a situation are normative from a first person point-of-view (Ichheiser, 1949, Ross et al., 2007; Ross et al., 2010). Individuals prefer to have an accurate depiction of reality, a clear understanding of truth and valid opinions (Egan, Santos, & Bloom, 2007; Harmon-Jones, 2000). To hold a wrong opinion and be conscious that it is fallacious creates cognitive dissonance (Festinger, 1957). Dissonance occurs when an idea is divergent from the conception of one's identity or view and thus causes feelings of psychological discord (Festinger & Carlsmith, 1959). The theory asserts that although individuals have a propensity to hold conflicting opinions, once discovered, they will seek to either repudiate or psychologically reconcile them (Festinger, 1962). In order to correct the paradox between the way individuals see the world and contrasting viewpoints to which they are exposed, people will seek to mitigate cognitive dissonance by reducing or eliminating inconsistent behaviors and attitudes (Festinger, 1957; Festinger, 1972; Harmon-Jones, Harmon-Jones & Levy, 2015).

Self –affirmation is used to adapt to information and experiences that are threatening to one's self-concept (Cohen & Sherman, 2007; Mcqueen & Klein, 2006; Steele & Liu, 1983, 1988). It has been reported that individuals respond defensively to instances of self-threatening reports (Cooper & Fazio, 1984; Kaplan, 1986). A conclusion that ascribes blame to another party, allows individuals not to blame themselves (Gorman

& Gorman, 2016). This phenomenon is so strong that the amount of self-attributed bias is a "direct function of the amount of disagreement" between the self and the source (Pronin, Gilovich & Ross, 2004). Framing another group as being responsible reinforces the perception that the individual, or the group to which he or she belongs, is absolved.

Hence, there is a predisposition to emotionally conform by seeking social validation, and a need to maintain a positive view of the self and reinforce personal opinions. When a group disagrees with a personal belief, cognitive dissonance is produced. This dissonance is an emotional reaction. Below are three hypotheses in light of this discussion.

Hypotheses

The need to reinforce a personal belief and the desire to conform are both mechanisms by which individuals either accept or reject cascades. If these are in conflict, subjects will psychology attempt to reconcile them. When a personal opinion conflicts with a group opinion, cognitive dissonance occurs. In the proposed experiment, subjects will read news articles indicating an island is safe or unsafe. They will give an initial opinion after which, their level of negative affect (NA1) will be measured. After seeing a social group disagree with their views, NA2 will be measured. A final choice to remain with their original opinion, or change to the group choice will be offered and NA3 will be measured.

Since there is an intrinsic need to conform, it is anticipated that opposite group opinions will increase negative affect for all accept those who do not conform. Confirmation bias is anticipated to make these individuals feel better only after seeing the group disagree before they reinforce their initial opinion and experience increased negative affect. Hypothesis 1a and 1b describe the levels of affect as determined by the initial choices of safe and unsafe. Hypothesis 2a and 2b describe the levels of affect "conformers" feel, or those who change their initial opinion to the group choice. Hypothesis 3a and 3b describes the levels of affect for "non-conformers" or those who reinforce their initial opinion. Hypothesis 4a and 4b describe the initial and final opinions of both conformers and non-conformers. The issues of risk-aversion, self-concept and group conformity all play a significant role in an individual's choice to conform or deviate from a collective belief.

- **Hypothesis 1a: Negative affect will increase for A, "Safe", selectors after seeing their disagreeing social group.**
- **H1b: Negative affect will decrease for B, "Unsafe", selectors after seeing their disagreeing social group.**

If social groups influence individuals, then those who choose safe and see a disagreeing group choose unsafe will have more negative affect. Those who select unsafe, should feel more positive after their group espousing the destination is safe. This is based on the natural influence of social networks on the emotions of their members.

- **H2a: Negative affect will increase for conformers after seeing the group disagree.**

If it is natural and safer to be part of a group, then negative emotions should arise from opposing them. Dissonance occurs when an idea is divergent from the conception of one's identity or view, and thus causes feelings of discord psychologically (Festinger, 1972). This mental discord causes a negative emotional reaction. So when the group disagrees with individuals, they should feel more negatively.

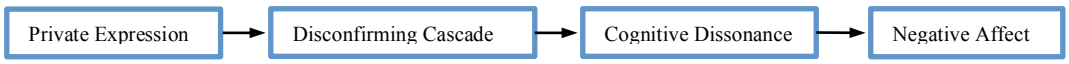

Figure 3.2 –Hypothesis 2a

- **H2b: Negative affect will decrease for conformers after agreeing with the group on their final choice.**

In response to negative affect from the dissonance between a personal opinion and a group opinion, individuals will seek to mitigate this feeling by conforming. Since

conformity seems to be a stable trait (Ferguson, 1944; Kagan & Mussen, 1956; Rosner, 1957; Strickland & Crowne, 1962); gives benefits to group members (Rossenblatt, 1989**,** Greenberg, Solomon, & Pyszczynski, 1997, Jost & van der Toorn, 2012); and offers intrinsic rewards in the absence of net incentives (Corriveau et al., 2009; Klucharev et al., 2009; Campbell-Meiklejohn et al., 2010; Yu & Sun, 2013), it is hypothesized that conforming to a public cascade which opposes private expression reduces negative affect.

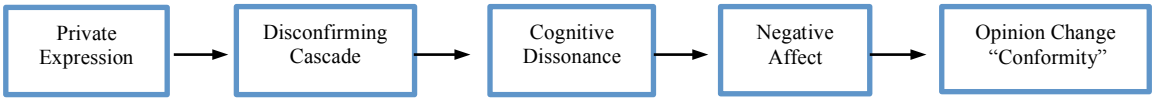

Figure 3.3 –Hypothesis 2b

- **H3a: Negative affect will decrease for non-conformers after seeing the group disagree.**

Since non-conformers need to bolster the self-concept against all social signals, they will suppress cognitive dissonance and feel more positive emotions after seeing others disagree. This level of affect will only be present as long as a final choice is not given. Temporarily seeing the conflict with the group will reinforce the perception that the individual is correct, however, permanently opposing the group will not have this effect.

- **H3b: Negative affect will increase for non-conformers after opposing the group on their final choice.**

If conformity were a natural trait without tangible incentives, which offers rewards to those in the group and causes emotional distress to those who deviate,

then opposing the group and reinforcing a personal opinion would lead to higher negative affect.

Figure 3.4 –Hypothesis 3b

- **Hypothesis 4a: If emotional reactions to the group determine whether individuals conform to the group choice, initial and final emotion levels for conformers should remain equal.**
- **Hypothesis 4b: If emotional reactions to the group determine whether individuals deviate from the group choice, initial and final emotion levels for non-conformers should remain equal.**

If the above hypotheses hold true, individual emotional reactions will be the determining factor of availability cascades. This means the initial and final opinions will be equal. Individuals will have a personal perception, but it will only be after seeing a group disagree that they will have a change in affect. The emotional goal will be to return to the same level of affect an individual experienced during his or her initial opinion. Therefore, both groups will resolve their emotional experiences back to the same level after their final choice. The affect during the initial and final opinions will be equal.

CHAPTER IV

PROCEDURES AND METHOD

A cascade phenomenon can be examined through either regression-based analyses, which use field data, or laboratory experiments. Studies using regression-based models have had difficulty in controlling multiple extraneous variables, and consequently have been unable to find a meaningful relationship between empirical evidence and theoretical hypotheses (Bikhchandani & Sharma, 2000). Laboratory experiments allow for better control of exposure to public and private information. For example, Anderson & Holt (1997) demonstrated within a lab setting that 70% of cases end in a cascade

Laboratory experiments however, do provide subjects with emotional variables from their environment (De Gelder, 2006, 2009; Neuliep, 2009; Mehrabian & Wiener, 1967). For example, facial features, body language and tonality may all influence subjects' responses in addition to diffuse status characteristics (e.g. a nice watch, an expensive suit, an individual's level of confidence). Thus, individuals' decisions will be influenced by anything that externally communicates a perception of how much they trust another's opinion (Neff, Wang, Abbott, Walker, 2010; Willis, J., & Todorov, A. 2006). Thus, for the thesis, an online survey was used so subjects were placed in an environment without an "experimental" climate. The intent was to identify the extent to which emotions produced conformity without the contaminating influence of an in-person affective reaction.

Willinger and Ziegelmeyer (1998) extended the influence of the cascade phenomenon and subsequent research included the cost of information, collective decisions, and net incentives (Celen & Kariv, 2004, 2005; Cipriani & Guarino, 2005b;

Drehmann, Oechssler, & Roider, 2005). In this thesis, net incentives—monetary or tangible rewards—were assumed to produce conformity in cascades (Huck & Oechssler, 2000; Hung & Plott, 2001). It was anticipated that subtracting external profit would leave intrinsic benefits for those predisposed to conforming to a cascade (Kubler & Weizsacker, 2004, 2005; Noth & Weber, 2003; Sgroi, 2003). Since conformity is conceptualized to be an intrinsic emotional incentive, there is likely to be innate benefits to agreement and costs to deviation. Subtracting other variables demonstrates the level to which the strength of conforming is intrinsic.

Subjects

$56 dollars was used to recruit 400 subjects from the United States. The participants were randomly selected through Amazon's Mechanical Turk feature. MTurk is a human intelligence marketplace that utilizes "workers" to complete Human Intelligence Tasks (HITs) in exchange for payment. A Human Intelligence Task (HIT) was posted on Mturk called "A 15 Minute Tourism Survey". The only parameters of the sample were that all subjects should be American English Speakers over 17 years old. Each subject read a brief description before being asked to participate. An acceptance link took subjects to a Qualtrics survey that included the instruments and questions. Once completed, a survey code allowed participants to receive their payment.

Experimental Procedure

Subjects were paid $.10 each to participate in an online tourism survey through Amazon Mechanical Turk. After completing demographic questions, individuals were

told they would be assigned to a peer group that most closely matched their responses. In reality, a survey platform called "Qualtrics" was programmed so 9 other fake group members and their opinions were controlled by the experimenter. Subjects were shown a vignette with various news articles about a destination (Appendix A) and asked to make a choice between A, the location is safe and B, it is unsafe. A check was used to confirm participants had read the information.

An 11-item scale measure of Negative Affect was developed (Appendix B), and given at time 1 (NA1), which was an individual's private feeling about their choice. Subjects were then told the group would make a public choice. If participants selected A privately, the computerized group sequentially and publically chose B, and vice versa. NA2 was measured after subjects saw the disconfirming choices of the group, which opposed their initial opinion. Subjects made a final choice and NA3 was measured after conforming to the group or reinforcing their initial opinion.

Instrumentation

A Qualtrics survey was developed encompassing several instruments. First, a demographic questionnaire was administered to the participants asking questions about age, race, gender, marital status and education. Its purpose was to prime identity salience. By implicitly suggesting the group shares demographic traits with the individual, it was anticipated this might lead to more identification with them. With more social bonding, there are greater costs to deviation. However, this assumption was not tested.

Negative Affect

A negative affect measure was adapted from Stets (2006). She found individuals experienced certain emotions when others did not confirm their self-perceived identity. When another person had a higher perceived status than the self, then anxiousness, fear, sadness, and shame were experienced. In interactions between the self and others who are perceived to have equal status, the emotions of anger, embarrassment, disappointment, and annoyance were felt (Stets, 2006). Finally, when another person had less status than the self, displeasure and discomfort were reported. These items were selected from a larger pool of emotions (Stets, 2006), and the dimensions of uncertainty—certainty and regret—assurance were added. Uncertainty is a precondition of cascades and conformity, while a regret—assurance dichotomy represented the retrospective dimension of choice. The scale was comprised of 11 items and is shown in Appendix B. The scales ranged from most negative, -10, to most positive measured at +10.

Cronbach alpha for NA1 in the pilot test was .93 for NA1, .95 for NA2 and .96 for NA3. This rose to .93, .96 and .97 respectively in the final study. Confirmatory Factor analysis suggested a 1-factor solution. The Eigen value for a 1-factor solution for Na1 decreased from 6.1 to .5. It was reduced for Na2 from 7.6 to .2 and for Na3 from 7.9 to .3 for the 2-factor solution. The factor loadings were not above .78 for any of the three negative affect measures. This suggests all of the 11 negative affect items measured one underlying concept.

CHAPTER V

RESULTS

Data were extracted from the Qualtrics website and transposed to Stata software. Names and demographic information were not recorded. Entries had an "Amazon worker tag", and participants' monetary reward codes were included. Emotional levels were measured after participants selected their initial choice, NA1, after seeing a disagreeing group, NA2, and finally after selecting the group choice or reinforcing their initial opinion, NA3. . An A selection meant the island was safe, while B meant the island was unsafe. "Conformity" is changing an initial opinion to agree with the group, while "Non-Conformity" is keeping an initial opinion the same for the final choice. 39 subjects chose A initially and then B for their final choice, while 67 chose B initially and then selected A. 112 subjects selected A for an initial choice and then A again, while 182 selected B, and then B again. Overall, 294 subjects did not conform, while 106 changed their judgments to the group choice. N = 400 for the study.

Table 5.1 Descriptive Statistics

	A "Safe"	B "Unsafe"	N
Conformers (Opinion Change)	39	67	106
Non-Conformers (Reinforced Opinion)	112	182	294
N	151	249	400

H1a: Negative affect will increase for A, "Safe", selectors after seeing their disagreeing social group.

In psychology, individuals are risk-averse (Kahneman, 2011) preferring to avoid dangerous circumstances. In tourism, the choice between safe and unsafe should have produced a difference between those who avoid danger. If they picked A, the island is safe, or B, the island is unsafe, did this effect the conforming outcome?

Table 5.2 below shows those who initially selected A, meaning the island was safe, felt more negative emotions after seeing the group disagree. Hypothesis 1a is supported. The mean decreased from .20 for Na1, to -.006 for Na2. This means the individual's perception of safety changed based on moving emotionally closer to the group's opposing judgments.

Table 5.2 Paired t-Test showing A selectors

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------------------------------------------------------------------------------
                  Paired t-test, private choice, A selectors
------------------------------------------------------------------------------
Variable |     Obs        Mean    Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
     na1 |     147       .205      .064        .781        .078     .333
     na2 |     147      -.006      .073        .894        -.152    .139
---------+--------------------------------------------------------------------
    diff |     147       .212      .062        .759         .088    .336
------------------------------------------------------------------------------
mean(diff) = mean(na1 - na2)                                  t =   3.3917
Ho: mean(diff) = 0                             degrees of freedom =      146

Ha: mean(diff) < 0           Ha: mean(diff) != 0           Ha: mean(diff) > 0
Pr(T < t) = 0.9996         Pr(|T| > |t|) = 0.0009          Pr(T > t) = 0.0004
------------------------------------------------------------------------------
```

H1b: Negative affect will decrease for B, "Unsafe", selectors after seeing their disagreeing social group.

For those who initially selected B, meaning the island was not safe, they felt more positive affect after seeing the group declare the island safe. The mean rose from -.12 to

.006. For both initial A and B selectors, seeing the opposing opinions changed their emotion toward the majority feeling. This means the group highly influenced an individual's opinion no matter the initial choice. **Table 5.3** shows this below.

Table 5.3 Paired t-Test showing B selectors

```
------------------------------------------------------------------------------
                  Paired t test, private choice, B selectors
------------------------------------------------------------------------------
Variable |     Obs        Mean    Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
     na1 |     247       -.124     .067         1.05       -.256    .007
     na2 |     247        .006     .065         1.03       -.123    .136
---------+--------------------------------------------------------------------
    diff |     247       -.130     .060          .951      -.250   -.011
------------------------------------------------------------------------------
  mean(diff) = mean(na1 - na2)                                     t =  -2.1583
Ho: mean(diff) = 0                              degrees of freedom =      246

Ha: mean(diff) < 0           Ha: mean(diff) != 0           Ha: mean(diff) > 0
Pr(T < t) = 0.0159         Pr(|T| > |t|) = 0.0319          Pr(T > t) = 0.9841
------------------------------------------------------------------------------
```

So while individuals had an initial emotional reaction to their first choice, they moved closer to the group emotion level after seeing their disagreeing choices. If an individual picked A or B, did this effect their final decision to conform or deviate? Table 5.4 below shows the levels of affect for the initial choice, Na1, showed no significant difference between those who conformed and those who did not. A two–sample t-test was run with equal variances showing p = .12. This means the initial risk-averse choice did not have an impact the decision to conform or deviate. **Table 5.4** shows this below.

Table 5.4 Two-Sample t-test showing Na1 by Conform

```
------------------------------------------------------------------------------
            Two-sample t test with equal variances, Na1 by conform
------------------------------------------------------------------------------
   Group |     Obs        Mean    Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
       0 |     291        .033      .057        .974        -.078    .146
       1 |     106      -.092      .093        .961        -.277    .092
---------+--------------------------------------------------------------------
combined |     397    7.02e-10     .048         .971        -.095    .095
---------+--------------------------------------------------------------------
    diff |               .125      .110                    -.090    .342
------------------------------------------------------------------------------
  diff = mean(0) - mean(1)                                      t =   1.1413
  Ho: diff = 0                                     degrees of freedom =      395

     Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
  Pr(T < t) = 0.8728         Pr(|T| > |t|) = 0.2544          Pr(T > t) = 0.1272
 ------------------------------------------------------------------------------
```

Table 5.5 below shows 75% of participants choose their original opinion again, while 25% conformed to the majority regardless of their choices. This means the initial risk-averse tourism choice did not affect conformity.

Table 5.5 Conformity Ratio

Private choice	Not Conform 0	Conform 1	Total
A , safe to travel	112	39	151
	74.17	25.83	100.00
B, unsafe to travel	182	67	249
	73.09	26.91	100.00
Total	294	106	400
	73.50	26.50	100.00

H2a: Negative affect will increase for conformers after seeing the group disagree.

Hypothesis 2a was supported. For those who would eventually conform on their final choice, the emotional levels became more negative after seeing the group disagree. The mean for Na2, -.09, was lower than Na1, -.34 and p = .007 for the paired T-test

between Na1 and Na2. This indicates there is a significant relationship between participants who experienced negative emotions after seeing the group disagree, and those who conformed. **Table 5.6** shows this below.

Table 5.6 Paired t-Test showing Conformers Na1-Na2

Paired t test, Conformers

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
na1	106	-.092	.093	.961	-.277	.092
na2	106	-.342	.100	1.03	-.542	-.143
diff	106	.250	.102	1.05	.047	.453

mean(diff) = mean(na1 - na2) t = 2.4509
Ho: mean(diff) = 0 degrees of freedom = 105

Ha: mean(diff) < 0 Ha: mean(diff) != 0 Ha: mean(diff) > 0
Pr(T < t) = 0.9921 Pr(|T| > |t|) = 0.0159 **Pr(T > t) = 0.0079**

H2b: Negative affect will decrease for conformers after agreeing with the group on their final choice.

In addition, participants were given a final choice (NA3) to conform to the group opinion or deviate. Hypothesis 2 stated that conforming to an opposing group reduced negative affect. For this group, a two-sample t-test with equal variance indicates this was fully supported as **Table 5.7** below shows $p < .001$. Those who felt more negatively after seeing the group conformed. For these subjects, emotions completely predicted the significant relationship between negative affect and agreeing with group signal.

Table 5.7 Two-Sample t-Test showing Conformers and Non-Conformers

```
------------------------------------------------------------------------------
               Two-sample t test with equal variances, if conform==0
------------------------------------------------------------------------------
Group |     Obs        Mean    Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
    0 |     289        .125      .054        .933        .017      .233
    1 |     106       -.342      .100        1.03       -.542     -.143
---------+--------------------------------------------------------------------
combined |  395       1.04e-09   .049        .982       -.097      .097
---------+--------------------------------------------------------------------
diff |                 .468      .109                    .253      .683
------------------------------------------------------------------------------
diff = mean(0) - mean(1)                                      t =   4.2905
Ho: diff = 0                                     degrees of freedom =      393
Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
Pr(T < t) = 1.0000         Pr(|T| > |t|) = 0.0000          Pr(T > t) = 0.0000
------------------------------------------------------------------------------
```

Conformers Summary

Tables 5.6 and 5.7 provide a clear picture of conformers' emotional levels from their initial choice to final opinion. This group felt more negative emotions after seeing a group disagree with them, and resolved this negative affect to the same level as their initial opinion by conforming. **Figure 5.8** shows this process below.

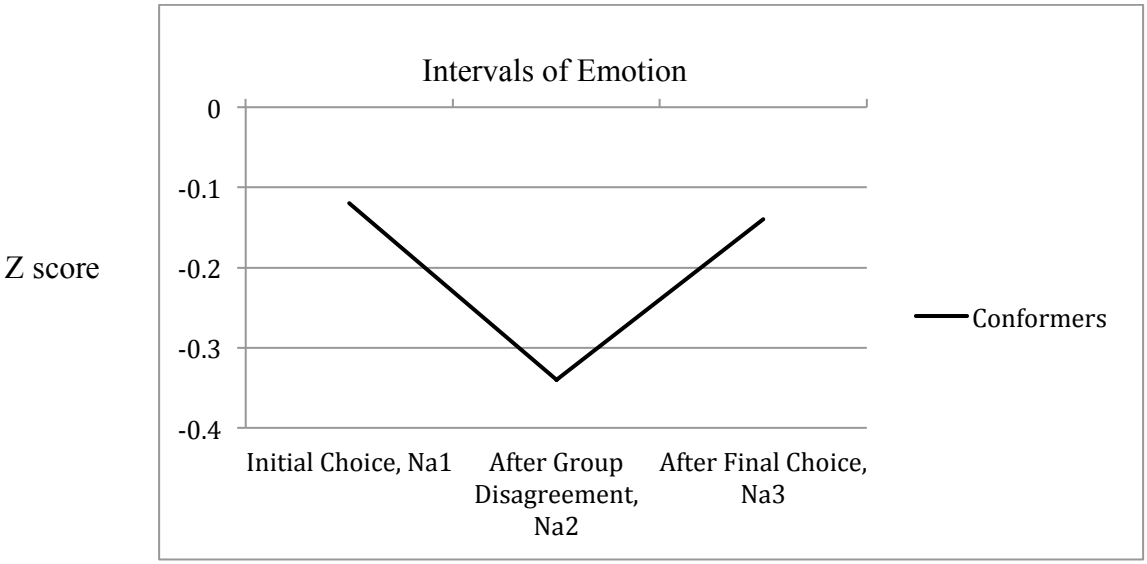

Figure 5.8 Conformers' Affect Levels

H3a: Negative affect will decrease for non-conformers after seeing the group disagree.

This is because those who re-selected their initial choice again as a final choice (A:A or B:B), felt more positively after seeing the group disagree with them. The mean rose from .03 at Na1, to .12 at Na2. **Table 5.9** below shows this significant relationship as p = .02.

Table 5.9 Paired sample t-Test showing Non-Conformers Na1-Na2

```
------------------------------------------------------------------------------
                      Paired t test, Non-conformers
                      t-test na1==na2 if conform==0
------------------------------------------------------------------------------
Variable |     Obs        Mean    Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
     na1 |    288        .032       .057        .977       -.080    .145
     na2 |    288        .128       .055        .933        .020    .236
---------+--------------------------------------------------------------------
    diff |    288       -.095       .048        .818       -.190   -.000
------------------------------------------------------------------------------
mean(diff) = mean(na1 - na2)                                    t =  -1.9876
Ho: mean(diff) = 0                           degrees of freedom =      287

Ha: mean(diff) < 0           Ha: mean(diff) != 0           Ha: mean(diff) > 0
Pr(T < t) = 0.0239         Pr(|T| > |t|) = 0.0478          Pr(T > t) = 0.9761
------------------------------------------------------------------------------
```

H3b: Negative affect will increase for non-conformers after opposing the group on their final choice.

While non-conformers felt more positively after seeing the group disagree, emotions were felt more negatively *after* this selection was made. Hypothesis 3 was supported. Those who did not conform felt more negative emotion after opposing the majority. They felt more negatively after simply re-selecting their opinion again at NA3. P = .02 for the paired t-test showing a significant relationship and the mean for NA2, .12, decreased to .05 for Na3. **Table 5.10** shows this below.

Table 5.10 Paired sample t-Test showing Non-Conformers Na2-Na3

Paired t test, Non-Conformers
t-test na2 == na3 if conform==0

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
na2	288	.123	.055	.933	.015	.231
na3	288	.056	.058	.991	-.058	.170
diff	288	.067	.030	.513	.007	.126

mean(diff) = mean(na2 - na3) t = 2.2257
Ho: mean(diff) = 0 degrees of freedom = 287

Ha: mean(diff) < 0 Ha: mean(diff) != 0 Ha: mean(diff) > 0
Pr(T < t) = 0.9866 Pr(|T| > |t|) = 0.0268 **Pr(T > t) = 0.0134**

Non-Conformers Summary

Table 5.9 and 5.10 provide a clear picture of Non-Conformers' emotional levels from initial to final opinion. This group saw conflicting judgments and felt more positively, but experienced more negative emotions after they gave their final choice. **Figure 5.11** shows this process below.

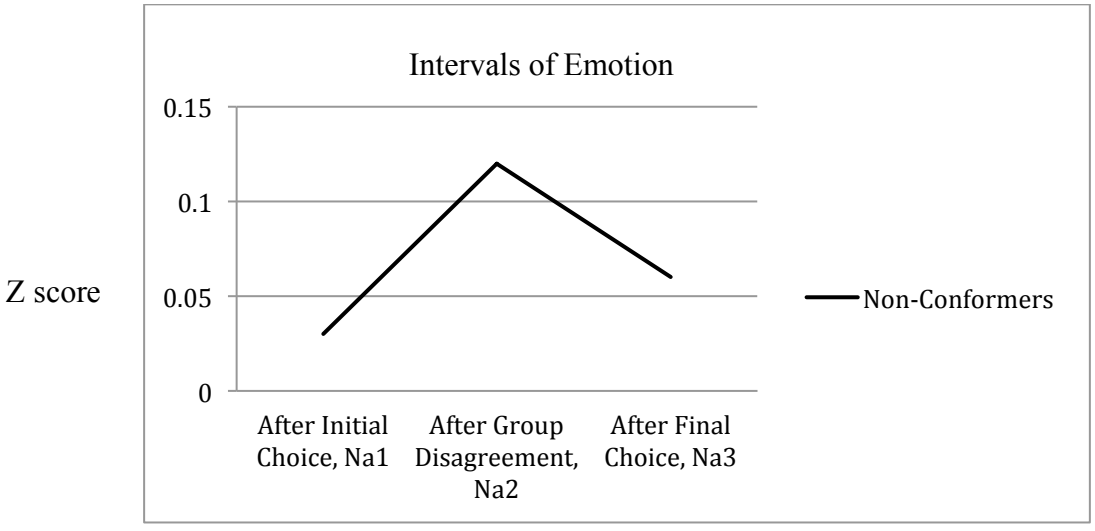

Figure 5.11 Non-Conformers' Affect Levels

Hypothesis 4a: If emotional reactions to the group determine whether individuals conform to the group choice, initial and final emotion levels for conformers should remain equal.

Hypothesis 4 was supported. Na1 measured individuals' levels of emotion after their initial choice, Na2 was measured after seeing the disagreeing group, and Na3 was a final choice to conform or deviate. Data showed that Na1 and Na3 were equal for those who conformed to group choice. The p value for the paired t-test in **Table 5.12** below was .4, meaning there was no significant difference between the mean for Na1, -.12, and for Na3, -.14. This means the group resolved to the same level of affect as they felt originally.

Table 5.12 Paired t-Test showing Conformers Na1-Na3

```
------------------------------------------------------------------------------
                             Paired t test
                        t-test na1==na3 if conform==1
------------------------------------------------------------------------------
Variable |     Obs        Mean    Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
     na1 |     104      -.122      .092        .943       -.306    .060
     na3 |     104      -.145      .094        .961       -.331    .041
---------+--------------------------------------------------------------------
    diff |     104        .022      .114       1.165       -.204    .248
------------------------------------------------------------------------------
     mean(diff) = mean(na1 - na3)                                t =   0.1950
 Ho: mean(diff) = 0                           degrees of freedom =      103

 Ha: mean(diff) < 0           Ha: mean(diff) != 0           Ha: mean(diff) > 0
 Pr(T < t) = 0.5771         Pr(|T| > |t|) = 0.8458          Pr(T > t) = 0.4229
------------------------------------------------------------------------------
```

Hypothesis 4b: If emotional reactions to the group determine whether individuals deviate from the group choice, initial and final emotion levels for non-conformers should remain equal.

Table 5.13 shows Hypothesis 4b was supported. P = .3 for the paired t-test between Na1 and Na3, meaning there was no significant difference between the mean for Na1, .03, and Na3, .06. This means the emotion in initial and final choices were equal.

Table 5.13 Paired t-Test showing Non-Conformers Na1-Na3

```
------------------------------------------------------------------------------
                         Paired t test, Non-Conformers
                         t-test na1==na3 if conform==0
------------------------------------------------------------------------------
Variable |     Obs        Mean    Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
     na1 |     290        .033       .057       .976        -.079    .146
     na3 |     290        .061       .057       .987        -.053    .175
---------+--------------------------------------------------------------------
    diff |     290      -.027        .057       .973        -.139    .085
------------------------------------------------------------------------------
     mean(diff) = mean(na1 - na3)                                t =  -0.4776
 Ho: mean(diff) = 0                         degrees of freedom =      289

 Ha: mean(diff) < 0           Ha: mean(diff) != 0           Ha: mean(diff) > 0
 Pr(T < t) = 0.3166         Pr(|T| > |t|) = 0.6333          Pr(T > t) = 0.6834
------------------------------------------------------------------------------
```

The processes for conformer and non-conformers were completely different. Yet both groups resolved back to the same level of affect they had originally. **Figure 5.14** shows the equal means for NA1 and NA3 for both groups.

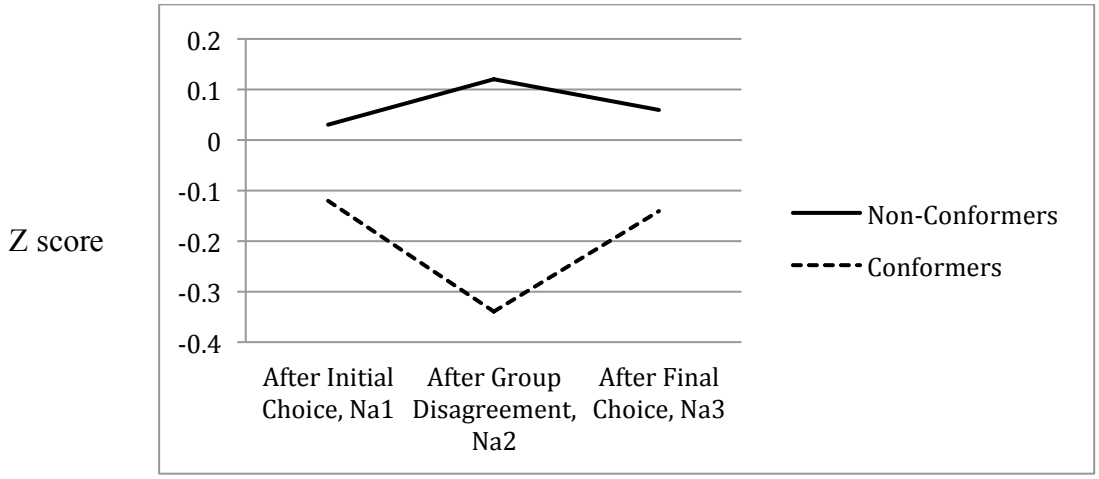

Figure 5.14 Conformers' and Non-Conformers' Affect Levels

CHAPTER VI

CONCLUSIONS

Results showed that social groups highly influence decisions. In tourism, risk-averse behavior is rational, but can lead to harmful consequences when mass perceptions incorrectly warn others of danger. At Na1, those who initially answered the island was safe experienced more positive emotions than those who answered unsafe. If individuals perceived more threat, they felt more negatively than those who perceived the destination was safe. While subjects displayed this risk-averse behavior at first, A and B selectors moved towards the emotion level of the majority after seeing these opinions.

At Na2, those who initially answered the island was safe, A, felt more negative affect when others told them it was unsafe. Those who initially answered it was unsafe, felt more positively after others told them it was safe (Tables 5.2 & 5.3).

Yet, there was no significant difference when comparing conformers and non-conformers based on their scores for Na1 (Table 5.4) nor on the percentage of conformity between an A or B choice (Tables 5.5). No matter the level of threat an individual perceived, the proportions for each group remained equal. Therefore, the risk-averse choice did not have any significance in the decision-making process. Those who selected A, it is safe, and B, it is unsafe, conformed and deviated at approximately the same rate of 25% and 75% respectively.

In summary, while the individual had an initial risk-averse judgment about the circumstances, opposite judgments shifted all subjects emotionally closer to the group. Yet, when looking at whether the initial levels of risk-averse emotion played a part in the final choice, there was no significant difference. Therefore, risk-aversion was not the

driving force for decisions, but the individual's reaction to seeing a group oppose their opinion. This demonstrated how individuals reacted to and learned from their social networks when developing their beliefs of safety and risk.

Conformers and Non-Conformers

The process for those who conformed and those who reinforced their opinion were predicted by the emotions they experienced when seeing the group disagree. As hypothesized, conformers who saw disconfirming opinions felt more negatively ($p = .007$) and then by agreeing with the majority were able to gain positive emotion ($p < .001$). Those who did not conform felt more positively after seeing the group disagree ($p = .02$), but more negatively after reinforcing their initial choice ($p = .01$). This data demonstrates it is difficult to emotionally oppose the majority for both groups, but only final outcomes were affected for conformers. This confirms findings in psychology and sociology that propose conformity exists in the absence of net incentives and is an intrinsic reward. No matter the initial choice, 25% of subjects conformed without any personal gain. This is because these individuals have a need for social approval and intrinsically feel more negative emotions when there is a lack of harmony between their personal views and the group choice.

However, 75% of participants did not experience this, deviating as a result. The need to avoid danger should have been a personal incentive to disagree with the group. Therefore, it would have been natural for those who said the island was safe, to change their opinion as they saw the social group indicate more threat. However, the rates for conformers, and those reinforcing an opinion remained stable for those who selected A or

B. With an incentive to avoid danger and no gain from opposing the group, this is also an intrinsic emotional response made in contrast to risk-aversion. Thus, both groups made their choices due to an innate emotional need. The psychology literature indicates confirmation bias should make subjects feel more positively after confirming their opinions. In this case, the experiment would have shown non-conformers feel better after the group disagreed *and* after reinforcing their initial opinion. However, data suggests the conformation bias increased positive emotions after seeing the disconfirming majority, but negative affect increased after reinforcing their choice. This is the way confirmation bias is emotionally integrated with the desire to conform. Future research should answer how to change the positive affective derived when non-conformers see contrasting opinions.

The Theory of Motivated Reasoning provides an explanation for this as it states individuals suppress cognitive dissonance through an emotional process (Kunda, 1990). When an idea or concept conflicts with a person's beliefs or identity, it will be suppressed. This suppression can come in the form of ignoring evidence or to gain the emotional benefits from the choice. For example, an individual could feel better about their choice because he or she is both suppressing negative emotion, and increasing positive emotions by reinforcing the self-concept. This explains why choices are justified at any cost based on prior beliefs. The self-concept is emotionally motivated to reach the conclusion it desires. Therefore, these affective goals determine the choices of individuals within an Availability Cascade.

Conclusion

In tourism, instances of value and risk are inferred from observing, communicating, and reacting to the public signals of social networks. As more people extrinsically support a proposition, it sometimes provides more social proof this is a reasonable conclusion. Conversely, some notions are widely supported and yet, some groups do not see this as enough validation to accept the idea. Often, perceptions on both sides can be incorrectly inferred due to the sheer number of proponents, or associations with the coalitions who support or reject these beliefs. Availability Cascades are explanations of both these phenomenon. Risk-aversion, conformity and the self-concept explain how individuals process these beliefs.

Conformity is shown to be present in the absence of personal gains, and suggests individuals obtain an intrinsic reward for following the majority. In the thesis, 25% were shown to have this disposition. As hypothesized, there are emotional incentives to yield to collective consensus and disadvantages to oppose the majority. However, 75% of participants did not conform to the group opinion. This occurred because these individuals felt significantly more positive after seeing disagreeing choices, yet felt more negatively after committing to oppose the group. Confirmation bias would have predicted the group should experience more positive emotions after both seeing group disagreement and reinforcing their opinion. Instead, the emotional desire for conformity was present in the final choice.

Whether individuals initially picked a risk-averse choice or not, they conformed and deviated at the same rate. While the threat in the choice problem did affect

judgments at first and were emotionally changed by a social group, it ultimately did not change final choices.

As no meta-emotional data was present in the online survey, there were no tangible rewards to conforming or deviating, and the risk-aversion preference remained stable over groups. Emotions were the only factor that changed opinions. In short, this indicates there are emotional incentives for conformers to conform and non-conformers to resist the majority by reinforcing their own views. These decisions were made as an individual emotionally reacted to the group, not to the information in the choice problem.

In tourism, these results imply it is possible to change a portion of the public's opinion by simply changing their social information. As more signals that disconfirm personal views are experienced, individuals will change their mind regardless of the risk involved. In contrast, the majority will reinforce a personal opinion if it is in opposition to the collective consensus. This is to gain the emotional benefits from reinforcing a positive self-view.

In the aforementioned case of the Arab Spring, Moroccan citizenship was analogous to "royal subject-hood" meaning residency in the country was synonymous with yielding to the monarchy. In contrast, a populist movement framed "new Egyptian" national identity so that an individual's participation in abolishing the government was called "patriotism". American views on climate change can also be examined in light of these results. Beliefs about human contribution are an individual's affective reaction to the social signals he or she receives. Disagreement against all opinions can be attributed to the emotional increase when seeing contrary choices. The conclusion could be drawn that individuals disagree with overwhelming consensus on the basis of education,

political affiliation or personal experience, but this thesis shows that when all affiliation is removed, this disposition is still present.

This research suggests emotion is a significant factor in determining group choices. Individuals can make decisions contrary to their own self-interest and risk factors by emotionally reacting to a social group. Further research is needed in order to change the way non-conformers react to a disconfirming majority. If this is accomplished, it is possible to introduce techniques that allow collective consensus to converge on genuine, rather than perceived, areas of risk and reward.

Future Research

Cascades are complex multi-faceted decision-making processes. The study shows *if* individuals experience negative emotions, they conform to the majority opinion. This provides a partial solution to cascades. Yet, the study also suggests non-conformers feel more positively after group disagreement. If this emotional reaction can be changed, cascades will occur consistently. The literature review suggests why individuals make these choices, but future studies can aid in examining how to change this reaction. Since non-conformers feel more pessimistic about their final choice, this indicates continued trials might compel conformity. Further research is needed to analyze how this specific decision process can result in a higher proportion of compliance.

In the study, a cascade was designed to occur. This was one method of isolating an individual's response, however, there are a number of additional possible scenarios. As a result, a significant number of variables can be manipulated for future experiments. While this experiment was done with perfect information, where individuals know all

subjects have the same information, future tasks could introduce *imperfect information*, where each participant is told news articles have been distributed randomly. This increases the uncertainty in making a choice, and conformity is hypothesized to increase.

In this order, individual were told they would choose last. In later trials, it is possible to place the individual earlier in the queue, or have others make their decisions after the subject. Deciding earlier in the order would give the subject less information on which to base an opinion, but allow an opportunity to influence those later in the chain.

It is also possible to increase the number of people who agree or disagree with the participant. By making the choice signals equal, it is hypothesized cascades would start later and the individual would have more negative affect when making a decision. In addition, participants saw all of the choices of their predecessors. Obscuring select decisions in the queue, before or after the individual's choice, would increase uncertainty.

While the experiment was performed with a single test, it is possible to expose subjects to repeated tests with the same group, either leading to group trust and cooperation or skepticism. In repeated or single trials, another set of information can also be given before making a public choice. This allows a person more literary information as well as more social information with which to make decisions.

In the experiment, identity salience was excluded except for demographic information. A meaningful extension of this research would include facets of identity, which change the way individuals ascribe trust to their social groups. For example, individuals could be paired on the basis of education, occupation, political affiliation, or a multitude of other dimensions. This would indicate whether individual trust of the group

leads individuals to ascribe more value to the collective consensus based on their evaluation of group characteristics.

Overall, this research isolated an individual's reaction to a chain of deciding members within a social group. By subtracting other variables, it suggests emotion is the defining feature by which people make decisions when a personal belief is in conflict with the majority view. For a significant proportion of people, conformity is an intrinsic and emotional incentive because it allows them to assuage the negative emotions produced by the social disharmony they experience. For others, there is an intrinsic and emotionally positive response when they see a social group contradict their views. Strengthening a belief against all social signals allows them to maintain confidence in their personal perception, however, committing to this final decision creates more negative affect. This shows it is difficult to oppose the majority. These decisions happened whether or not individuals showed an initial gravitation toward risk-averse perceptions. Therefore, if future research can facilitate a change in non-conformers reactions to their social groups, any proposition can result in collective consensus. If this is achieved, public perception can constructively move toward genuine areas of value and away from legitimate spaces of risk.

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APPENDIX A

THE TOURISM VIGNETTE

“The island is noted as a center for health and medical services in the region, and government agencies, nuclear research, banking, and tourism are important to the economy. It is also a growing high-tech center.”

“Two tourists were taken ill with Legionnaires' disease last Sunday and rushed to the hospital.”

"It has one of the world's greatest international ports. This port is a major focus of the island's economy. It is home to the corporate offices of oil companies with major offshore operations.”

“The neighboring nation officially says the war training games on the island will involve a modest number of troops — under the amount that would require foreign observers— while the UN has estimated it to be much higher than official reports claim.”

“Most people become infected with legionnaires' disease when they inhale microscopic water droplets containing legionella bacteria. This might be the spray from a shower, faucet or whirlpool, or water dispersed through the ventilation system in a large building.”

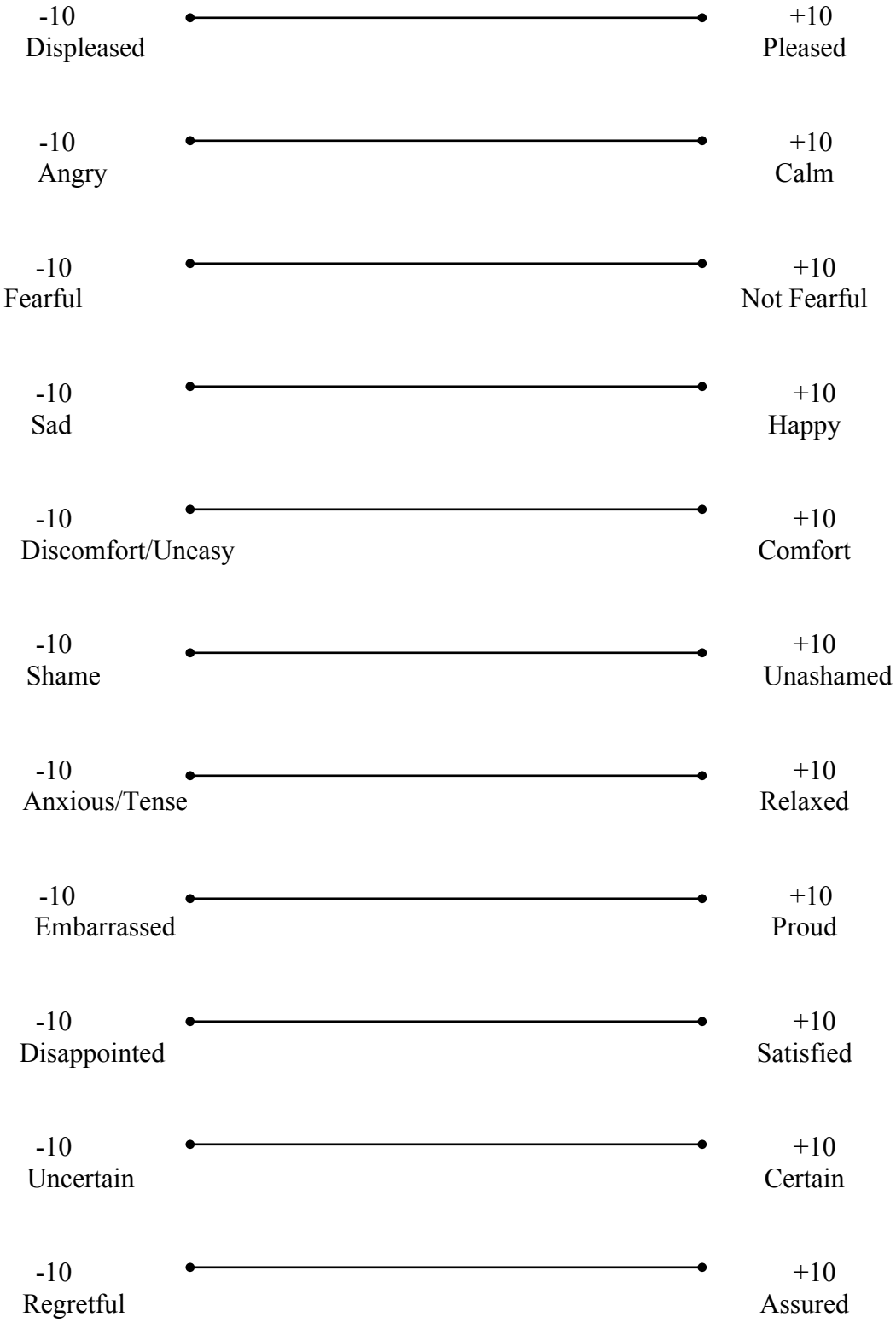
“There is also a significant tourist sector. Major attractions include the National Aquarium, Harborplace, the zoo, the Aquarium of the Pacific, whale watching tours, and water sports.”

“The second thing the UN has been worried about is that the neighboring nation might use the games to covertly keep some of its forces on the island permanently.”

Please choose one of the following options:
A. The island is safe
B. The island is unsafe

APPENDIX B

NEGATIVE AFFECT MEASURE



APPENDIX C

EIGEN VALUES

Eigen Values NA1

Factor	Eigenvalue	Difference	Proportion	Cumulative
Factor1	6.117	5.591	0.925	0.925
Factor2	0.526	0.190	0.079	1.005
Factor3	0.336	0.162	0.050	1.056
Factor4	0.173	0.144	0.026	1.082
Factor5	0.028	0.015	0.004	1.08
Factor6	0.013	0.059	0.002	1.086
Factor7	-0.046	0.044	-0.007	1.088
Factor8	-0.091	0.023	-0.013	1.067
Factor9	-0.115	0.036	-0.017	1.050
Factor10	-0.151	0.029	-0.022	1.027
Factor11	-0.180	.	-0.027	1.000

Eigen Values NA2

Factor	Eigenvalue	Difference	Proportion	Cumulative
Factor1	7.598	7.316	0.973	0.973
Factor2	0.282	0.082	0.036	1.009
Factor3	0.199	0.079	0.025	1.035
Factor4	0.120	0.069	0.015	1.051
Factor5	0.051	0.083	0.006	1.057
Factor6	-0.032	0.015	-0.004	1.053
Factor7	-0.047	0.023	-0.006	1.047
Factor8	-0.070	0.008	-0.009	1.038
Factor9	-0.078	0.022	-0.010	1.028
Factor10	-0.100	0.019	-0.012	1.015
Factor11	-0.120	.	-0.015	1.000

Eigen Values NA3

Factor	Eigenvalue	Difference	Proportion	Cumulative
Factor1	7.898	7.514	0.957	0.957
Factor2	0.383	0.176	0.046	1.004
Factor3	0.207	0.100	0.025	1.029
Factor4	0.107	0.063	0.013	1.042
Factor5	0.043	0.050	0.005	1.047
Factor6	-0.007	0.039	-0.000	1.046
Factor7	-0.046	0.013	-0.005	1.041
Factor8	-0.060	0.008	-0.007	1.033
Factor9	-0.068	0.029	-0.008	1.025
Factor10	-0.097	0.013	-0.011	1.013
Factor11	-0.111	.	-0.013	1.000

APPENDIX D

FACTOR LOADINGS

Factor loadings NA1

Variable	Factor1	Factor2	Factor3	Factor4	Factor5	Factor6
nna11	0.57	-0.15	-0.09	0.13	0.07	0.06
nna12	0.67	-0.02	0.26	0.17	0.05	-0.02
nna13	0.75	-0.29	0.19	0.04	-0.00	-0.03
nna14	0.74	0.03	0.14	-0.22	0.06	-0.03
nna15	0.84	-0.22	0.00	-0.16	-0.03	0.02
nna16	0.70	0.33	0.12	0.12	-0.02	0.02
nna17	0.83	-0.12	0.03	0.03	-0.11	0.01
nna18	0.69	0.40	0.01	-0.07	0.00	0.02
nna19	0.84	0.00	-0.11	-0.10	0.01	0.02
nna110	0.70	-0.15	-0.33	0.05	0.02	-0.02
nna111	0.77	0.22	-0.22	0.07	-0.01	-0.05

Factor loadings NA2

Variable	Factor1	Factor2	Factor3	Factor4	Factor5	Uniqueness
nna21	0.78	-0.01	-0.07	0.21	0.05	0.33
nna22	0.80	-0.14	0.15	0.12	0.08	0.28
nna23	0.79	-0.23	0.03	-0.08	0.05	0.30
nna24	0.82	0.00	0.18	0.03	-0.07	0.26
nna25	0.88	-0.17	-0.06	-0.01	-0.07	0.17
nna26	0.81	0.13	0.14	-0.12	0.08	0.27
nna27	0.87	-0.16	-0.10	-0.16	-0.02	0.17
nna28	0.76	0.25	0.13	-0.03	-0.03	0.32
nna29	0.89	0.01	-0.00	0.08	-0.11	0.17
nna210	0.83	0.09	-0.24	0.01	0.05	0.22
nna211	0.84	0.24	-0.12	-0.01	0.00	0.20

Factor loadings NA3

Variable	Factor1	Factor2	Factor3	Factor4	Factor5	Uniqueness
nna31	0.78	0.17	0.07	0.16	0.03	0.31
nna32	0.84	-0.21	0.13	0.08	0.07	0.21
nna33	0.83	-0.24	0.09	0.03	0.03	0.23
nna34	0.82	-0.07	0.21	-0.04	-0.08	0.25
nna35	0.89	-0.19	-0.16	0.01	-0.05	0.12
nna36	0.86	-0.03	-0.08	-0.15	0.10	0.20
nna37	0.87	-0.17	-0.22	-0.02	-0.03	0.15
nna38	0.79	0.20	0.10	-0.18	0.00	0.28
nna39	0.89	0.11	0.02	0.02	-0.11	0.17
nna310	0.81	0.25	-0.17	0.08	0.02	0.23
nna311	0.87	0.22	0.02	-0.00	0.01	0.17