SCHEMA ACCURACY DISTRIBUTION AMONG DEMOGRAPHIC GROUPS

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by

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DEMOGRAPHIC GROUPS

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ABSTRACT

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A *schema* is a person's dynamic cognitive structure that represents specific concepts, entities and events, sets the stage for encoding new information, and guides subsequent behavior in response to that information (Harris 1994). In the present study I suggest that schemas, while typically viewed as value neutral, might instead display various levels of accuracy and utility. To measure the level of accuracy of participants *Social Schemas* a questionnaire was developed and administered to 286 Texas State University-San Marcos (Texas State) students. Participants were asked to make predictions about average GPA scores for their colleagues and beverage sales at their campus. Higher levels of accuracy were described as expertise, and were used to argue that expert knowledge can reside within the perceived layman. The case was made that

the perceived layman possesses expertise, expert knowledge, on particular topics, especially social phenomena, and that this expertise could be used to make more accurate evaluations and predictions in the social sciences. Since an individual's schema is developed through socialization, it is susceptible to the biases and stereotypes of that socialization. Because of this bias, the study also attempted to discover if schema accuracy was higher for certain demographic groups and whether groups were better at predicting within their own group.

This research found evidence that people do have varying levels of *Schema* accuracy. The most dramatic finding showed that the more religious people claimed to be, the less accurately they predicted average GPA scores. But, overall, the study found no substantial data to suggest that any participants *Social Schema* was more or less accurate, outperforming or under performing, based on race or sex. The study also found no data to suggest that participants were better at predicting average GPA scores for their own race or sex than for others. The study also found that participants were able to outperform *self-reporting*, asking participants to report on themselves, accurately predicting the top beverage sales on campus using *group-reporting*. Both findings support the theory that the *perceived layman* possesses expertise and that this expertise can be used to make accurate evaluations and predictions about social phenomena.

CHAPTER I

INTRODUCTION

Philosophers, as a theoretical and philosophical exercise, have debated about what a person perceives and understands about the world around them. Such philosophers as Kant (1929) and Piaget (1972) used the word *schema* to define a dynamic cognitive structure, which represents specific concepts, entities and events, sets the stage for encoding new information, and guides subsequent behavior in response to that information (Harris 1994). However, these exercises were purely philosophic, and never crossed over into scientific research. The purpose of developing the concept of *schema,* for Kant and Piaget, was merely to produce a framework from which academics could discuss, more specifically, an individuals perceptions and memory. The notion that one individual's *schema* was better or worse, more accurate or less accurate, even superior or inferior to another was not considered. Later, psychologists used *schema theory* as a framework in curriculum development and educational research. However, schema was still never used to represent an objective interpretation of the world that could be more or less accurate.

This study, however, attempts to evaluate *schema* as an objective construct that can be a more or less accurate representation of the world. In order to do this, (1) *schema* is discussed and defined as a construct developed by each individual through socialization that is used to evaluate and interpret the world, make decisions, and take subsequent actions, (2) the concept of *schema accuracy,* which reflects the notion that schemas can be more or less accurate and are not simply subjective opinions, is discussed, (3) *schema accuracy* is then applied to the social sciences debate about what is expertise and who are experts. Here, the research defines expertise and how it applies to decision-making, (4) Finally, the research looks at how expertise from experts have dominated the social sciences, creating knowledge and the potential for biased social research. The case is made that expertise does not only reside amongst experts, but that laypersons may possess a level of expertise that can be isolated and used in evaluating and studying social phenomena. In this study *Social Schema* Accuracy is a subset of *Schema Accuracy* that represents the varying degree of social expertise an individual may possess. Evaluations from individuals with high levels of *Social Schema* Accuracy have the potential to limit social science bias and produce more accurate findings.

As part of this research, I delve further into the concept of schema accuracy to see if demographic characteristics are associated with the ability of laypersons to be experts on social phenomena. Since individuals are socialized differently from one another, some group's schema may or may not be a more refined and more accurate representation of the world. The implications of which may suggest why some groups are better able to avoid risk while navigating through the world. In essence, if an individual's schema is more accurate it should mean they have better information with which to make decisions. The better information should give them a greater chance at avoiding harm and risk while also promoting their own wants, desires, and beliefs.

CHAPTER II

LITERATURE REVIEW

Schema Theory

To understand how it is that laypersons, with no formal training, may possess expert knowledge about the social world, we must first understand the concept of *schema*. A *schema* is a person's dynamic cognitive structure that represents specific concepts, entities and events, sets the stage for encoding new information, and guides subsequent behavior in response to that information (Harris 1994). We must, also, begin to realize the process through which a person develops a schema and how it may be that expertise can arise without academic or specific training.

Immanuel Kant (1781) first started to develop the concept of *schema* in his work *Critique of Pure Reason*. Through two other publications, *Critique of Practical Reason* and *Critique of Judgment*, Kant discussed schemata to mean that which stood between or mediated the external world and internal mental structures. Through these works he proposed schemata as innate structures used to help us perceive the world.

Jean Piaget, the developmental psychologist, was the first to introduce the term *schema* in psychology. Piaget (1926) took the concept further, adding that a schema was also the structured cluster of concepts used to represent objects, scenarios or sequences of events or relations. Piaget was interested in a child's development and argued that intelligence was an individual's ability to approximate accurately the world as it really exists. Piaget (1953) coined three kinds of intellectual structures, behavioral schemata, symbolic schemata, and operational schemata, all of which were used to describe the different mental frameworks for how children approximate accurately what they experience. Piaget was interested in the development of these approximations, from childhood to adulthood, through processes of active exploration and experimentation. In this way, Piaget believed an individual's *schema* could be corrected and reinforced by social interactions.

Along with Piaget, Frederic Bartlett (1932) began to use the concept of schema in education research. In his paper on *Experimental and Social Psychology* (1932), Bartlett drew on the term *schema* as it was used by Henry Head, who discussed it more in line with physical perceptions. Head (1920) was interested in discovering what part of the brain is responsible for interpreting and relating sensations. To him schema defined the mechanism the body uses to interpret incoming sensations and prior experience in order to act. Basically, Head was examining spatial reasoning, how we decided to move or not move based on external physical forces, and how we measure our own position in space to accurately move, for example how a professional baseball player decides to swing at a pitch, or a golfer at a golf ball.

However, Bartlett was more interested in our interactions and actions that went beyond simple muscle motor control. He disagreed that these actions arose from complete and practiced memories, but that, instead, they were directed through an "imaginative reconstruction or construction, built out of the relation of our attitude towards a whole active mass of organized past reactions or experiences, and to a little outstanding detail which commonly appears in image or in language form (Bartlett

1932).” Bartlett believed that to act, we went through an endless and continuous string of assessments, all linked together and all built on previous experiences. To Bartlett (1932), schema was the building block of cognition, which is used in the process of understanding sensory data, recalling information from memory, organizing aims and sub-goals, allocating resources, and is how we process information.

While Bartlett developed schema far beyond any of his predecessors, *Schema Theory,* as it is formally known, was developed by Richard Anderson, the educational psychologist. Anderson was interested in how students learned to read, and applied his concepts of schema to the development of better curriculum and educational practices. Anderson believed prior knowledge was needed for understanding. In the context of reading, a reader uses prior knowledge to help make sense of the text. Here, Anderson demonstrated that reading comprehension is facilitated when readers have relevant, organized knowledge packets, he called *schemas*, which they use to interpret information (Anderson 1977). This theory of *schema* when applied to education, promotes the idea that abstract concepts are best understood after a foundation of concrete, relevant information has been established. This relevant knowledge provides a framework into which the newly formed structure can be fitted; without this relevant knowledge, the acquisition of new information is made more difficult or incomplete.

Through the works of these philosophers and psychologists, a *schema* came to represent more than a person’s factual knowledge about the world, or spatial reasoning, but also includes the meanings behind the facts and the structures that link them together. However, it must be noted that a schema is not a tangible thing, but instead a technical word used to describe how a person perceives, arranges, and stores information. In this way schemas are subjective theories derived from one's experiences which guide perception and memory; these subjective theories serve to facilitate the evaluation of experience and facilitate anticipations of the future, goal setting, planning, and goal execution, such as physical movement or actions (Harris 1994). In essence, a *schema* is the mental map a person creates that describes and explains the world around them, beyond their site, the future and past. A schema can be thought of as both the program and the data stored in the program that facilitates the understanding and navigating of the physical and social world.

Schema Accuracy

I hypothesize that a person's schema can be a better or worse representation of the world around them, being more or less accurate for varying topics and situations. This concept I will call *Schema Accuracy*. Piaget, Bartlett, and Anderson do not propose a concept of schema accuracy. However, implicit in their work is the idea that schemas vary in terms of quality and usefulness.

While this research will not go into a philosophical debate over what is real and what is only perceived to be real, the argument is that the world around us is comprised of real attributes and real consequences that we attempt to evaluate accurately to avoid harm and promote our own interests. In this context, reality is not socially constructed, but, instead, perceived by the individual through a socially constructed schema. Durkheim and Marx, along with other macro sociologists, held that the world was real and real in its consequences (Ritzer 2004), and not simply a mental construct that only existed in one's mind. Marx argued that people are socially constrained or socially stratified by their status whether they choose to recognize that status or not (Ritzer 2004).

People may be subjected to social and physical laws regardless of their recognition or interpretation of them. It cannot be true that the way in which a person is socialized to interpret physical laws or social structures is subjective if the consequences of those interpretations are not subjective. Simply believing you will not get injured if you fall down stairs does not mean you will not get injured, or believing people will not judge you based on your appearance does not mean you do not actually get judged based on how you dress.

For this research I suggest that a schema is not simply a subjective construct, but is instead a construct built by each individual to accurately interpret a real world that has real consequences. While it might be true that we each make subjective evaluations about the world, these evaluations are in fact our personal predictions, our best guesses, which can be more or less accurate.

While scientists may lack the appropriate tools to measure the validity and accuracy of each and every evaluation, lacking the tool does not inherently make the thing being measured subjective, it simply makes the measurement subjective. Just in the same way weather forecasting is highly subjective and involves a level of interpretation, it is only the prediction that can be argued to be subjective and not the weather. If we have all agreed what constitutes a thunderstorm then we can determine if one has happened or not. The weather is not a matter of subjective opinion, it either stormed or it did not. However, the prediction or forecast has varying levels of subjectivity.

Since the aim of a person's schema is to measure a not entirely subjective world, schemas must also not be entirely subjective, but are comprised of objective attributes, and thus have the potential to more or less accurately represent the world. This representation is what allows an individual to make more or less accurate predictions and evaluations. A higher level of accuracy should ultimately promote better decision making, which results in more desired outcomes, promoting that persons goals, desires, and beliefs.

Since people are reacting based on their evaluations, they choose actions that they believe will have desired outcomes. However, the outcomes of these choices are rarely certain. Since this is a probabilistic world, the choices that are made represent best guesses (Tallman and Gray 1990). Sometimes the guesses are correct and the desired results are obtained, while other times they are not. Through evaluating experiences individuals attempt to avoid or at least reduce undesired results. Accurately evaluating where a decision went wrong or went right provides information for better decision making in the future. As discussed by Tallman and Gary (1990), an important motive in decision-making is the avoidance of harm. This suggests that people try to make good, rational decisions, and that they believe, for the most part, they are doing so (Kivetz 2002).

While many decisions involve interpreting the physical world, a large part of these navigations involve understanding the social structures around us. Being able to interpret what others feel, think, and believe is a part of an individual's schema. Through verbal and nonverbal communication, each individual deems where and how his or her schemas are correct or incorrect. This is the process all individuals repeat throughout their lives, refining their schemas to better represent the physical and social world around them.

The fact that society does not obey physical laws does not mean that society is completely subjective or without any law like properties. People do not exist in a void, but are connected through shared experience and meaning (Mead 1934). Even though schemas might not be identical, they do overlap in many areas, such as common language and customs, which allows us to have shared meaning and communications. (Mead 1934). Such overlaps as language, facial expressions, likes and dislikes allow understanding among individuals. However, this communication is not always complete or perfect and can be interpreted correctly or incorrectly.

Cooley (1902) and Mead (1934) developed concepts about how individuals take different vantage points to become self-aware. Cooley discussed the concept of *looking-glass-self*, which described a person viewing himself or herself through the eyes of others. Cooley believed this process produced the interpreted judgments of others and as a result led a person to become self-aware. (Ritzer 2004). Mead similarly described the same process, calling it the *Generalized Other.*

However, what another person believes about an individual is not subjective, but objective and verifiable. If a person inaccurately evaluates what others think about him or her, they cannot form accurate interpretations of themselves. This inaccuracy can produce miscommunication in the way of inappropriate dress, mannerisms, speech, and other social norms. As both Cooley and Mead point out, through taking different vantage points, a person comes to understand the social world around him or her. These vantage points are shaped and reshaped through socialization, and can have varying degrees of accuracy.

Ultimately, the degree to which people correctly perceive their environment, both social and physical, could be said to rely entirely on the correctness or accuracy of their schema; attributes of our schema, such as attentiveness, delayed gratification, self-control, and empathy/sympathy, are all learned and are all a part of how accurately we interpret the social world. While this accuracy can vary from person to person, and can depend on the particular topic or item being observed, the accuracy of the perception is not merely subjective. Individuals throughout their lives refined their schema in an attempt to better represent the reality they believe exist as a way of reducing risk, avoiding harm, and maximizing benefits.

Experts and Expertise

A primary argument for this research is that anyone, both expert and layperson, can possess expertise, or accurate information about the world. Since individuals act to refine their schema to better represent the world around them, expertise is not limited to only those academically trained. Since we all live within society, navigating social phenomena, we can all be said to be actively refining the part of our schemas that deals with social phenomena. For this research I will use the term *Social Schema* to define the part of a persons schema that represent social phenomena. While expertise may reside more probabilistically among academics and professionals, it is likely that social expertise resides commonly among laypersons.

It is important to distinguish the difference between an expert and expertise. Commonly, an *expert* is someone in possession of specialized knowledge that is accepted by the wider society as legitimate (Schudson 2006), such that he or she can be said to have expertise, on a given topic; for example, chemists, physicists, historians, and mechanics all possess a level of expertise in their particular field. However, *experts* are not considered to be evenly distributed throughout society, but, instead, are thought of as residing in academia or professional settings; whereas the *laypersons*, those individuals who do not possess expertise, are thought of as traditionally residing outside of the academic community and not thought to have enough expert knowledge to accurately evaluate social and physical phenomena (Maranta, Guggenheim, Gisler, Pohl 2003).

This is why the ability to accurately evaluate social and physical phenomena is often left up to experts. Through empirical research, sociologists, economists, anthropologists, chemists, biologists and other scientists analyze and evaluate the world. These experts provide expertise, recommendations, and guidance, which are thought to be scientifically sound and based on the facts (Maranta, Guggenheim, Gisler, and Pohl 2003).

The argument over expertise and where it resides goes back as far as Socrates. In the book, *Plato*, Socrates debates over what people think they want and what they actually need, or what is best for them. Like a parent taking care of his or her children, Socrates argues that the general public is not adequately skilled to handle the difficult decisions and talents needed to govern justly. Plato, in his book *The Republic,* discusses expertise as a separate topic, and argues that most people do not have the ability to acquire expertise. So, he argues, the few people who do, the talented, should lead the rest of society. Plato believes since only a few possess the skills needed to acquire expert knowledge, then only those few should be educated and trained, essentially creating the elite or ruling class. This practice ultimately divides society in two, *experts* and *laypersons*, or those who have expertise and those who do not.

In his book *The Concept of Mind,* Ryle (1949) discusses the difference between "knowing that" and "knowing how." Here, Ryle suggests that there is a difference between knowing that, such as knowing that the brakes in your car are what make the car stop, and knowing how, exactly how the brake mechanism works to stop the car. It is one thing to know that something exists or is used for a given purpose, and an entirely different thing to know how and why. Ryle (1949) suggests that it is the expert who knows how and the layperson who only knows what.

Ryle's concepts of "knowing" have been discussed and counter discussed since the publication of his book in 1949, and can be linked to the concept of expertise, as discussed in *Dimensions of Expertise* by Winch (2010). Winch demonstrates that there cannot be any true measure to classify an *expert* versus a *non-expert* layperson. Winch shows that if people demonstrate any expertise, by Ryle's standards, they inherently should be called experts. However, Winch (2010) shows that simply possessing a level of expertise in one particular area, or sub-area, should not qualify a person to own the title of expert.

The distinction between who is classified as an expert, who only possesses expertise, and who is a layperson is a difficult and highly subjective matter. This research accepts expertise and an expert as two distinct concepts, and while it may be impossible, philosophically, to define and identify definitively an *expert*, expertise is a measurable concept. For this research, expertise is simply accurate and specific knowledge covering a given topic. One does not need to be called an expert to possess expertise in a particular area. For example, I might be able to repair the brakes on my car but not be a mechanic, nor would I qualify as an expert brake mechanic. However, my knowledge regarding my brakes should give me a level of expertise regarding the brakes of my make and model of car.

Hartzler and Pratt (2011) in their paper on patient expertise versus clinician expertise, demonstrate the difference between what advice patients can offer as opposed to clinicians. They show that while patients do not possess the same level of expertise over medical procedures, patients do "offer valuable personal information that clinicians cannot necessarily provide (Hartzler and Pratt 2011)." This argument is true for any "so called" expert or professional. While the doctor may be the expert, the expertise on a given procedure or illness can co-exist in both the doctor and layperson.

Society tends to think in terms of people being experts and laymen, with experts possessing expertise and laypersons without. This is not to say that we do not take advice and recommendations from our non-expert friends, family, and colleagues. However, we would not ask them "in your expert opinion," or "can you give me some expertise." While the advice may be valuable, expert advice and layperson advice often exist on two separate not equal, planes.

Science often isolates laypersons from formal academic research or evaluation. While social scientists may like to believe they are not inherently biased towards the general public, it is the general public that is often left out of many political, social, and economic decisions. Instead, these decisions fall to the so-called experts. Turner (2001) even points out that society has the misconception that ordinary consumers are easily persuaded by mysterious forces that constrain them into thinking in racist, sexist, and classist ways.

For this research, it is important to understand that experts are not being looked for to help guide or influence decisions; instead, it is expertise, which can exist among any persons, that is being looked for. An individual can have expertise covering many topics and not be considered an expert, while a doctor, lawyer, judge, or scientist may be considered an expert without any true competency. Experts, just like laypersons, exist within society and both act to refine their schemas. That is, expertise is not exclusive to academics. While academics act to refine their schemas, so do all other individuals, including laypersons. This refinement is not an all or nothing process where experts and laypersons are easily defined and separated. Instead, a continuum exists with people possessing more or less expertise on particular topics. The particular training people receive does not inherently make them an expert on a subject, even though we generally think in these terms. Instead, one should think in terms of expertise, determined by results, by the level of accuracy an individual can produce on a topic. The mere title of expert does not give someone expert knowledge, nor does lacking some formal title prevent an individual from possessing expertise.

This is not to say that socially defined "experts" are not without a high level of expertise, or that they are commonly wrong or easily swayed by social pressures. While experts are wrong from time to time, and can be found to have conflicting opinions, it is assumed that the level and variation in both opinion and interpretation of data should be less, or more accurate, among experts when compared to laypersons. Even though experts do not always have the right answer, through their methodology, training, and experience they should obtain competence in their areas of expertise, as opposed to the average laypersons (Schudson 2006), which, as a collective group, gives them the upper hand when making forecasts, predictions, evaluations, and hypothesis.

It is not a unique idea to question the inherent ability of any one expert to correctly measure the social world or make predictions about it at a given time. Experts often show a willingness to be judged as qualified or unqualified by the expert community, their peers (Turner 2006).

In fact, science is built on the principal of testable hypothesis and theory, which can be verified by others. As in the hard sciences, social science theories only gain acceptance after multiple verifications by multiple experts. In this way, it is neither the individual researcher nor an expert alone who verifies the theory, but a group of experts.

However, unlike in the physical sciences where interpretation and predictability are more measurable and verifiable, the social sciences are subjected to a higher level of interpretation. As a result, the social sciences are more susceptible to influences by inaccurate social pressures and biases.

The argument is not an ethical one, in which social scientists are consciously propelling some oppressive incorrect dogma. Instead, it is possible that some social scientists have been guided by influences from previous research and previous findings, making established beliefs more subjective and possibly incorrect.

Ultimately, this research is attempting to demonstrate that society has isolated laypersons from social research, based on the notion that they lack expertise. However, this research suggests and attempts to show that expertise can reside anywhere and within anyone, and can be used to evaluate social phenomena. While not evenly distributed across all demographic groups, *Schema Accuracy* expertise exists among laypersons and can be tapped to accurately evaluate social phenomena.

<u>Expertise in Social Science Research</u>

The implications of *Schema Accuracy* on social science research are two fold. First, *Schema Accuracy* allows us to examine the individual as possessing or lacking expertise, and can help explain participant's beliefs and decision-making. Second, *Schema Accuracy* offers a new way to conduct research, one in which researchers look to find individuals with expertise, but are not necessarily experts.

Social science research has focused on self-reporting from laypersons to describe social phenomena. Researchers develop self-reporting surveys and/or focus groups that are used to measure the individual. Here, it is the individual who is measuring his or her self and then through these measures researchers/experts make evaluations about the social world. However, social scientists rarely ask the individual or layperson to make the assessments about society.

Hanson (2002) suggests that while researchers have improved the ability to find out what people actually have said, much less has been done to discover what people actually know. The purpose of social sciences should not simply be to discover what people say, but to discover what they inherently know and mean. Instead of using aggregated self-reports to paint pictures of social phenomena, laypersons that possess expertise can be used to evaluate social phenomena. Researchers will then have both a new and useful tool for evaluating social phenomena and what people actually know.

Many of the phenomena social scientists try to understand do not require hyper specific knowledge only found in so called experts, or academically educated individuals.

Instead, these phenomena require general knowledge about the social world, a world in which laypersons exist and navigate, and as stated before a part of our schemas we actively attempt to refine.

Symbolic Interaction suggests that we are all sociologists and exhibit empathy and shared meaning (Ritzer 2004). The fact that all individuals, not just social scientists, attempt to learn and understand the meaning behind social phenomena suggests that social expertise should exist among the general population. Given this context, all individuals in society have the potential to refine their schema to accurately reflect the social world and possess a level of expertise about social phenomena.

However, as with all experts, the accuracy of their predictions or evaluations may be highly limited to their specific area of study. It is likely that the majority of individuals will know more about their particular network of friends, family, colleagues, and associations than a network outside of their own. It would be incorrect to argue that anyone can make accurate evaluations or predictions about any social phenomena.

While groups can be inherently wise (Surosiecki 2004), there exists no evidence to support the idea that any random selection of people can be wise, or that it will yield a correct prediction or evaluation about any question. While an aggregated answer from any random selection of people to the question “how many jellybeans are in the jar” will, in fact, yield a more accurate answer than any one individual or expert (Surosiecki 2004), this is only because the particular questions falls in the domain of an average person. In this example, the majority of participants predicting the number of jellybeans in a jar have enough expertise to make an accurate prediction. Meaning the crowd is essentially made up of enough individuals with enough expertise, and is able to more accurately guess the number of jellybeans in the jar than any one expert.

To accurately measure any social phenomena, enough expertise must be aggregated. This research is not attempting to argue that previous and current research methodologies have been inaccurate or incorrect, lacking expertise. The argument is that laypersons' opinions and evaluations have been overlooked and underrepresented on the basis that they do not possess expertise.

A new methodology for future research would instead attempt to find those individuals within society that possess expertise on particular topics, and allowing this expertise to directly facilitate in evaluations. Instead of asking individuals to evaluate themselves, social science research would ask people with accurate *Social Schemas* to evaluate the group or groups.

Demographic Differences in Schema Accuracy

It is crucial to understand that our society is made up of socially constructed, unevenly stratified, demographic groups that affect individuals within them differently. Not all individuals receive the same education, training, and socialization. Some are neglected while others are coached and looked after. Ultimately, individuals receive different socialization and different access to social information. Each individual within society develops his or her own unique *schema*, being more refined or knowledgeable in some areas and less in others. This discrepancy over information can affect how accurately individuals within these different groups perceive themselves and the world. The levels of accuracy with which people perceive the world gives them the ability or lack of ability to problem solve.

This research assumes that a difference in *Schema Accuracy* exists, and that this difference produces more or less accurate predictions and evaluations about the world. Since a person is not born with a predefined schema, but through socialization, develops his or her own (Harris 1994; McVee, Dunsmore, Gavelek 2005), there is no guarantee that everyone's map or program will be equally accurate. However, this research is not attempting to measure the process of schema development nor the link between specific types of socialization and schema accuracy. Since, *Schema Accuracy* is too broad a topic, covering all components of a person's schema, to analysis in one study, the more specific concept of *Social Schema Accuracy* will be evaluated. This concept is also more pertinent to the social sciences as it deals with how well or accurately a person perceives social phenomena.

This research will look to find whether *Social Schema Accuracy* is distributed evenly or unevenly across certain demographic groups. Future research can and should look into the specifics of "why" and "how."

If a difference exists, it suggests that particular individuals or groups are developing *Social Schemas* through socialization that view the world more or less accurately, and that this difference in accuracy could give some groups or individuals a better chance at navigating through the world in such a way as to meet their own personal desires, goals, needs, and beliefs. However, demographics are not specific to race, sex, or physical appearance, but also encompass a person's socioeconomic status, education, geography and other social/environmental factors. It is entirely possible that no correlation will be found based on a person's racial status, but instead based on geography or religious status.

CHAPTER III

GAPS IN PREVIOUS RESEARCH

Previous research has looked at schema development and acquisition as it affects educational attainment and not at the distribution of schema accuracy across demographic groups. Such research as Fuchs, Fuchs, Finelli, Courey, and Hamlett (2004) have looked to demonstrate how schema theory can be used to develop better curriculums in which students acquire more vocabulary words in order to understand academic subjects.

Duncan (2005), in her study of self-schema and political information processing, used the concept of schema to try and understand political information processing and political behavior outcomes. However, her research did not assume that some schemas could be more or less accurate.

None of the educational or political research involving schema theory have looked at or assumed a difference or possible difference in schema accuracy, which may be linked to more or less accurate predictions and evaluations, such as a higher IQ or informed voters.

Other research involving schemas—Kant (1929), Bartlett (1932), Piaget (1952) Rumelhart and Ortony (1977)—only discussed schemas as a concept for the mind and attempted to argue what the concept means. These psychologists and philosophers never tested the concept of schema as it relates to or functions in the real world. The concept of schema is described and debated, but never tested.

While researchers have used schema theory to form a theoretical concept for discussing the "mind," no current research exists that attempts to gauge the accuracy of an individual's schema and the effect that this has on making real world decisions, with real world consequences. This research will attempt to analyze if such a difference exists between different demographic groups, and whether certain groups are better at evaluating within their own group compared to others.

CHAPTER IV

METHODS

Research Questions

The research questions are as follows: (1) Are there laypeople who possess expertise about social phenomena (accurate social schemas), such that they can accurately evaluate and make accurately prediction about the social world, and can these laypeople can be identified and used to guide and inform social research? Here, *Social Schema,* a subcategory of schema, was used as the concept that defined an individual's specific perceptions about social phenomena. For this study it was believed that an individual could have more or less accurate *Social Schema*; and (2) If *Social Schema* exists, does its accuracy vary among different demographic groups?

To answer these two questions, a survey was developed to capture the accuracy of a participant's *Social Schema* and their demographics. Once the survey was developed, it was administered to students at Texas State University-San Marcos (Texas State) in the spring of 2011. Texas State was chosen as the location because it allowed for the administering of the survey to large groups of participants at one time in classrooms and lecture halls. Choosing university students as participants also limited any bias based on educational background, as all the students in the study had completed high school or obtained a GED, and were enrolled in a university. Since the level of education could greatly affect the study, a group of similarly educated participants was needed. Before administering any of the surveys the study received IRB exemption through the Texas State IRB Board (exemption number EXP2010Q4884). The demographic questions were used to group participants based on different demographic categories such as: sex, race, age, academics, year first enrolled at the University, where participant was currently living, income, geographic location raised, school attended before college, religion, and parents' education. The accuracy of *Social Schemas* was measured by having participants predict future events. Since a *Social Schema* represents an individual's perceptions about social phenomena, it was believed for this study that predictions about social events would be a good measure of accuracy for participant's *Social Schemas.* Also, since these questions centered on events that had not happened yet, the answers were impossible to definitively know. Here participants were not able to rely on factual knowledge, but instead had to draw on their own experiences and beliefs in order to make social predictions.

Participants were asked to predict both average GPA scores, by sex and race, for undergraduate students in the College of Liberal Arts at Texas State for the end of the semester and the top three beverages sold on campus for the semester the survey was administered. Participant's performance on these predictive questions were used to measure the accuracy of each participants *Social Schema,* which was then compared to the different demographic categories.

Average GPA Questions

There were a total of ten categories for grade point average (GPA). Participants were asked to write their predictions next to each category: Black Men, White Men, Hispanic Men, Asian Men, American Indian Men, Black Women, White Women, Hispanic Women, Asian Women, and American Indian Women. These categories were chosen, as they were the only categories for which accurate GPA scores could be obtained from Texas State. These categories were also the only sex and race categories provided for participants to select from to describe themselves. This created *within-group* predictions and *out-of-group* predictions for analysis from the participants.

For each GPA prediction, the participant was asked to rank the level of confidence in their prediction by selection one of the three categories, which was next to the prediction: "Not Confident," "Confident," and "Very Confident." This provided a confidence score that could be used to measure the level of accuracy based on the level of confidence in one's prediction. However, this measurement was not analyzed for this study, but needs to be mentioned, as it was part of the survey.

Average GPA scores were chosen for several reasons. First, the research needed to compare predicted values to actual values from participants in order to measure the accuracy of a participant's Social *Schema*. From the Office of Institutional Research at Texas State, actual average GPA scores were collected. These scores represent actual reported scores for all students at Texas State and could be broken down by race and sex for the College of Liberal Arts.

Since the survey was measuring what people know about others and society, and since a specific group needed to be selected, the College of Liberal Arts was chosen as it had the largest selection of enrolled students, at the time of this research, allowing participants to predict on a large group within Texas State and not on an isolated less populated group.

Along with predicting average GPA scores, participants were also asked to

Self-Report their own average GPA score. This provided two measurements, *Self-Reporting* and *Group-Reporting*.

This created three ways average GPA scores for Liberal Arts students at Texas State were obtained: actual scores through the Office of Institutional Research at Texas State, Self-Reporting from Liberal Arts students, and Group-Reporting from all the participants. With these three scores a comparison between *Self-Reporting* and *Group-Reporting* could be conducted, providing another level of evaluation on expertise in social science research.

Recoding GPA Variables—each of the ten GPA predictions were recoded into variables that represented the *PERCENT-ERROR* for each prediction. Since the true average GPA scores were obtained from the Office of Institutional Research, *PERCENT-ERROR* was calculated by taking the absolute value after subtracting the prediction from the true value and then dividing it by the true value calculated.

$$\text{ABSOLUTE-PERCENT-ERROR} = (\text{Absolute Value } (\frac{\text{Prediction} - \text{True Value}}{\text{True Value}}))$$

Originally *PERCENT-ERROR* was an absolute value. This was because accuracy did not depend on being above or below the true value, but simple how incorrect a given prediction was. A prediction could not be considered more or less accurate depending on whether it was above or below the actual value, only its total absolute value away from the true value. However, it was decided that an additional comparison could be made between groups based on non-absolute values. This allowed for comparisons that would determine if certain groups were more likely to over predict or under predict average GPA scores. This created a new *GPA Error* variable, one that was not an absolute value.

$$\text{PERCENT-ERROR} = \left(\frac{\text{Prediction} - \text{True Value}}{\text{True Value}}\right)$$

This created 16 continuous variables: 8 variables for Percent-Error: GPA-Error-Male-White, GPA-Error-Male-Black, etc. And another 8 variables for Absolute-Percent-Error: GPA-ABS-Error-Male-White, GPA-ABS-Error-Male-Black, etc. One for each demographic category

Next, the *PERCENT-ERROR* variables for each demographic prediction were added together to give each participant a *GPA-TOTAL-ERROR* score, and *ABSOLUTE-PERCENT-ERROR* variables for each demographic prediction were added together to give each participant a *GPA -ABSOLUTE- TOTAL-ERROR* score.

GPA-TOTAL-ERROR = GPA-Error-Male-White + GPA-Error-Female-White + GPA-Error-Male-Black + … + GPA-Error-Female-Asian

GPA -ABSOLUTE- TOTAL-ERROR = GPA- ABS-Error-Male-White + GPA-ABS-Error-Female-White + GPA- ABS-Error-Male-Black + … + GPA- ABS-Error-Female-Asian

These variables were the combined error for the prediction the participants made regarding average GPA scores, and were used to represent the level of accuracy when predicting GPA scores. For *GPA-Absolute-Total-Error*, values closer to zero represented overall more accurate predictions and higher numbers meant less accurate. However, for *GPA-Total-Error* a true measure of accuracy could not be obtained. This was because a participant could receive a score of zero by over predicting one group and under predicting another. For example, if a participant over predicted a groups' GPA by 2 points and then under predicted anther groups' GPA by 2, the total would be zero or (2-2) = 0.

These two variables, *GPA-TOTAL-ERROR* and *GPA-ABSOLUTE-TOTAL-ERROR,* were used to run analysis with the demographic variables, and provided a comparison between different groups' *Social Schema Accuracy*.

Next, within-group and out-of-group variables were created to compare how well participants performed when predicting about his or her own group and when predicting outside of his or her own group. Groups were organized by sex and race. This created 8 different categories: White Females, Black Females, Hispanic Female, Asian Female, White Male, Black Males, Hispanic Males, Asian Males. Native Americans could not be included in the groups because there were no Native American participants.

The new variable *IN-GROUP* was created by recoding each *GPA-ABSOLUTE-TOTAL-ERROR* by race and sex, so that each group had a score that represented the absolute error in the prediction for his or her own group's average GPA. Then, the variable *OUT-GROUP* was created by recoding each *GPA-ABSOLUTE-TOTAL-ERROR* by race and sex, so that each group had a score that represented the absolute error in the prediction out of his or her own group's average GPA. This was done by adding all the absolute prediction error except the error associated with the participants own group. Finally, the variable *Prediction* was created by subtracting *Out-Group* from *In-Group.*

Prediction = (In-Group) – (Out-Group)

This variable represented how well an individual did when predicting his or her own group compared to all the other groups. As both *In-Group* and *Out-Group* were absolute values and always positive, negative numbers for *Prediction* represented a better prediction for his or her own group, while a positive meant a better prediction for the other groups.

These three variables, *In-Group, Out-Group,* and *Prediction* were used to run analysis comparing the demographic variables sex and race by their in-group and out-of-group predictions, and also provided a comparison between these different groups' *Social Schema Accuracy*.

Top Beverages Sales

Participants were asked to predict the top three beverage sales on campus for the semester and year in which the survey was administered. A list of 17 beverages was provided for participants to choose from, an 18th was provided for "None." Students were told to use the numbers "1" next to the most sold beverage, a "2" next to the second most sold, and a "3" next to the third most sold. They then selected from the same list of 18 beverages the beverage they purchased most on campus.

Top Beverage sales were used in the survey to measure participant's accuracy at predicting actual future events. Beverage sales were chosen because accurate information regarding sales could be obtained through Auxiliary Services as Texas State, allowing participants to predict on a real future event. Beverage Sales were, also, chosen because they were believed to have little or no political, religious, or other social bias.

These questions require participants to self-report on which beverage they personally purchased the most on campus and group report on which beverages people purchased the most on campus. As with average GPA scores, for each beverage prediction the participant was asked to select one of the three confidence scores provided: “Not Confident,” “Confident,” and “Very Confident.” However, this confidence rating was not used for analysis on *Schema Accuracy* or *Group-Reporting*. This created four variables: *Beverage-Rank-1*, *Beverage-Rank-2, Beverage-Rank-3,* and *Personal-Beverage.*

From the Office of Auxiliary Services at Texas State, the top 10 most sold beverages were obtained. The list reported sales based on number of cases sold and the percent increase or decrease of sales for each of the top ten beverages from the previous year, allowing for a comparison between the beverages based on a total difference in amount sold.

Recoded Beverage Variables—*Beverage-Rank-1, 2, and 3* were recoded by dividing each beverage’s sales by 32. Since the tenth most sold beverage, *Power Aid Mountain Blast*, sold 32 cases, dividing each beverage by 32 created a normalized variable that was used to represent the level of social awareness of each participant.

Below is the report from Auxiliary Services ranking the Top 10 beverages sold on campus during the 2010 Fall Semester at Texas State.

Table 1

Top Ten Beverages Sold on Campus Fall 2010

Beverage	Cases Sold	Simplified Value
Coke	376	11.75
Sprite	207	6.47
Coke Zero	140	4.38
Fanta Orange	46	1.44

Table 1 Continued

Vitamin Water XXX	40	1.25
Monster Energy K	36	1.13
Power Aid Mountain Blast	32	1.00

Note. Data gathered from Texas State Auxiliary Services

This method was chosen because the number of cases sold represented the likelihood of seeing the beverage on campus. For example, *Coke* was sold 11.75 more times than *Power Aid Mountain Blast*, which meant that Coke appeared in someone's hand walking around campus roughly 11.75 more times than *Power Aid Mountain Blast*. A person should recognize that *Coke* is much more likely to be seen on campus than *Power Aid Mountain Blast*. However, the difference between *Coke* and *Dasani* was much less substantial, or between *Diet Coke* and *Sprite*. It is possible that a person could see Dasani more frequently based on their close friends or social network and not their lack of social awareness. For this reason, points were not awarded for accurate ordering. The points simply represented recognizing which beverages were the most sold and which were the least sold.

For these reasons, each beverage was recoded to correspond to the Simplified Value. So, if a participant predicted Coke they received 11.75 points, or Sprite 6.46875 points. A point value was given for each of the three predictions the participants made. These three predictions were then added together to create the variable *Beverage-Score-Total*. It did not matter the order in which a participant selected the beverages; no penalty was given if a participant predicted beverage sales out of order. For example, it would not matter in which order the participant selected Coke, Dasani, and Cherry Coke; or Sprite, Coke, and Fanta Orange.

This method was chosen, as mentioned above, because a specific estimate could not be determined on how much each individual should have noticed each beverage's sales but, instead, only a gross estimate for how much each should have noticed was determined. Since some of the beverages only differed by a few cases, it was believed that rewarding extra points for "predicting order" was unjustifiable and did not actually represent a person's *Schema Accuracy*.

Identifying Levels of Social Schema Accuracy: Key Informants

Another goal of the research was to try and identify people who have more accurate *Schemas*, specifically *Social Schemas*, or what could be called quantitative key informants. Two series of questions were designed to identify participants who would likely have more accurate *Social Schemas* than the general population.

These two series of questions asked both general social knowledge/expertise and specific social knowledge/expertise. Using both the general and specific social questions, a measure for *Social Schema Accuracy* was developed that was used to group participants into different levels of likely social expertise.

The general social knowledge questions represented social information people should have access to and/or know. For this study it was believed that all participants would have had adequate access to the information needed to correctly answer these questions, and so, these questions gauged general social awareness, or how well a participant paid attention to common/familiar social events.

Three categories were chosen as distinct areas in which a person would be familiar, or that the general public would have a great likelihood of knowing, and could measure general social awareness: sports, politics, and entertainment. Participants selected the correct answer from five multiple-choice selections. A final sixth response allowed participants to answer "Don't Know" for each of the general social knowledge/expertise questions. The three Social Awareness Frontloaded questions: (1) Politics: "The US recently faced one of the largest oil spills in history off its coast. Which was the oil company at fault and off which coast did this happen?"; (2) Sports: "Who won the Super Bowl last season in 2010?"; and (3) Entertainment: "JWoww, Snooki, and the Situation were all stars on what TV show?"

These questions were chosen because they represented social events that were widely discussed and available throughout different media outlets. The BP's oil spill was highly discussed throughout the news media for months, over 100 million people watched the Super Bowl in 2010, and the reality TV show Jersey Shore at the time of the survey, was one of the most popular TV shows. All of these events were discussed throughout other media outlets and did not require a person to be familiar simply with the area of interest. For example, a person who has no interest in professional football would still have a high likelihood of hearing about the winner of the Super Bowl through friends, family, or different media outlets.

The specific social knowledge/expertise questions represented information the average person would not have access to. However, they were still within the domain of the average person. That is, this information was not proprietary or secret, or completely unavailable to the average person. These questions were also biased towards Texas State such that it was believed those participants who paid more attention to social phenomena specific to Texas State would do better when answering these questions. It was assumed, for this study, that those participants without a highly accurate *Social Schema* would perform poorly when answering these questions, essentially not having enough specific social knowledge/expertise and thus could be categorized as having a less accurate *Social Schema*.

Unlike the general social knowledge/expertise questions, which had multiple-choice responses, the specific social knowledge/expertise questions were open-ended. Participants had to write in their response, this made guessing accurately less likely, which also made it a better means of isolating out those with expertise and those without. These questions were also highly objective and had only one correct answer. Below are the general social knowledge/expertise questions asked to measure more specific social awareness.

(1) Approximately how many undergraduate students are currently enrolled at Texas State?

(2) Approximately what percentage of undergraduate Students are currently female?

(3) Approximately what percentage of Texas State Students are currently in the college of Liberal Arts?

The three general social awareness questions, about politics, sports, and entertainment, were each recoded into dichotomous variables; 1 being a correct response and 0 being an incorrect response. These three variables were then added together making the new variable *Trivia-Total-Correct,* which had a value range between 0 and 4; the higher the score the more accurate the level of social awareness. It is important to note that a score of four was possible out of the three questions since one of the questions had two parts. Next, *Trivia-Total-Correct* was recoded into the dichotomous variable *Trivia-*

Experts by making those who scored a four equal to one and those with less than four equal to zero.

In essence, *Trivia-Experts* were those participants who answered correctly on all of the general social knowledge/expertise questions. Since the trivia questions were very general in nature, it was believed, for this study, that the mode for participants would be 4, or answering all trivia questions correctly. Answering incorrectly was believed to show a sign of inherent disinterest or lack of social awareness.

Next, a similar process was done with the specific questions regarding Texas State: *Enrollment, Percent Female,* and *Percent Liberal Arts*.

Enrollment was the only question with a response that was not in a percent. To turn it into a percent, *Enrollment* was recoded into *Enrollment-Percent* by taking the absolute value after subtracting the true value from the predicted value and divide by the true value:

$$\text{Correct-Enrollment-Percent} = \text{Absolute Value } \left(\frac{\text{True Value} - \text{Enrollment}}{\text{True Value}}\right)$$

Percent-Liberal Arts and *Percent-Female* were already in percentage form so all that needed to be done, was to take the absolute value after subtracting from the true value.

Correct- Percent-Liberal-Arts = Absolute Value (True Value - Percent-Liberal-Arts)

Correct- Percent-Female = Absolute Value (True Value - Percent-Female)

Hence, *Correct-Enrollment-Percent, Correct-Percent-Female,* and *Correct-Percent-Liberal-Arts* were added together to create the continuous variable *TX-State-*

Percent-Total, which represented the level of accuracy when predicting these three front-loaded questions.

TX-State-Percent-Total = Correct-Enrollment-Percent + Correct-Percent-Female + Correct-Percent-Liberal-Arts.

Next, *TX-State-Percent-Total* was recoded based on percentile rankings, creating the new variable *TX-State-Percent-Rank,* which had nine different categories: 1 equaled the top 10^{th} percent, 2 equaled the top 20^{th} percent…9 equaled the top 90^{th} percent.

Finally, the variable *Experts* was coded by combining *TX-State-Percent-Rank* and *Trivia-Experts.* The top 50^{th} percentile of *TX-State-Percent-Rank* (which were the values 1 thru 4) was recoded into *Experts* if *Trivia-Experts* also equaled 1. The top 50^{th} percentile was chosen because it represented the top half of the participants. However, analysis was also done with the top 10, top 20, top 30, and so on.

It is important to note that each level of expertise was measured and compared against the variables measuring social schema accuracy (GPA and beverage predictions). This study did not arbitrarily pick a correct response rate to determine expertise, but, instead, created many categories with which to compare expertise.

Both the general and specific social knowledge/expertise questions were meant to capture social awareness in order to identify potential key informants. It was hypothesized that key informants/experts would likely have accurate social schemas (and thus be able to make predictions about the social world). However, the measures identifying key informants/experts and those assessing social schema accuracy were not tested for reliability or validity. Thus, this investigation of these concepts and their operationalization is exploratory.

CHAPTER V

FINDINGS

Univariate Analysis: Frequency Distributions

The survey was administered to a total of 268 Texas State Students enrolled in either undergraduate or graduate courses. The survey was administered during five different class periods and to math graduate students during their office hours. The tables below show the frequency for specific variables and demographic groups.

Table 2

Participant Response Totals by Sex and Race.

	Male		Female		Total	
Race	N	%	N	%	N	%
White	77	30.2	84	32.9	161	63.1
Black	13	5.10	7	2.70	20	7.80
Hispanic	33	12.0	27	10.6	60	23.5
Asian	3	1.20	2	0.80	5	2.00
Native Amer	0	0	0	0	0	0
TOTAL	126	49.4	120	47.0	246	96.4

Table 3

Participant Response Totals by Currently Living Location

	N	%
On Campus Dorm	17	6.3
Off Campus Dorm	3	1.1
Off Campus San Marcos	174	65.4

Table 3 Continued

Off Campus Not in SM	71	26.5

Table 4

Participant Response Totals by Academic Major

	N	%
Business Admin	9	3.4
Education	26	9.7
Fine Arts	21	7.8
Health Prof	16	6.0
Liberal Arts	86	32.1
Science	77	28.7
University College	7	1.9

Table 5

Participant Response Totals by Year Enrolled

	N	%
2010	38	14.2
2009	62	23.1
2008	74	27.6
2007	54	20.1
2006	17	6.3
2005	8	3.0
Earlier	14	5.2

Table 6

Participant Response Totals by Class During Survey Administration

	N	%
Calculus III	16	6.3
Applied Arts	22	8.2
Intro Physics	60	22.4
Probability	24	9.0
Urban Sociology	44	16.4
Drugs & Society	111	41.4

The participants were closely split by gender, with 126 being male (50%) and 120 being female (47%). The majority of participants were *White* (63%), with Hispanics being second (24%). Combined, Black participants and Asian participants only made up 10 percent of the participants, and there were no Native American participants.

White Females were the largest group by race and gender (33%), with *White Males* being second (30%) and *Hispanics Males* third (12%). However, broken down by race, there was an equal distribution between males and females. Black participants were the only semi-unequal group, with 13 male and 7 female participants. This made males 1.85 times greater than females in the Black race category. However, Black participants only comprised 8 percent of the total participants, so this discrepancy between males and females will not likely have an effect on the overall findings.

The majority of participants were either science (29%) or liberal arts (32%) majors. However, this was primarily due to the convenience sample. The two largest classes sampled were *Intro to Physics* (22%), mostly science majors, and *Drugs and Society* (41%), mostly liberal arts majors. Also, *Urban Sociology* (16%) was sampled, which was comprised of mostly liberal arts majors. For these reasons, it was not surprising an overwhelming majority of the participants were liberal arts and science majors.

The vast majority of participants lived in San Marcos (65%), the city where the university was located, but did not live in a dorm. In fact, only 7 percent of the participants lived in a dorm and only 6 percent lived on campus. The next larges group (27%) did not live in San Marcos, but commuted to classes. Based on year enrolled, the majority of the students were upper classmen (62%), with only 14 percent of the participants having enrolled the same academic year the survey was administered. Texas State only requires freshman students to live on campus in a dorm. Since most of the participants were upper classmen, it is not surprising that the vast majority did not live in a dorm. However, it was interesting to find that almost a third of the participants did not live in San Marcos.

<u>Schema Accuracy: GPA and Beverage Sales</u>

A total of 227 out of 268 self-reported his or her own GPA. This meant approximately 15% of the participants did not self-report their own GPA. However, with a Confidence Level at 95% and a margin of error at +/-5%, the study needed approximately 150 responses for this category. Thus, enough participants self-reported their own GPA's to use as a comparison for the new method of group reporting. Every category for Group-Reporting for GPA questions had sufficient responses (N ranging between 227-229). Overall, there were sufficient participant responses to compare Self-Reporting with Group-Reporting.

When broken down by race and gender Black males were the only group to not have a sufficient response rate. Out of the 13 participants only 8 self-reported their GPA, this means a Confidence Level at 95% with a margin of error at +/-5% could not be obtained. However, both Black (N = 20) and Asian (N = 5) Participants had low participation numbers, and a true comparison between Self-Reporting and Group-Reporting cannot be done. It should also be noted that there were no Native American responses so this category was also insufficient to truly compare Self-Reporting with Group-Reporting.

A total of 253 out of 268 self-reported his or her most purchased beverage on campus. This meant approximately 5% of the participants did not self-report for this question. However, with a Confidence Level at 95% and a margin of error at +/-5%, the study needed approximately 150 responses for this category. Thus, enough participants self-reported his or her most purchased beverage on campus to use as a comparison for the new method of Group-Reporting. Every category for Group-Reporting, for the beverages questions, had sufficient responses (N ranging between 241-242). Overall, there were sufficient participant responses to compare Self-Reporting with Group-Reporting. Unlike with GPA predictions, each category in beverage predictions provided sufficient numbers for comparison. However, 8 out of the 253 did not report his or her race or gender. For comparison between groups *Schema Accuracy* these 8 had to be thrown out. This did not appear to have an affect on the findings.

Group-reporting outperformed, had less error in predicting, Self-Reporting on 5 of the 8 demographic categories. There were ten categories, however, Native Americans could not be used, as there were no Native American participants. Two of the three categories where Self-Reporting out preformed Group-Reporting were for White-males (N = 73) and White Females (N = 79), the largest sample groups. The difference between Self-Reporting and Group-Reporting, for these categories, was not substantial, with the largest score difference being approximately 0.07 GPA points. Out of a 4-point scale (GPA ranges from 0 to 4), Group-Reporting over predicted the true value for White-Males average GPA score by 0.07 GPA points.

Table 7

Self-Reporting Response Totals for GPA Questions by Sex and Race.

	Male		Female		TOTAL	
Race	N	%	N	%	N	%
White	73	32.16	79	34.80	152	66.96
Black	8	3.52	6	2.64	14	6.17
Hispanic	30	13.22	27	11.89	57	25.11
Asian	2	0.88	2	0.88	4	1.76
Native American	0	0.00	0	0.00	0	0.00
TOTAL	114	50.0%	114	50.0%	227	100%

Table 8

Group-Reporting Response Totals for GPA by Sex and Race.

	Male	Female
Race	N	N
White	227	227
Black	227	227
Hispanic	228	226
Asian	228	225
Native Amer.	229	226

Table 9
Participants Response Totals for Personal Beverage Sales

	Male		Female		TOTAL	
Race	N	%	N	%	N	%
White	77	31.43	86	35.10	163	66.53
Black	10	4.08	7	2.86	17	6.94
Hispanic	31	12.65	28	11.43	59	24.08
Asian	3	1.22	3	1.22	6	2.45
Native American	0	0.00	0	0.00	0	0.00

Table 9 Continued	121	49.39%	124	50.61	227	100%
TOTAL	121	49.39%	124	50.61	227	100%

Table 10

Participants Response Totals for Top Beverage Sales

	Male		Female		TOTAL	
Race	N	%	N	%	N	%
White	85	32.82	87	33.59	172	66.41
Black	13	5.02	7	2.70	20	7.72
Hispanic	33	12.74	28	10.81	61	23.55
Asian	3	1.12	3	1.16	6	2.32
Native American	0	0.00	0	0.00	0	0.00
TOTAL	134	51.74	125	48.26	259	100%

Table 11

Comparison between Self and Group Reporting for GPA

	MALE			
	White	Error Abs	Error No Abs	N
GPA Self Report	3.11	0.34	0.34	73
GPA Group Report	3.19	0.42	0.42	227
True Value	2.77			
	Black	Error Abs	Error No Abs	N
GPA Self Report	2.92	0.44	0.44	8
GPA Group Report	2.84	0.36	0.36	227
True Value	2.48			
	Hispanic	Error Abs	Error No Abs	N
GPA Self Report	2.94	0.34	0.34	30
GPA Group Report	2.69	0.09	0.09	228

Table 11 Continued

True Value	2.6			
	Asian	Error Abs	Error No Abs	N
GPA Self Report	2.93	0.33	0.33	2
GPA Group Report	2.99	0.39	0.39	228
True Value	2.6			
	Native American	Error Abs	Error No Abs	N
GPA Self Report	-	-	-	0
GPA Group Report	2.71	0.1	0.1	229
True Value	2.81			

		FEMALE		
	White	Error Abs	Error No Abs	N
GPA Self Report	3.00	0.06	0.06	79
GPA Group Report	3.07	0.13	0.13	227
True Value	2.94			
	Black	Error Abs	Error No Abs	N
GPA Self Report	3.42	0.78	0.78	6
GPA Group Report	2.85	0.21	0.21	227
True Value	2.69			
	Hispanic	Error Abs	Error No Abs	N
GPA Self Report	3.00	0.29	0.29	27
GPA Group Report	2.84	0.15	0.15	226
True Value	2.69			
	Asian	Error Abs	Error No Abs	N
GPA Self Report	3.44	0.60	0.60	2
GPA Group Report	3.34	0.50	0.50	225
True Value	2.84			

Table 11 Continued

	Native American	Error Abs	Error No Abs	N
GPA Self Report	-	-	-	0
GPA Group Report	2.89	0.25	0.25	226
True Value	2.64			

Demographic Correlation of Schema Accuracy

Since this research consisted of two main survey questions, which addressed the central hypotheses, for analysis, *Average GPA scores* and *Beverage Sales*, the remainder of the results will be divided into these two sections; first discussing *Average GPA* predictions and then *Beverage Sales* predictions. At the end of each section the accuracy of *Group-Reporting* vs. *Self-Reporting* will be discussed.

Grade Point Average

ANOVA was used to compare *GPA-Absolute-Total-Error* and *GPA-Total-Error* to each of the ordinal demographic questions. Description of each question can be found above in the methods section. For each ANOVA a p-value < .05 (α) was considered significant.

GPA Absolute-Total-Error

For the *GPA-Absolute-Total-Error* the variables Class, Race, Race-Sex, and Religion showed significance. The tables below report these findings.

Table 12

GPA-ABSOLUTE-TOTAL-ERROR vs. Class

	N	Mean
Calculus III	13	1.26
Graduate Math	12	1.49
Intro Physics	51	1.79
Probability	24	1.48
Drugs and Society	99	1.33

Table 12 Continued

Urban Sociology	38	1.48

Sig. (p-value= 0.003)

While the ANOVA model showed significance, *Intro Physics* vs. *Drugs and Society* was the only Independent match to show significance in the *Class* variable.

		Sig.	Std. Dev.
Intro Physics	vs. *Drugs and Society*	p-value = 0.001	0.113

It is interesting to note that Intro Physics produced the highest score (1.79), meaning the least accurate, while Drugs and Society produced the second lowest score (1.33), the second most accurate. These two classes were the two largest sampled and compared students across two extremes; liberal arts vs. science majors.

Table 13

GPA -ABSOLUTE- TOTAL-ERROR vs. Race

	N	Mean
Other	8	1.6256
White	161	1.3792
Black	16	1.9656
Hispanic	55	1.5827
Asian	6	1.4288

Sig. (p-value= 0.009)

While the ANOVA model showed significance, *White* vs. *Black* was the only Independent match to show significance in the ANOVA model between the groups.

	Sig.	Std. Dev.
White vs. Black	p-value = 0.007	0.17

The model showed significance when comparing all categories within the *Race* variable. *White* participants had the least amount of error, the most accurate, when predicting average GPA scores. However, White vs. Black was the only independent variable between group categories that showed significance. The results suggest that the ANOVA model found significance not because the majority of the groups actually differed in predicting accuracy, but instead because one or a few groups weighted the model heavily. A Generalized Linear Model (GLM) was run to test the validity of the ANOVA findings.

It must also be noted that there were a total of 151 white participants and only 16 Black participants. The difference in size of white participants could have greatly weighted the findings in one direction, and also produced a bias in the Black race category.

Table 14

GPA-ABSOLUTE- TOTAL-ERROR vs. Race-Sex

	N	Mean
Other	8	1.6256
Female-White	80	1.3412
Female-Black	6	2.2519
Female-Hispanic	26	1.5055
Female-Asian	3	1.2062
Male-White	71	1.4220
Male-Black	10	1.7938
Male-Hispanic	29	1.6519
Male-Asian	3	1.6514

Sig. (p-value= 0.028)

While the ANOVA model showed significance, *Female-White* vs. *Female-Black* was the only Independent match to show significance in the ANOVA model between groups.

Female-White vs. Female-Black	p-value = 0.034; Std. Dev.0.279

The model showed significance when comparing all categories within the race-sex variable. It is interesting to note that Female-Asians had the least amount of error; Female-White was a close second, just beating Male-White, suggesting that the findings between GPA-Total-Error and sex were actually misleading. Males outperformed females, and Race did not show any significance. However, from the findings above, it is clear that Female-White and Female-Asian both outperformed males in all the Race categories, suggesting that males might have been both above and below the true average creating less swing in the GPA-Total-Error, where absolute values were not accounted. It is possible that, as specific groups, females out preformed males, but a few within their group pulled their accuracy down. It is also possible that females, as a group, did not vary above and below the true GPA average which would create a higher group error, but not necessarily more total error than the males.

However, when the groups were compared individually, Female-White vs. Female-Black was the only between-group categories that showed significance. This suggests that the ANOVA model found significance not because the majority of the groups actually differed in predicting accuracy, but instead because one or a few groups weighted the model heavily. A GLM was run to test the validity of the ANOVA findings

Table 15

GPA -ABSOLUTE- TOTAL-ERROR vs. Religion

	N	Mean
Very Religious	17	1.727
Moderately Religious	74	1.6474
Slightly Religious	59	1.4670
Not religious	86	1.2851

Sig. (p-value= 0.002)

While the ANOVA model showed significance, Moderately Religious vs. Not Religious showed independent significance in the ANOVA model between groups.

Moderately Religious vs. Not Religious	p-value= 0.003; Std. Dev. 0.104

And, Very Religious vs. Not Religious was close to showing independent significance in the ANOVA model between groups.

Very Religious vs. Not Religious	p-value= 0.057; Std. Dev.0.174

A clear negative correlation can be seen from the results above. The less religious the participants reported being, the more accurate their predictions, having less error. However, while the ANOVA model showed significance, Moderately Religious vs. Not Religious and Very Religious vs. Not Religious were the only Independent match to show significance between the groups.

GPA-Total-Error

For the *GPA-Total-Error* the variables *Sex* and *Religion* showed significance. The tables below report those findings. While *GPA-Absolute-Total-Error* was a true measure of accuracy, *GPA-Total-Error* was a measure of whether groups over or under estimating. If the group predictions were under the true value, this meant the majority of the group had under predicted. While if the group predictions were over the true value, this mean the majority of the group had over predicted. Results revealed that females were more likely to over predict GPAs compared to males. However, both groups over predicted.

Table 16

GPA-TOTAL-ERROR vs. Sex

	N	Mean
Male	118	0.7503
Female	118	1.0576
Total	236	

Sig. (p-value = 0.021)

Table 17

GPA-TOTAL-ERROR vs. Religion

	N	Mean
Very Religious	17	1.293
Moderately Religious	74	1.133
Slightly Religious	59	0.831
Not religious	86	0.680

Sig. (p-value = 0.014)

Again, RELIGION proved to be significant. In both the *GPA-Absolute-Total-Error* and *GPA-Total-Error* a significant and negative relationship was found where the more religious a person claimed to be the more likely they were to over predict GPAs. However, all groups over predicted.

Moderately Religious vs. *Not Religious*	p-value= 0.027; Std. Dev.0.16

The ANOVA findings for *GPA-Total-Error* suggest that SEX and RELIGION both play a significant role in the error associated with predicting average GPA scores.

<u>In-Group and Out-of-Group Comparison</u>

ANOVA was used to compare *Worst-Prediction* by race and sex. A p-value < .05 (α) was considered significant. The model showed significance with a p-value of .000.

Table 18

WORST-PREDICTION vs. Race-Sex

	N	Mean
White-Female	80	-0.066
Black-Female	6	-0.008
Hispanic-Female	26	-0.044
Asian- Female	3	0.119
White-Male	71	0.024
Black-Male	10	0.095
Hispanic-Male	29	-0.053
Asian-Male	3	0.101

Sig. (p-value = 0.000)

From Table 13 you can see that half of the values for the 8 different race and sex categories were negative. This meant that half of these groups predicted more accurately for his or her own group instead of out-of-group. Three of four groups for females predicted more accurately for their own group than for out-of-group. While three of four groups for males were less accurate at predicting their own group compared to out-of-groups. While the model showed significance, the differences between each group were small and did not appear to be substantial. The greatest difference, between White Females and Asian Females, was only 0.185 points. Out of a four point GPA scale, this accounted for less than a 5 percent error. Again, that was comparing the two extremes.

ANOVA was used to compare *In-Group* by race and sex. A p-value < .05 (α) was considered significant. The model showed significance with a p-value of .000.

Table 19

IN-GROUP vs. Race-Sex

	N	Mean
White-Female	80	.0815
Black-Female	6	.2245
Hispanic-Female	26	.1162
Asian- Female	3	.2324
White-Male	71	.1633
Black-Male	10	.2645
Hispanic-Male	30	.1218
Asian-Male	3	.2436

Sig. (p-value = 0.000

From the table above you can see that White Females performed more accurately, when compared to the other groups, at predicting their own groups average GPAs. While the model showed significance, the difference did not appear to be substantial. The difference between the largest error and smallest error, White Females and Black Males, was only 0.183 points. Out of a four point GPA scale, this accounted for less than a 5 percent error. ANOVA was used to compare *Out-Group* by Race and Sex. A p-value < .05 (α) was considered significant. The model showed significance with a p-value of .033.

Table 20

OUT-GROUP vs. Race-Sex

	N	Mean
White-Female	80	.1477
Black-Female	6	.2331
Hispanic-Female	26	.1605
Asian- Female	3	.1130
White-Male	71	.1396
Black-Male	10	.1695
Hispanic-Male	29	.1772
Asian-Male	3	.1426

Sig. (p-value = 0.033)

From the table above you can see that Asian Females out performed the other groups, with Black Females performing the worst. However, as with *In-Group* and *Worst-Prediction,* while the model showed significance the difference between each group did not appear to be substantial. The greatest difference, between Asian Females and Black Females, was 0.120 points. Out of a four point GPA scale, this only accounted for approximately a 3 percent error.

On all three models (*Out-Group, In-Group and Worst-Prediction)* no clear patter could be identified. While each model showed significance none presented a substantial difference between predicting ability of the groups to justify one outperforming or underperforming the others. Since, half of the group predicted better in their group while the other half did not, it is not clear whether individuals are better at assessing their own groups or other groups. However, this is an interesting finding. It seems understandable that participants would be better at predicting average GPAs for their own groups, by gender and race.

<u>Self, Group, and Expert/Key-Informant Reporting for GPA</u>

A total of 71 undergraduate Liberal Arts students *Self-Reported* their GPA scores; these scores were used to get average GPA's for each of the demographic variables. Below is a table showing the *Self-Reporting* (SELF), *Group-Reported* (GROUP), and *Expert* reported (EXPERT) GPA predictions based on error of the predictions. The *True value,* obtained from Texas State, was subtracted from the Average Predicted Value. The bold numbers represent which method produced the best results.

Table 21

Self-Reporting vs. Group Reporting

	SELF	N	GROUP	N	EXPERT	N
Male White	0.0114	13	0.4153	227	0.2992	59
Male Black	0.5033	3	0.3628	227	0.2737	59
Male Hispanic	0.4117	6	0.093	228	0.1041	59
Male Asian	-0.19	1	0.3978	228	0.3931	59
Male Native Am.	0	0	-0.099	229	-0.0622	59
Female White	0.1193	30	0.1277	227	0.119	59
Female Black	0.6933	3	0.2056	227	0.1929	59
Female Hispanic	-0.106	10	0.1542	226	0.0993	59
Female Asian	0.465	2	0.4958	225	0.4069	59
Female Native Am.	0	0	0.2484	226	0.1775	59
		TOTAL	0.2484	Total	0.1775	TOTAL
Average		68		228		59

White Females had the most participants with 30 and Asian Males the least with 1. Native Americans had no participants and *Self-Reporting* could not be done with this group leaving 8 out of the 10 categories to report on.

In this study, *Group-Reporting* (which was comprised of either Group or Experts) outperformed *Self-Reporting* on 6 of 8 categories. Native Americans could not be compared, as there were no Native American participants in this study. However, this could be viewed as a success for *Group-Reporting* considering this study would not have obtained any scores for Native Americans if *Self-Reporting* were the only method used. The *Group-Reporting* provided at least some level of prediction for this category.

Experts had the highest success rate, being more accurate on 5 out of the 8 categories, showing that perceived laypersons, non-academics, have the potential to outperform *Self-Reporting*. Results also suggest that a simple series of social awareness questions might be able to identify these key informants. However, academics were not used in this study for comparison. To truly measure any difference in *Schema Accuracy* between experts and perceived laypersons, this study needed to acquire a group of experts. While the findings show *Experts*, as they were defined for this study, performed well when compared to *Self-reporting* and *Group-Reporting*, no conclusions can been made about academic experts or professionals and those classified as experts for this study.

Since each category provided low levels of participants, it is unclear exactly how well *Group-Reporting* would compare to *Self-Reporting* when predicting average GPA scores across large samples. If the study had gathered higher levels of participants in each category, *Self-Reporting* might have out performed *Group-Reporting*.

The *Group-Reporting* scores were only directly compared to the *Self-Reporting* score. That is, one out performed the other only based on whether it produced a more accurate prediction, or lower level of error. An argument could be made that the difference in measurements were not substantial or significant. Future research, using larger numbers of participants will be needed to verify these findings.

Top Beverage Sales

Top Beverage Sales Predictions were obtained three ways: (1) actual scores through the Office of Auxiliary Services at Texas State, (2) through *Self-Reporting*, and (3) through *Group-Reporting* from participants.

ANOVA was used to compare *Beverage-Score-Total* to each of the ordinal demographic questions. For each ANOVA a p-value < .005 (α) was considered significant. The only variable to show significance was *Geography*:

Table 22

Beverage-Score-Total vs. Geography

	N	Mean
Texas	206	20.22
USA, Not Texas	26	18.83
Outside of USA	6	13.72

Sig. (p-value= 0.036)

The variable showed a positive correlation with participants who were more "local" having a more accurate prediction. These findings suggest that one's *Schema Accuracy* is higher when based on one's own environment. It was expected that participants living inside Texas would have a more accurate schema when asked about Texas State University, compared to those living outside of Texas, and that those living in the U.S.A. would be more accurate compared to those living outside of the U.S.A.

However, the two Non-Texas respondents had low participant numbers. The lower average could have been based on particular biases in this small group and not representative of participants outside of Texas, and these findings cannot be generalized.

T-Tests were used to compare *Beverage-Score-Total* to each of the 8 Race-Sex categories. White Males were the only group to show significance when compared to all other groups. White Males showed a significant difference in their mean Beverage Score ($\alpha = .033$). Their mean score was 19.1278, compared to the rest of the participants mean score of 20.3486. This meant that White-Males were slightly less accurate, having a lower score, when predicting Beverage sales.

<u>Self-Reporting vs. Group-Reporting Beverage Sales</u>

For this section 254 participants *Self-reported* their most purchased beverage on campus. 242 participants *Group-Reported* on the #1 beverage purchased, 241 participants *Group-Reported* on the #2 beverage purchased, and 242 participants *Group-Reported* on the #3 beverage purchased. Unlike with GPA predictions, each category in beverage predictions provided sufficient numbers for comparison.

The top three beverages were selected from each question. Three points were given to the 1st place, two points for the 2nd place, and one point for the 3rd place. These values were then added to give a total score. For Beverage-Rank-2, Dr. Pepper actually received 2nd place, but was not awarded any points because Dr. Pepper was not sold on campus at Texas State. There is no need to include it in the final prediction because it was known not to be sold on campus. Even though it showed an inaccuracy among the group, the methodology allows for discarding those predictions that are known to not actually exist.

For this reason, it was thrown out during ranking. Below are the top four *Group-Reported* predictions for beverages sold on campus.

Group-Reporting

Table 23

Final Results for Beverage Sales: After Adding Scores

	Group Reporting Rank	Points	Actual Rank
1st Place	Coke	6 points	Coke
2nd Place	Dasani	5 points	Dasani
3rd Place	Monster	4 points	Cherry Coke
4th Place	Sprite	2 points	Diet Coke
5th Place	-	0 points	Sprite
9th Place	-	0 points	Monster

Coke was the number one beverage sold on campus, Dasani was the number two, and Sprite was actually the number five. Monster, however, was the Ninth most sold beverage and not the third most sold. The group poorly predicted the third category. However, Auxiliary Services reported that Monster had a 710% increase in sales during the year the study was conducted. The high prediction numbers for Monster could have been due to a surge in sales and overall Monster activity on campus. It is also interesting to note that Diet Coke, the fourth rank spot, had an 8% decrease in sales. This decrease in sales might have led to an overall drop in Diet Coke activity on campus, which is why it might have been under predicted.

Self-Reporting

Table 24

Self-Reported Beverage Sales on Campus

Beverage	N
Sprite	22
Diet Sprite	0

Table 24 Continued

Dr. Pepper	12
Diet Dr. Pepper	1
Cherry Dr. Pepper	3
Pibb	3
Pibb Zero	0
Coke	22
Diet Coke	19
Cherry Coke	23
Coke Zero	11
Dasani	51
Monster	14
Volt	4
Vitamin Water XXX	7
Power Aid Mountain Blast	7
Fanta Orange	1
None	54

Table 25

Self-Reported Beverage Sales on Campus by Rank

Ranking
1st None
2nd Dasani
3rd Cherry Coke
4th Sprite and Coke
5th Monster

Based on *Self-Reporting* most people do not buy beverages on campus. About 20% percent of the participants selected "*None*" from the responses, meaning that a fifth of the study, from the self-reporting portion, provided unusable answers.

Dasani was the beverage participants self-reported to purchase the most on Texas State Campus, with 19%. Second was Cherry Coke, with 9%. Sprite and Coke tied for third place, each with 8%. Monster was ranked fifth with 5.2%.

It is interesting to note that Coke, even though actually ranked number one in beverage sales, was ranked fourth based on *Self-Reporting*. Here, *Self-Reporting* was unable to find the actual rank for any beverage, and was outperformed by *Group-Reporting.* However, these samples were not truly random and therefore cannot be generalized for the Texas State Student population. While this is true, it is interesting to note that the not-random sample used for Group-Reporting was still able to accurately predict the top two beverages sold on campus

CHAPTER VI

DISCUSSION

The major aim of this study was to measure levels of *Social Schema Accuracy* and determine if there are laypeople that possess social expertise (key informants) such that this expertise can be isolated and used in social research. *Social Schema Accuracy* can then be used to evaluate the potential of *Group-Reporting*. The concept of *Social Schema Accuracy* was used to argue that everyone develops a more or less accurate view of society. However, it was unclear whether or not this accuracy was evenly distributed among different demographic groups or if certain groups possessed higher levels of *Social Schema Accuracy*. The second major aim of this study was determining if *Social Schema Accuracy* varied among demographic groups.

This study evaluated *Social Schema Accuracy* as it related to within-group and out-of-group predicting. The findings did not suggest that any groups were more accurate when predicting their own race or gender. While the ANOVA models did show significance for the In-Group and Out-of-Group variables, the difference was not substantial. However, it is interesting that participants were not consistently better at evaluating their own groups average GPAs. It seems logical to assume participants would have more access to better information regarding their own groups GPAs. The ANOVA models for this analysis were unclear and did not show a direct pattern to explain which groups performed poorly and why. Instead, these findings suggest that it is incorrect to assume individuals will know more about their particular cohort. It may be instead, that it is those individuals with expertise or higher levels of *Social Schema Accuracy* that have better information for predicting and evaluating social phenomena.

The findings showed a clear negative correlation between religiosity and accuracy in predicting GPAs, with accuracy decreasing as religiosity increased. It is unlikely that these findings were due to insufficient participants numbers as sufficient participate numbers where present for each group in the religious variable.

Participants were, also, broken down based on the particular classroom they were in during the survey administration. There was a statistical difference between the six different classes: Calculus III, Graduate Math, Intro Physics, Probability, Drugs and Society (D&S), and Urban Sociology. It is interesting to note that Intro Physics students were the least accurate, while Drugs and Society students were the most accurate in predicting GPAs. These two classes were the two largest sampled and compared students across two extremes, liberal arts majors versus science majors. These were students who were studying the social world versus students who were studying the physical world.

Based on GPA predictions, this research found that there was potential for *Social Schema Accuracy* to vary based on different demographic characteristics. These findings supported Harris' (1994) McVee, Dunsmore, Gavelek (2005) general theme that people develop their own unique schema through socialization, and that these schemas can be different. No suggestion was made as to how this difference came about.

The demographic variable for geography showed a positive correlation with participants who were more "local" since they were more accurate at predicting beverage sales. These findings suggest that people's *Social Schema Accuracy* is higher when based on their own local geography. This supports Warburton and Martin (1999) findings and theory that local people have specific and useful knowledge about their local environment. While Warburton and Martin (1999) were using this theory to help locate natural recourses, the principle is the same.

Overall the findings did not show that there was any *Social Schema Accuracy* difference based on gender or race. While White males showed a significant advantage when compared to all other groups at predicting beverage sales, this difference did not appear to be substantial.

In this study *Group-Reporting* outperformed *Self-Reporting* for both predicting GPAs and beverage sales. This suggests that research strategies that ask respondents to report for others might reduce social desirability bias and/or sampling error and thus represent an improvement over traditional self report methodologies. These findings support Surosiecki (2004) argument, in his book "The Wisdom of Crowds," which argues for the inherent wisdom of groups.

When predicting average GPAs, *Group-Reporting* outperformed *Self-Reporting* on 6 of 8 demographic categories. Native Americans could not be compared, as there were no Native American participants in this study. However, this could be viewed as a success for *Group-Reporting* considering this study would not have obtained any scores for Native Americans if *Self-Reporting* were the only method used. The *Group-Reporting* provided, at least, some level of prediction for this category.

Respondents defined as experts (through a brief screener on basic social knowledge/awareness) had the highest success rate, being more accurate on 5 out of the 8 categories, showing that a select group of laypeople, non-academics, have the potential to out perform *Self-reporting*. While the findings show *Experts*, as they were defined for this study, performed well when compared to *Self-reporting* and *Group-Reporting*, no comparison can been made about academic experts or professionals and those classified as experts.

The findings for both GPA and beverage sales suggest a potential for *Group-Reporting* in market research and for the predicting ability of groups on social phenomena. A potential exists for *Group-Reporting* as new method for social science research. The *Group-Reporting* in this research, also, demonstrated the potential for front-loaded surveys aimed at isolating key-informants, persons with expertise on particular topics. While this research did not specifically test and evaluate different front-loading methods, it did show a subtle difference in *Social Schema Accuracy* between those who showed a higher level of expertise and those who did not.

While future testing needs to be conducted to show the full potential of *Group-Reporting* when predicting future events, this study showed *Group-Reporting* to be more accurate than *Self-Reporting*. Also, the greatest potential use for *Group-Reporting* occurs when participants would not be expected to answer truthfully about themselves, but might answer truthfully about others.

A major strength of this study was its unique approach to analyzing individuals' perceptions and evaluations, as defined by the new concepts of *Schema Accuracy* and *Social Schema Accuracy*. Using these concepts, this research developed and implemented a new type of survey with both *Self-Reporting* and *Group-Reporting* questions. While the study was not a true random sample and cannot be generalized, the study did find evidence to support that *Group-Reporting* has potential for future use.

While the concepts of *Schema Accuracy* and *Social Schema Accuracy* can be used as new ways to evaluate social phenomena, more importantly, these concepts provide researchers a new and useful tool for evaluating decision-making and behavior. Using *Schema Accuracy*, researchers can now look to determine when people may be accurately or inaccurately evaluating phenomena and thus better describe their behavior.

While this study did offer new and useful concepts and explores the operationalization of these concepts, a major weakness of the research was in the sampling. A convenience sample was obtained from Texas State and could not be generalized. The findings from this research are merely circumstantial and require interpretation. Even though this study attempted to eliminate potential bias in the predicting ability of the group by asking questions on beverage sales/not possessing bias and average GPA/possessing bias, the small participation numbers in certain groups and the nonrandom sampling meant the findings could have been biased in favor of the particular participants and not representative of Texas State students.. An additional limitation of the study is in the operationalization of the key concepts. The questions used to identify key informants/experts and those measuring social schema accuracy were new operationalizations with no checks for reliability and/or validity of the concepts. This was also the case for the later questions used to measure specific social knowledge. It is unclear whether obtaining respondents' predictions about student GPAs and campus consumer behavior reflect *Social Schema Accuracy*. This concept needs considerable theoretical and empirical development. The same is true for other concepts such as "experts". However, this research begins the exploration of this new avenue of investigation, which appears to have considerable potential in terms of theory and method.

Using the concept of *Schema Accuracy* as a guide, future researchers could study how to better isolate expertise and determine why certain individuals possess it. While it is assumed that expertise on a topic will help when making decisions about that particular topic, little is known about whether expertise resonates with a person over many topics. It may be the case that people only inherently possess expertise in very specific and isolated areas. Instead of there being individuals with more or less accurate schemas, there may just be individuals with only finely tuned and hyper specific schemas. For this research, the general belief was that some people possess more accurate schemas overall and are better at making decisions, than those who do not have accurate schemas.

Future research could study what kind of expertise actually helps in daily life. Possessing expertise in ancient Greek literature may or may not help with daily decisions. Little research has been conducted as to what specialized knowledge promotes or produces better decision makers. Using the concept of *Schema Accuracy*, researchers can now evaluate the difference between economists, schoolteachers, mechanics, chemists, medical doctors, criminals, and bus drivers as to how accurately they navigate daily life.

Market researchers and pollsters have used front-loaded questions as a way of isolating out demographic groups. However, future research could analyze different front-loaded formats and questions as a way of more accurately locating expertise. A system could be developed where experts are used to help create questions measuring expertise. Through a series of preliminary test runs, using both experts and laypersons, particular questions could be developed to isolate expertise for a given topics.

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