

MAKESHIFT INFORMATION CONSTRUCTIONS:
INFORMATION FLOW AND UNDERCOVER POLICE

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This dissertation presents the social virtual interface (SVI) model, which was born out of a need to develop a viable model of the complex interactions, information flow and information seeking behaviors among undercover officers. The SVI model was created from a combination of various philosophies and models in the literature of information seeking, communication and philosophy. The questions this research paper answers are as follows: 1. Can we make use of models and concepts familiar to or drawn from Information Science to construct a model of undercover police work that effectively represents the large number of entities and relationships? and 2. Will undercover police officers recognize this model as realistic? This study used a descriptive qualitative research method to examine the research questions. An online survey and hard copy survey were distributed to police officers who had worked in an undercover capacity. In addition groups of officers were interviewed about their opinion of the SVI model. The data gathered was analyzed and the model was validated by the results of the survey and interviews.

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CHAPTER 1

INTRODUCTION

General Background

In the daily lives of undercover police, there are massive amounts of data received from different sources. Inadequate processing of large amounts of data can have serious or deadly consequences.

The observational research that led to the creation of the makeshift information constructions and the model of information flow began following my appointment as deputy inspector to the Turkish National Police (TNP) Istanbul Narcotics Division. I began the process of transforming a “learning experience” into a systematic model for other “rookies” and, perhaps for educational purposes. The important question for rookies is how will they separate the needed information from “information pollution”? I searched for a way to put this process into a dynamic, open system structure model of how an undercover cop seeks, gathers, filters, and transforms the information. If this model is possible and realistic, then other police officers will have the opportunity to look at their environment in a more “sense-making approach” (Dervin, 1998). In addition, researchers would have a better sense of how raw data is transformed into a credible information source. This would be a more realistic model than currently available models of information seeking behavior, many of which were created to explain the process of information seeking behavior in calm circumstances such as a library. It should also be considered that there is always a tension between cross case models and the dynamic and unique bases of each case, but the effort is vital. Subsequent academic work in criminal justice and

information science suggest further development of the model might be useful to the broader information science academic community.

Statement of the Problem

What is the general problem? Information is the key to successful policing (Chen, Chung, Xu, Wang, Qin, & Chau, 2004). With the developing of the rapid information systems, law enforcement is exposed to large quantities of information. If this is the case, how does law enforcement deal with this mass of information? How do officers gather reliable information from the numerous and potentially unreliable sources? How do they gather such information and analyze it under great stress? How do they get information into some kind of order? How do they filter the information? Should it be arranged in piles of “good information” or “bad information,” and how would they even go about doing this? Should the information be ordered chronologically or integrated according to subject matter – such as person, place, thing, or case illustrated? Is it important to distinguish that some pieces of information were gathered under dangerous situations and some under routine conditions?

If there was not this mass amount of information that law enforcement officers have to deal with, they could just simply leave it unorganized and go over each and every piece of information whenever they needed something. However, this kind of browsing method is insufficient under certain circumstances: there is a huge mass of information and there is particular information that law enforcement is interested in, i.e. the information filtered from the “noise” that is in its nature. Two people may look at the same information source and see different aspects. When this is the case, filtering the useful information in some way makes it much easier to find the particular items of interest. Undercover officers have even more

unfiltered, raw data to analyze. Work in the field does not allow them immediate access to police databases, yet information gained on the street must be processed and filtered immediately. For example, undercover officers must learn to read the nonverbal clues and linguistic patterns of criminals to determine if the information they are giving is true (Wang, Chen, & Atabakhsh, 2004). It is not an exaggeration to say that slow or inaccurate analysis can lead to a failed operation and injury or death.

Discussions of the information sources used by undercover police units highlight two problems: the lack of useful sources and the accuracy of sources accessed by different methods. There simply are very few formal studies of undercover police work. Handbooks are plentiful, but organized information gathering became more common only after a construction of modern law enforcement units. The covert nature of the network makes it difficult and dangerous to study. The complexity of how to treat sources is emphasized by the laws and regulations governing information gathering activities. "Source" is the term used mostly by undercover police agents. Questionable but stimulating evidence can have an enormous impact on the outcome of criminal investigations (Fijnaut and Marx, 1995).

Most of the criminal justice applications that are in use have their roots in individual cases of the failure of previous laws and regulations, and they neglect the experience and wisdom of the law enforcement personnel in the front-line. The same is true of more academic writings. Politicians tend to make laws in reaction to the failures of laws and procedures in the current system. The Supreme Court case, *Terry v. Ohio* (1968), is a good case example of understanding the role of the "experienced police officer" standard. According to the court, the nature of police work depends on experience and the ability to comprehend more about conditions associated with criminal behavior than a normal citizen. Police are expected to have premonitions about

crimes before they happen. According to *Terry v. Ohio*, hunches, sixth sense, feelings, variable levels of trust and reliability, fear, pride, and twisting paths are major parts of undercover police work. However, most models of police work use linear, simple, in-office models and leave out these important aspects. They do not take into account such little things as experience.

Any research on the information seeking and gathering behavior of front-line law enforcement personnel should include the experience aspects of the police work that was outlined in *Terry v. Ohio*. So, the question becomes, can we construct a model that includes all the major elements of front-line law enforcement information seeking, gathering, and processing – a model that would include a realistic set of variables? If we succeed in answering these questions and successfully construct an information-flow model of police work, we can go one step further and ask detailed operational questions such as how does the level of experience affect the information flow model?

Undercover police work is a complex and extreme example of information seeking and gathering. This is an extreme case due to the nature of the profession's need for rapid and accurate information acquisition and processing. Generally information is sought under street conditions from individual human sources, which makes it dangerous and risky since there is lack of verification of the source and information received. In this extreme case, information seeking and gathering is not just your average subject or keyword search in the library catalogs or even a simple search in police databases. Information seeking in the streets cannot realistically make significant use of the methods that are developed for more conventional information seeking behaviors.

One of the main reasons for looking at an extreme case, a limited case, or a very different case is that we have to challenge all our assumptions. If we just look at an ordinary case, it is

very easy to make assumptions that may not hold for extreme cases. Once we take information seeking outside the library, outside the bookstore, or outside of the office and onto the street, it is very different and harder to define. When looking at human-to-human information seeking outside of the typical setting, we may find that the many assumptions for information seeking may not be accurate or transferable and that a single model is not valid.

To sum up:

1. Undercover police work is not simple information gathering,
2. Politicians and researchers do not model what is on the street,
3. Information gathering and processing in police work may be dangerous,
4. Information gathering and processing in police work is routinely time dependent,
5. Current information seeking and gathering assumptions may not be adequate for extreme cases.

Can there be a model that includes the major elements of undercover agent information seeking, gathering, and transforming? Can it include a realistic set of variables? After the model is constructed, is it possible to ask operational questions such as, does level of experience affect judgment? A preliminary model can be constructed by looking at previous models of information transfer and human info-seeking activities. This study will model the complex human information seeking behavior of a specific social group with special constraints of secrecy and danger. The model will enlarge our general understanding of human information seeking. It will also shed light on the benefits and problems of social networks for information gathering. This study suggests that if the social aspects of undercover information gathering can be formalized, then the ability to improve information-seeking methods of members of law enforcement agencies will be made easier. This can be achieved by shifting the police information-gathering methods from a set of regulations to socially effective information

sources. Study of undercover police information seeking and gathering techniques will reveal the following considerations:

1. Both formal and informal methods are significant, such as the information from police records, which are equally as important as the information that comes from the streets.
2. Small things matter, such as an informant's clue about an unknown suspect.
3. Expertise is more than the sum of several pieces of knowledge. Expertise comes from experience not necessarily limited to formal education.

A Social Virtual Interface Model

In response to the lack of models and research done that can take into account all the unique aspects of the information seeking and gathering behavior environment of undercover officers, I have created a social virtual interface (SVI) model to describe the many aspects of the process. The model incorporates previous models and numerous writings and ideas about information flow in both general and "fringe" situations.

The SVI model assumes real people are making real information judgments in face-to-face, human-to-human situations. Social virtual interface (SVI) is a systems model for social network situations that cannot easily be explicitly measured because of the complexity of interactions impacting user behavior, together with the very real danger involved in these situations. SVI can be used as a substructure or framework for isolating portions of complex social phenomena for addressing "why and how?" The model, and its details and components will be addressed in Chapter 2.

Research Questions

Throughout the history of police work, information gathering has been one of the most important items in the agenda. Information seeking and gathering for undercover police units

has an important place among the other activities of police organizations. Information seeking and gathering and its activities demonstrate that this process is a social networking activity with technical aspects. There have been some studies concerning this subject, but they are mostly studies for in-service training and internal development of government organizations and shed little light on the problem. The actual processes in real life situations have not been studied, and the processes involved have not been outlined.

My research questions consist of two parts:

1. Does the SVI model explain the phenomenon of undercover police officers' information seeking and gathering behavior?
2. Do the attitudes and beliefs of undercover cops validate the concepts of the SVI model ?

Purpose of the Study

This study uses a descriptive qualitative research method to examine the above research questions. These are its main purposes:

- To establish a model that more closely represents the unique and distinctive undercover aspects of police information seeking and analysis.
- To establish a relationship between the components that form the SVI model 's transformation stage -- noise, experience, credibility, and source, as well as the decision making process of undercover police officers.
- To examine the SVI model 's usability in the street case information flow.
- To suggest the SVI model for future training purposes of undercover police officers.
- To suggest that the human aspects of information seeking in police work might have application to more ordinary search tasks.

Significance of the Study

As mentioned before, there are limited studies about the information seeking and gathering behavior of undercover police officers found in the literature of information science or

criminal justice. Most of the literature on information exchange in criminal justice is procedural and technical information that tries to put the process of information seeking and gathering into a legal format that will prevent any possible lawsuits. SVI aims to initiate research where the component factors are all known but have not been studied or examined thoroughly by researchers, especially not in this context. If the model is found to be valid, then it will have a great impact on the understanding of information gathering in undercover work, as well as possibly being a model for the training of information gathering in the field.

Limitations and Delimitations to the Study

Doing research on a specific profession in the front-line, such as law enforcement personnel working undercover, requires one to admit up front that this is a controversial subject in terms of research method. One of the advantages for the current research project is that I personally worked in this profession for more than two years in Istanbul, one of the key cities in the world due to its geographical importance as a bridge between Asia and Europe. The real physical danger and the threat of revealing the identity of an undercover police officer means that direct observation is not an option for most researchers. In this profession, members are often bound in a closed group and devoted to secrecy, and it is hard to use the conventional research methods on these people.

My own “participant observer” status as a police officer was in Turkey, while the data gathered in support of the SVI model was conducted in the United States. In addition, the respondents were self-selected and were approached as a matter of convenience. Therefore, the degree of generalizability may be seen as limited.

CHAPTER 2

REVIEW OF THE RELATED LITERATURE

Introduction

Police need information in order to investigate a crime. The types of information that may be obtained during the course of both specific enquiries and routine police work vary enormously. Some pieces of information, such as a hair from an offender or a piece body fluid, have a particular nature, while other pieces have a more general nature, such as whether or not a suspect was wearing sunglasses or jeans. Information of a particular nature is usually called intelligence. Intelligence helps police to acquire a useful manageable suspect set (Dintino and Martens, 1983; Abadinsky, 2003; Willmer, 1970).

Police use active and passive information to establish a useful suspect set, and in due course, active information can guide to the establishment of a more trusted suspect set (Huotari and Wilson, 2001; Ramirez, Walther, Burgoon, & Sunnafrank, 2002; Willmer, 1970). For example, a bag of heroin seized by police with several fingerprints on it emits active information stating that a person has put the heroin in the bag with an intention to transport or hide and got caught. However in this case passive information, fingerprints, is not as helpful as active information in obtaining a suspect set who might have involved in this case. A fingerprint, a hairpiece, or body fluid, for example, around the crime scene may be either active or passive pieces information because they may or may not belong to the suspect. If police can prove that they belong to the suspect, then they help point directly to a suspect (Willmer, 1970).

The problem of measuring information has roots back more than 50 years ago. Shannon and Weaver (1949) observed that the topic of communication has problems at three different levels. These problems are technical, semantic and effectiveness problems. Shannon and

Weaver's theory has dealt with the technical problems but doesn't produce an answer for semantic and effectiveness problems. For example, it doesn't provide an answer about how to code messages to minimize "noise" which is formed during the producing, transmitting and receiving of a message (Burgin, 2003; Willmer, 1970). An example of the noise concept in law enforcement – in this case, undercover police officers – is the statements that politicians or high-level bureaucrats make to the public. As soon as a new mayor or a new police administrator comes into the administration, they start their jobs by making really big promises to the press and public. Noise – in this case, pressure – has an "avalanche domino effect" and a deep impact on front liners, such as undercover police officers; when it reaches the front line, this statement is taken as "make more arrests." When front liners perceive this noise in this sense, they will reflect this pressure to their information sources or snitches. Both parties will create a high level of tension, which is really hard to deal with since a small mistake might have horrendous consequences. In this case, handling the tension that results from having to hurry cases in order to arrest a criminal is an example of noise.

At this point it is a good idea to mention one of the early works in modeling criminal and police activity. *Crime and Information Theory* by Willmer, which Maltz refers to in a 1996 review article as an "excellent, although slightly outdated monograph on the application of information theory in criminology and criminal justice." (Maltz, 1996). McCarthy (2002) notes that Willmer:

adopts a different approach to the interactions between police and offenders. He suggests that these can be usefully conceptualized as information contests in which offenders strive to limit potentially dangerous information, such as clues to their identity, while the police endeavor to maximize their access to this information. These competing preferences indicate that both the police and offenders have a stake in knowing the practices of the other; moreover, the benefits achieved by either group come at the expense of the other.

It is important to mention Willmer for two reasons important to the SVI model: some concepts and terms used by more recent theorists appear in Willmer's work; Wilmer does refer to Shannon and Weaver; Willmer's use of information theory does not approach that part of police work examined in the SVI model. His use of information theory is to look examine "some of the problems connected with detection and prevention of crime." There is no attempt to examine communication at the level of the working undercover officer.

Maltz's (1996) review presents the areas of concern for information theory research on crime. In the 1960s the President's Commission on Law Enforcement and Administration of Justice formed a task force that realized there was no system wide model of law enforcement (p.12). Early models looked at repeat offender patterns and crime career patterns. Subsequent research looked at effects of imprisonment, recidivism, deterrence, prison population projections, stability of punishment, lifetime risk of victimization, and geographical patterns of crime. It is important to notice that none of the research reviewed examines street level interpersonal communication or the real-time analysis typical of undercover work.

The concept of entropy, which was used by Shannon and Weaver (1949) a measure of uncertainty, can be assessed as indicating degree of choice that exists in a given situation. The value of information, according to concept of entropy, is defined as the difference between the level of uncertainty before and after the information is received (Shannon and Weaver, 1949). The use of technology, including mug shots, fingerprint and DNA databases, crime records, etc. has improved the police capacity in receiving information.

Rapid development in information technologies and applications make the information seeking and gathering behavior of undercover police officers' lives easier (Hauck, Chau, & Chen, 2002). However, there is very little literature in the information science or criminal justice

fields about how to make use of this technology efficiently, due to the complex nature of this process and laws that are constraining the maximum use of technology (Abadinsky, 2003). Most of the literature on information exchange in criminal justice is procedural and technical and does not reflect the essence of what is being done on the streets. There are no influential studies on the information seeking and gathering process as it is undertaken by undercover police officers or intelligence analysts (Abadinsky, 2003). The theoretical work done by most administrators and scholars cannot fit the complexity of the real life situations encountered by undercover officers. However, there is much research on information flow and information seeking behavior. The following previous research has significance in the shaping of the components used in the SVI model.

Examination of the Models Used to Build SVI

Shannon and Weaver: Information Theory

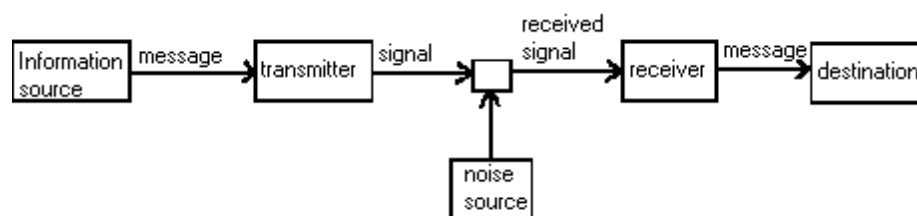


Figure 1. The Shannon-Weaver model (Shannon and Weaver, 1949).

The Shannon-Weaver model is a model of the transfer of information and is often grouped with transmission models of communication (Mick, 2003). It is a very effective model for basic information theory. Claude Shannon and Warren Weaver first presented the theory in 1949 in *Mathematical Theory of Communication*. It was designed to describe the transfer of information over telephone lines and radio waves. It presented mathematical calculations to

determine the information carrying capacity of certain channels of communication (Mick, 2003). It was not designed specifically to apply to human communication, as it does not take into account the transmission of meaning and several other important factors, yet it does explain and define basic aspects of all communication. Of course, Weaver does make the important distinction implied by Shannon that information is distinct from meaning.

The model is a linear model with six necessary elements: the source, an encoder/transmitter, a message, a channel, a decoder, and a receiver. The source can be defined as “some person or group of persons with a given purpose, a reason for engaging in communication” (Mick, 2003). The ideas from the source are put into some sort of message or code by the encoder or transmitter. Often times in human communication it is the human voice and the human that is the encoder. Many other devices may be used as the encoder. For instance when typing, the keyboard is the encoder; when talking on the phone, the phone acts as the encoder or transmitter. The message is simply what is being sent by the source. It is what is to be communicated. The channel is the medium used to send the message. For example, in speech it is the air waves - an auditory channel. In showing a picture it is a visual channel. The choice of an appropriate channel of communication is often vitally important. A decoder must be used to transfer a message to the receiver. The receiver is obviously the person or thing that ultimately gets the message being sent. It is the object of the communication. In human communication, our knowledge of language and vocabulary acts as a decoder. Also, hearing or sight may be involved, depending on the channel used to send the message. The transmitter and the receiver must also be of a similar type, or the transmission of information will fail. This can be illustrated by thinking of the transfer of information among computer programs. If the encoding program is not the same as the decoding program, no information will be

communicated. Another example would be if police found a note left by the criminal, but the police are American, and the note is written in Turkish, so without a translator, the police have the information but not the meaning.

According to the Shannon-Weaver model, noise can affect the transmission of information or the communication process (1949). This noise may take different forms. There may be actual physical noise or semantic noise. Since they were primarily concerned with the mechanical information transmission, Shannon and Weaver primarily discussed physical noise. By this they meant anything physical that disrupts the transmission of the information (1949). This is the meaning used even when discussing human communication. Physical noise that can disrupt human communication may encompass such things as an actual loud noise, something that distracts vision such as fog, a blurred image, etc. The types of physical noise possible depend on the channel of communication.

Shannon and Weaver discussed semantic noise primarily in terms of differences in the codes being used to send the message (1949). For example differing computer programs create semantic noise. When referring to human communication, semantic noise can be defined as anything that distracts from the communication of information that is not caused by physical means. For example, differences in language, attitudes towards the sender, and attitudes about the message may all cause information to not be communicated and are, therefore, types of semantic noise. Semantic noise is much more important to the study of human communication than physical noise. Physical noise in human communication can be easily accounted for; however, different types of semantic noise can have a much more varied and subtle effect.

The Shannon-Weaver model contains many parts that can be modified, expanded upon, or clarified to be used in a model of undercover information flow. For example, on the street

level cops and informants trade positions as sender, receiver, or even, hold both roles at the same time. The notion of channels and noise provide a foundation for thinking about the physical, legal, and social constraints on information. In the SVI model, noise can be defined as anything that disrupts the information process at any point.

In order to make this concept more meaningful, I will relate a personal example. We had a new unit commander responsible for the Street Patrol Unit. The first thing he did was to ask for the operation rates. There were fifteen or more patrols on the streets, with at least three police officers in each patrol. Each and every officer had to present their activity report. Some patrols had not had a successful operation for over a month, which made them look bad, but the reality was that just before the current month, they had completed good operations and had a high rate of arrests. The new unit commander demanded that all the units complete at least two operations in a week with a high rate of arrest. In the reality of the street level this was impractical. Some groups did not have to work at all to look successful, while others felt pressure to meet the demands. It was an easy time for some units and a difficult time for others. In two months, we had a new unit commander with more practical methods. Again, in this example, the noise is the pressure and the impractical demands that the unit commander put forward for us.

Possible Weaknesses of the Shannon-Weaver Model

As a linear transmission model of communication, there are many criticisms of the Shannon-Weaver model. The model is especially prone to criticisms when used to describe human communication. The model never purported to take into account the transmission of actual meaning, which is important in human communication. Obviously, when describing

human communication, the model cannot take into account the context or intentions of a message. Bowman and Targowski (1987) point out that, interpretations are also not a part of the model, and interpretations are crucial to human communication. There may also be aspects in the relationship between the sender and receiver that are crucial to understanding the communication process. The communication between mother and child, or teacher and student, is different than that of communication between peers. The channel that is used for communication may also affect the communication process and the model does not provide an adequate account of this. Because of these reasons many are inclined to call the use of this theory in human communication reductionist in nature. It only takes into account some of the actual processes. Some have gone so far as to say that when used as a model for human communication, the over simplification is dangerously misleading (Chandler, 2000).

Such criticisms generally seem to think of Shannon and Weaver in terms of a single transmission event; however, as Hayes (1993) suggests, seeing the possibility of multiple events taking place in different directions, Shannon and Weaver can account for complex human interactions.

Chatman: Small Worlds Theory

In her work Chatman has developed a theory of information behavior based on ethnographic methodologies, which were used to study the information poor. She has focused her work on such specific groups of people as female prisoners, elderly women, janitors, and even geophagists (dirt eaters). Her work has led to the concept of a "small world." Her simplest definition of small world is "a world in which everyday happenings occur with some degree of predictability" (Chatman, 2000). This predictability of the small world is, at least in part, due to the participants shared life experiences and social norms (Chatman, 1996).

Chatman began her work in information behavior by testing diffusion theory as a model for information diffusion. She studied the exchange of information among fifty women in a Comprehensive Employment and Training Act (CETA) program. She was particularly interested in the exchange of job opening information. Most importantly, she determined that information among the women was not being freely communicated (Chatman, 1986). There were many factors that kept the women from exchanging information. She also determined that if a diffusion model were to be used in communication, it would have to take into account a time factor. Information such as that about job openings can only be diffused for a certain amount of time before the information becomes useless.

After Chatman tested the diffusion theory, she used other well-defined stable populations of what were generally considered to be part of the information poor to test other theories of information behavior. Several themes that would be essential to her work and information model started to emerge. One of the most important was that of life in a small world. In doing research on university janitors, she determined that the janitors expressed information needs; however, they did not try to find information to fulfill these needs outside of their social group (Chatman, 1991). The status of an individual within a group, as well as the social norms associated with the group, affected what sort of information the members will seek. These members generally only searched for information that met their immediate needs.

As Chatman continued her research other themes emerged. When trying to apply certain models to information behavior, she found that several anomalies occurred, and these anomalies led her to develop the concepts of deception, risk-taking, secrecy, and situational relevance as a part of her work (Chatman, 1996). These factors all explained why some groups were unable to meet their information needs even though information was available. In both her studies of

janitors in the CETA program and her studies of elderly women, she found that deception was used to hide a person's condition for varying reasons. The deception can hinder a person's ability to receive needed information or to receive information at all (Chatman, 1996). Like deception, secrecy can be used to hide information. Oftentimes members of a group kept information secret if they felt that they could not trust others or the risk involved in disclosing the information was too great. Chatman found that risk-taking was needed to obtain information. Deception and secrecy were ways to protect a person if that felt that revealing the information would be too much of a risk (Chatman, 1996). Also, risk taking involves trust. Deciding whether to accept information from or divulge information to a person often depended on levels of trust. Finally, situational relevance, originally proposed by Wilson (1973), was very important to information-exchanging behavior. Chatman found that information that was most readily accepted by a group was that information that was most useful to them. Information that affected members of the group immediately was accepted faster and dispersed among other members faster.

Chatman visited a maximum-security prison for women to study how a person's social world can affect information exchange. She found that shared social norms and worldviews among those within a small world affect information flow. The shared worldview among members of a small world can include such things as language and meaning. All of this encompasses what Chatman calls a "code" for the small world. The public aspect of the small world "deems behavior - including information seeking behavior - appropriate or not" (Chatman, 1999, p.214). She also determined that it is highly unlikely that a person within a certain small world will go against these social norms to seek information. Chatman claims that the only way this might occur is if the information need is very important, or the person perceives that life in the small world is dysfunctional (1999). For information to be accepted within a small world the

information must be believable and come from a trusted source according to the views and norms within the small world. What is important information to know and obtain is also determined by the norms within the small world.

All of Chatman's research has led to a theory of normative behavior, which includes human information behavior. Her theory has four major components – social norms, world-views, social-types, and human information behavior. The social norms determine what is right or wrong within a small world. These norms may govern information seeking behavior by determining what is appropriate and inappropriate to search for. In addition to social norms, the worldview of members of a small world can define what information is important and what is not. Chatman defines the worldview as “a collective perception members of a social world hold in common regarding those things which are important” (Chatman, 2000, p.11). Social types can be defined as a classification that is given to members within a small world. For instance, certain social types may be seen as more reliable sources of information. Finally, according to Chatman, information behavior is essentially what a person does with the information they receive (2000). According to her theory, information behavior is driven by the social norms, the worldview, and the social-type within the small world. To understand how a person seeks and uses information, one must understand the small world of which the person is a member.

The small world theory gives us a lens to observe a small group of people in a system that has rules and assumptions but also has high volatility – criminals may change their minds frequently, and undercover officers may have to switch between the police way of thinking and criminal thinking.

Chatman’s study of small worlds provides a good fit for undercover police officers’ daily lives. Generally speaking, law enforcement has its own values and, so to speak, its own culture.

This holds especially for units that operate undercover. The nature of the undercover activity comes with its own arrangements, its own value systems, and its own culture. On the other side, undercover police officers' abilities to succeed depend on their ability to infiltrate another small world which is mainly on the opposite side of the law. Both sides have their own systems of arrangements and harmony. Undercover police officers have to have an ability to think, speak, act, and even live like the other side – the criminal world side. They have to know the unwritten rules of engagement between them and the criminal side. Therefore, the SVI model of information must account for work inside a particular small world, and often, two small worlds – the small world of the undercover officer and the small world of the informant or criminal. The environment the officer is in will affect the input of information and, in turn, the transformation and output. Chatman has shown that in many instances the actual input of knowledge and how one understands information is formulated by what small world a person perceives themselves to be a part of. This agrees with common knowledge of law enforcement: the undercover agent that can fit in best in the criminal world will obtain more information.

Wittgenstein's Language Games Concept

Ludwig Wittgenstein was a 20th century philosopher who was influential in the areas of linguistics, logic, and mathematical theory. In his early work, Wittgenstein tried to use mathematical logic to solve problems in linguistic theory. He believed that logic could be used to show what can and cannot be conveyed by language and that in turn could be used to explain philosophical problems. The propositions asserted in language could be determined to be true or false by propositional logic (Blair, 1990). On further analysis of his own work, Wittgenstein started to believe that analysis of language by precise logical means might not be as effective as

he had previously thought. To analyze language in the logical way he wanted would require very precise meanings of words. In addition to this, everyone using such words had to agree on and use these exact meanings. Analysis in this way is basically futile because few words have such precise definitions. In light of this problem, Wittgenstein began to develop a new language theory, which was not consistent with his previous work.

Like games, language use has rules. Different games have different rules, and so do different speech acts or different ways we use the language. This is the basic analogy Wittgenstein used when naming his theory on language and speech acts “language games.” He put forth this linguistic theory in his book *Philosophical Investigations*. Wittgenstein called all language and the activities involved in its use and understanding a “language game”; he also called each individual speech act a “language game” (Wittgenstein, 1953, p.5). Wittgenstein never explicitly defines “language game,” although he does give numerous examples of the language game and claims that there are countless more. Some of the examples he gives are as follows:

- reporting an event --
- speculating about an event--
- forming or teasing a hypothesis--
- presenting the results of an experiment in tables and diagrams--
- making up a story; and reading it --
- singing catches --
- guessing riddles (Wittgenstein, 1953, pp. 11-12)

Also, as Wittgenstein states, we can think of different types of sentences as different language games. Commands, assertions, and questions are all kinds of language games.

In language games, words are used like tools. The meanings of words may change depending on the usage or the type of language game being played. In short, language is a game, and words are part of the equipment or tools used for the game, and these tools can be used in

many different ways. Wittgenstein believes that the actual meaning of words depends for the most part on how the word is being used. Meaning is not completely dependent on things in the actual world. This means that we can speak of things that do not actually exist and make propositions about them. The meaning of the word will vary depending on the context in which it is spoken (how it is used or what language game is being played). The meaning of the word is determined by the rules of the language games; however, different games may have different rules. Also, Wittgenstein states that the rules of any game may be variable.

Because of the multiplicity of meanings of words, and the idea that different language games may be being played by people who are trying to communicate with one another, it is common for there to be misunderstanding and miscommunication. Also someone may not understand the rules of the particular language game being used. To use language properly the rules must be determined. Also, it is necessary for people to understand the language game they are playing and the rules that go along with it. The language games we should play are based on our roles in and form of life.

As suggested in the discussion of Chatman's concept of small worlds, undercover police officers have to have an ability to think, speak, act, and even live like the other side – “walk the walk, talk the talk.” They have to know the unwritten meanings of words stemming from another culture: they have to be able to play different language games. Wittgenstein gives examples of language games that fit the context of undercover work, such as reporting an event and speculating about an event. Wittgenstein, in addition to Chatman, explains the semantic parts of information transformation that are not so explicit in the Shannon-Weaver model. Both Wittgenstein and Chatman explain the role and context of the language of the undercover world. This language is part of the environment of which the sender and receiver are a part. The

environment effects what information will be taken in, how it will be transformed, and what outcomes are available.

Ramirez and Colleague's Model: Information-Seeking Strategies, Uncertainty, and Computer-Mediated Communication

Ramirez and his colleagues (Ramirez, Walther, Burgoon, & Sunnafrank, 2002) present a model of computer-mediated communication (CMC), which seeks to increase the knowledge of how people seek information about other people using new technology and discover what factors can influence the methods they use to seek out this information. The authors feel that there has been inadequate research done on social information seeking using CMC. Examples of CMC include the interchange of e-mails, using search engines, using chat rooms, and all other types of online technologies. Below is the adapted model that they present (Ramirez et al., 2002, p. 218):

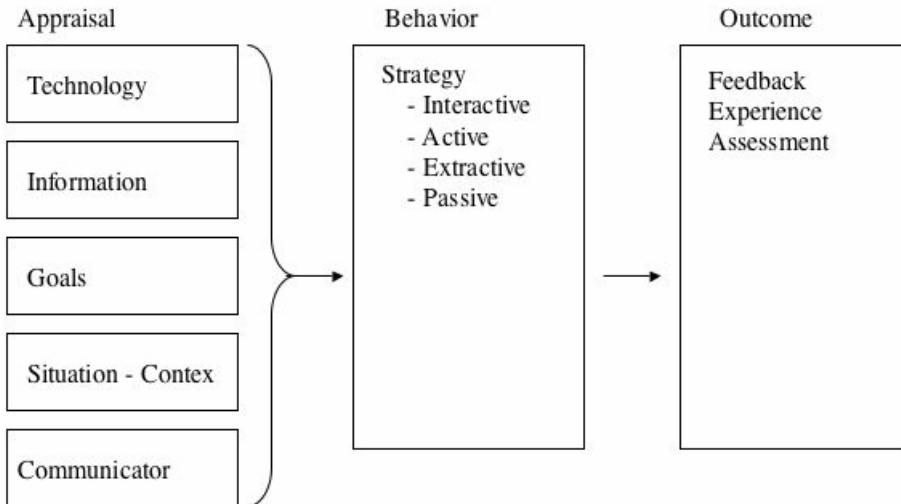


Figure 2. Conceptual model of social information seeking via CMC (adapted from Ramirez et al., 2002).

Ramirez and his colleagues believe information seeking is a goal-driven activity that is multi-faceted, and when CMC is used, the information can be sought in new and unique ways. The information-seeking process is used to find information that is then used for another

purpose. Oftentimes the searcher will try several methods of obtaining their information goals, and certain factors determine what search strategy they select. This aspect is highlighted in the appraisal section of the model. The authors give five types of factors that can influence search strategy. The first is technology related factors. People will use a certain technology based on how well they feel it will meet their goals. The second is information-related factors. For instance, how they seek information will depend on the quality and quantity of desired information. The third is goal-related factors. There may be long-term and short-term goals for an information search. Goals that require quick answers may require one type of search while other goals may require different strategies. The fourth is situational/context-related factors. The authors describe this as the “effect of external influences upon information-seeking behaviors” (Ramirez et al., 2002 p. 222). This can include such things as the time the person has to get data, the type of source the person wants to use, what technology is available, etc. Finally, the fifth is communicator-related factors. The authors describe this as characteristics or tendencies of the information seeker towards particular searching-behaviors. For example, some people may have tendencies and preferences for using e-mails to communicate with others. All, some, or any combination of these factors may have an effect on what sorts of searching behavior is used.

There are many strategies that can be employed when using CMC. Some, but not all, of these are similar to face-to-face interactions and communications. They are influenced by the five factors listed above and just as there can be many factors influencing the search strategy, there may be different search strategies used either simultaneously or in some order. The basic CMC strategies can be divided into four strategies according to the model. These are interactive, active, extractive, and passive strategies. Interactive strategies include those that involve an

interaction between the person searching for information and the person or concept about whom the searcher is trying to get. This may be done by e-mail, chat rooms, etc. Active strategies require obtaining the information needed about the person, but there is no contact with the person who is the object of the information seeker's search. E-mail and chat rooms may still be used to obtain this information, however it would be an e-mail or chat room with a third party, not the actual person. According to the authors, extractive strategies involve searching the online archives of Usenet groups or searching electronic list groups (Ramirez et al., 2002, p. 220). Passive strategies in CMC include such things as reading forwarded or carbon copied e-mails, reading a person's online profiles, or lurking in chat rooms without participating.

The outcomes portion of the model shows that the feedback, experiences, and assessments obtained by the searcher are all related to his/her information seeking behavior and the strategies he/she employs, as well as the factors that influenced his/her choice of strategies. It also shows that what they have obtained from their search and how effective they find the information will influence how they will search again.

The model of Ramirez et al. can provide significant elements to the SVI model of undercover information transformation. Their definitions of interactive, active, extractive, and passive strategies are all strategies that relate to information activities in police work. Extrapolating from the Ramirez model to that of the undercover officer, the information seeking behaviors could be defined the same way, but the examples would be different from the online format. For example, in police work, questioning a suspected criminal would be an interactive information seeking behavior. Active information seeking behavior in police work could include questioning witnesses, questioning the family of a suspected criminal, or using any other methods that would obtain information about a criminal through a third party. Extractive

behaviors could include looking in a database of crime information to obtain information on a suspect. Passive information behavior is very common in undercover work. An example of this may be infiltrating a criminal group and waiting to hear information about a crime. Some of Ramirez and his colleague's model components were used in an early version of the SVI model. This initial model is essentially linear; it shows the flow of information seekers as undercover police officers and their reactions to certain information stimuli. It is not dynamic, and in most cases, the outcome is less predictable. There is not enough explanation of the process of how undercover police officers actually work in the environment to get the information they need.

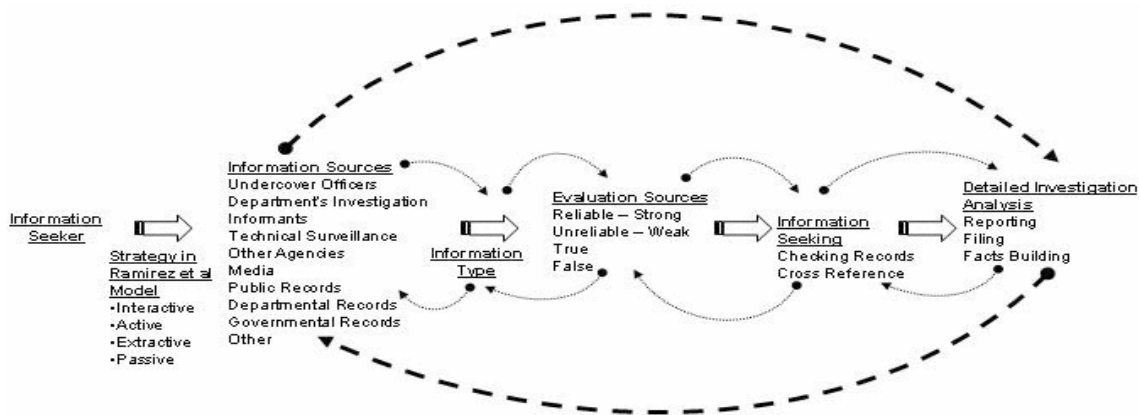


Figure 3. Early stages of SVI model.

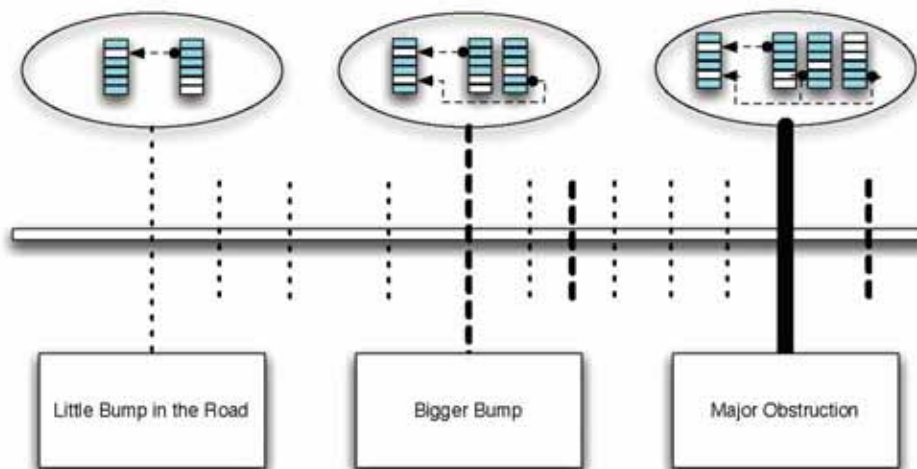


Figure 4. O'Connor hunting and gathering model (adapted by Richard Anderson from O'Connor and Copeland, 2003).

O'Connor and Copeland (2003) are looking at information seeking and gathering behavior of humans from a "street-level perspective." Previously much had been written about the use of technology in libraries or daily lives. These writings mostly neglect the human aspect of information exchange and give more importance to the actual technology and its use. The O'Connor model is a provocative approach to information seeking and gathering behavior. O'Connor's model is especially relevant to police work because it describes information seeking without a "known item." He also explains information seeking in an intense environment where there may be multiple threads or leads and where there may be a juggling and evaluation of information within the information seeking process (2003). Some of O'Connor's assertions are as follows.

The model:

- Acknowledges and enables less than optimal or satisfying targets,
- Acknowledges collaborative, social seeking behavior,
- Acknowledges the role of failure in making progress,
- Recognizes the iterative nature of seeking and questioning,
- Recognizes iterations may take place over multiple sessions,
- Recognizes multithreaded tactics,
- Recognizes generate, test, re-generate evaluation, and feedback,
- Relieves the burden of representation on the system or the cataloger, and
- Shifts the role of the information professional to an authority on achieving functional retrieval. (2003, p.145)

Definition of Terms

In describing the O'Connor and Copeland hunting and gathering model from 2003, it is important to start with a definition of some of the terms he employs. According to O'Connor (1996), there is not a fixed definition of the fundamental terms that are being used in the field of information science. O'Connor looks at the terms data, information, knowledge, and wisdom as if they are lined up in a hierarchical way. For the SVI model, the terms "experience" and "intelligence" are to be added to this hierarchy, even if they might be sub-components of this set.

O'Connor asserts data (data is the plural form of datum) as "the beginning of the progression, and input that has not yet been evaluated or given a context." The data that "have been reduced, modeled, and tested within some accepted framework" become information. Knowledge "is the set of ideas and adaptations that is working at the time" (O'Connor, 1996). According to O'Connor, the term wisdom doesn't have a universal meaning, due to its capability to hold and observe different paradigms. It can be that wisdom is the highest level of information needed in Abraham Maslow's hierarchy of needs. Ultimately, it seems to be something beyond information. In this study's context, "intelligence" is defined as the information gathered for a specific purpose and aim, which wasn't available under normal conditions to the seeker. "Experience" is defined as the approach built on previous incidents and refined because of those incidents that a seeker uses throughout the process of information seeking and gathering.

Experience is a very important part of a model for undercover information seeking. In O'Connor and Copeland's (2003) examples of information seeking by a submarine chaser and a bounty hunter, they show how experience can be used to refine and improve the information seeking process of undercover agents. Often the process of information seeking involves the lack of a "known item." This is very true of police work. O'Connor and Copeland define "known item" information seeking as "one where known attributes map directly to a known location" (2003). This is rarely the case in police work. Even if a description is given of a suspect, this does not lead to the direct location of the criminal. Much work and juggling of information must be done. This process is improved with experience. Many leads may end up in unsuccessful attempts at finding a suspect, and new information must be combined with older information and reevaluated to create new possible leads. Experience may also help information seekers to learn to filter noise and thus improve information seeking strategies. Officers may not

be aware that it is their past experiences that improve their behaviors to find the information that may lead to solving a case.

The Social Virtual Interface Model (SVI)

A social virtual interface (SVI) model assumes real people are making real information judgments in face-to-face, human-to-human situations. Social virtual interface (SVI) is a systems model for social network situations that cannot easily be explicitly measured because of the complexity of interactions impacting user behavior, together with the very real danger. SVI can be used as a substructure or framework for isolating portions of complex social phenomena for addressing "why and how?"

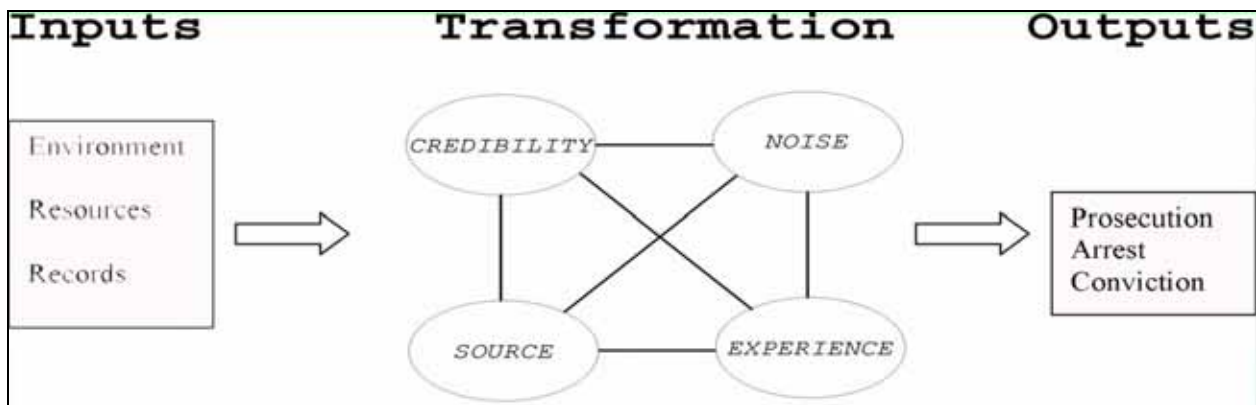


Figure 5. Aksakal social virtual interface model.

Two early sets of notes from sessions trying to push beyond the linear model are shown in Figure 6.

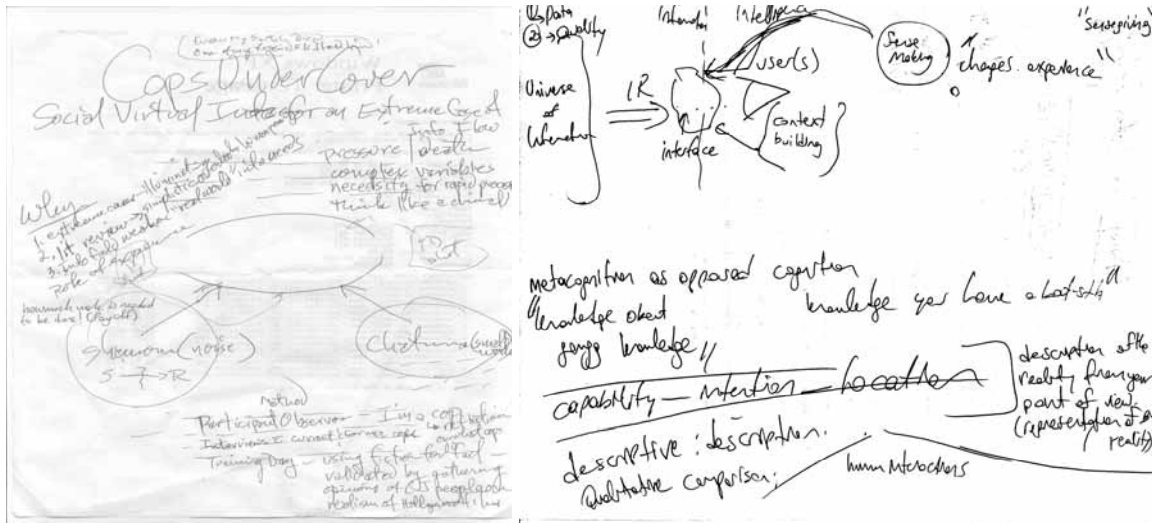


Figure 6. Examples of 3 dimensional expressions as non-linear forms on paper.

Figure 5 shows preliminary poster work that was presented by Aksakal (2004) at the ALISE Conference. The sizes, the irregular lines, and the overwriting actually demonstrate the multidimensional and multilayered nature of the model better than standard graphical representations.

For undercover cops, the information gathering process is a complicated matter. The SVI model attempts to account for a number of different aspects. An example of this is how undercover police officers get information from snitches. First, if an undercover police officer wants to get information from a snitch, there has to be trust between them (how this trust is built is another dissertation topic). Some factors that look like minor details may have significant effect on the relation between the snitch and the undercover police officer, such as reputation, previous experience of the dealings, language, communication, and body language. All these factors are subject to change from case to case.

This research will be an exploratory, qualitative, descriptive study of undercover police officers behavior. One set of variables is defined by the Supreme Court case *Terry v. Ohio* (1968). This set of variables includes practical observation, experience, intuitive investigative

techniques, and filtering the unexpected conditions of undercover police officers. Observation accounts for undercover police officers' ability to think like a criminal for rapid processing and reaction.

The information environment of the SVI model contains three parts: actors, parameters, and variables. The social network variables are actors, associate actors, connections and trustworthiness between law officers, the marginally bad and really bad guys. Actors are the law enforcement officers. Associate actors are the criminals and other society members. Social network variables are based on the actors chasing the small fish by networking targets with the help of associate actors, who are the supplementary to the law enforcement network.

Information-seeking variables are types of information seekers, sources, information, and information-seeking strategies. Information seekers are law enforcement officers at various ranks. Teams are important components of the big picture. Information sources are typically sources within police work, including criminals, police records, and politicians. The types of information involved in the system are related to the criminal investigation. Some terms used to define the type of information are intelligence and reliability.

Undercover police officers act under risky and confusing conditions in which they are required to compose accurate and swift judgments under extreme pressure. They must make alliances with "bad guys," operate within the law, assess the validity of "bad guy" information (accounting for the threats and pressures on the "bad guy," and perhaps break some laws in order to bring justice on a larger scale.

According to Dreyfus and Dreyfus (1986), experts do not do things because they necessarily know immediately the correct action. They just do actions on "instinct" – training through numerous practice and "real" situations. This statement of Dreyfus's supports the

Supreme Court's decision *Terry v. Ohio* (1968). The elements of the model (which vary from case to case) are of two sorts: diachronic, those that remain stable across time, and synchronic, those that change according to time and circumstances (O'Connor and Copeland, 2003). For instance, a criminal's given name, height, and last known address are reasonably stable or diachronic. A criminal's behaviors are likely to be strongly influenced by other circumstances and may change frequently – that is, they are synchronic. Knowing a criminal's name is not often likely to be adequate information to put the undercover police officer into a position to make an arrest. Knowing how a criminal might react under certain circumstances may be more useful in making an arrest.

Perhaps an example is appropriate here. A veteran police officer can often walk into a place such as a bar and not knowing any diachronic attributes such as name or age, pick out the “bad guys” through subtle cues of body language, dress, and eye movements. The officer might not even realize which little clues are being observed, but years of observation have had the effect of training his or her senses to recognize the synchronic clues that something is wrong.

This distinction also arises in considering relationships between undercover officers and possible informants. Knowing an informant's name and address (diachronic) is one thing; knowing how many of the bigger fish are “strong arming” the smaller fish to feed false information, or how much the smaller fish wants to straighten out his life (synchronic) is not something easily held in a database or easily evaluated for validity.

The SVI model can be used as a funnel for any information source to filter (cleanup, sanitize, debone) the unnecessary data. It can be used to help information seekers find key information they need. The SVI model might be a part of training that could reduce the time and effort for the information processing structure for the seeker and advance the features of data

needed for a specific occasion or time. This will increase the quality and speed of the flow of information to the seeker, which will enable a seeker to concentrate on the possible outcome of this information. The SVI model might also educate lawyers, politicians, and the general public about the complexities of police work.

CHAPTER 3

METHODOLOGY

Introduction

Direct observation of undercover police work by an outside researcher is essentially impossible. The threat of harm or lethal force is very real and the physical environment would require a researcher to be directly present, which would threaten the conduct of the operation. Therefore, secondary methods must be employed. The methodology of this study involves two secondary parts: first, the proposed social virtual interface (SVI) model is constructed using relevant literature from the field of information science and put together with the second part, my personal experience as an undercover police officer as a form of participant observation. Then, the SVI model is validated by conducting expert interviews with the support of an online survey.

Validity and Reliability

The standards for validating qualitative data are loosely defined, but it is important to determine what kinds of methods exist (Creswell, 1998). Some argue, however that the validation of qualitative data can only be defined in broad terms (Howe and Eisenhardt, 1990, as cited in Creswell 1998). Others feel that the qualitative research methods should mirror quantitative research in terms of determining validity and reliability, particularly to avoid criticisms from the more scientific communities (LeCompte and Goetz, 1982 as cited in Creswell 1998).

Depending on the research, varying methods may be employed to check validity and reliability. Creswell (1998) lists several procedures for verification that are commonly found in the literature concerning qualitative research: prolonged engagement and persistent observation,

triangulation, peer review or debriefing, negative case analysis, clarifying researcher bias, member checks, rich and thick description, and external audits. Prolonged engagement and persistent observation is necessary to help build trust with those being researched. This includes “learning the culture” of those being studied, listening to them, and revising the research as necessitated by learning more from those being observed (Creswell, 1998, p.202). Validity and credibility is built up through the sheer time spent with those being researched. My own time as an officer enabled prolonged observation although I was not doing formal research at the time. My status as an officer enabled trusting acceptance by officers in the current survey.

Triangulation is a term used to describe the idea of finding corroborating evidence from many different sources (Creswell, 1998). The basic idea of triangulation is that there can be more confidence in the results of research if several methods lead to the same conclusion. Peer review involves discussing the research with peers who may play “devil’s advocate” and keep a researcher honest about how he is answering questions (Creswell, 1998, p. 202). In negative case analysis, the researcher works to revise the hypothesis created in light of information he or she may have found that is negative or not in line with the hypotheses (Creswell, 1998). Member checks involve taking the research back to those that were being studied and asking them to verify or critique the conclusions and interpretations made in the paper (Creswell, 1998). Frequent contact with researchers in criminal justice and information science provided “devil’s advocates”; while meetings officers and private investigations provided a member check. Lincoln and Guba (1985, as cited in Creswell, 1998), claim that this is one of the most important factors in determining validity. A rich and thick description is a technique of writing all the details of the participants and settings of various research cases. Validity can then be determined by finding similarities between cases. The final validity procedure that Creswell presents is that

of external audits. This is where someone completely uninvolved in the research is used to verify validity. They determine “whether or not the findings, interpretations, and conclusions are supported by the data” (Creswell, 1998 p.203).

Creswell (1998) recommends that researchers using qualitative methods attempt to validate their research by using more than one of the above-mentioned validation procedures. Triangulation in this research was achieved primarily through prolonged observation, peer review, and member checking. First, because of my experience in the field of undercover work, I engaged in prolonged research with persistent observation. As Fetterman (1989, p. 46, as cited in Creswell, 1998, p. 201) points out, “working with people day in and day out, for long periods of time, is what gives ethnographic research its validity and vitality.” Expert interviews, surveys, and interviews about the survey were all used in combination to validate the hypotheses and the answers to the research questions. Peer review of the research was also done through e-mail. Colleagues were questioned about the validity of the research, and the model, additions, and changes were made in response to peer input.

In the social sciences, much has been written about using observations as research methods. In its essence, the observation can be conducted in two ways: observations with participation and observations without participation. Participant observation tries to accomplish the goal of gaining an insider’s view of the field through the researcher’s increasing familiarity and participation in the field itself (Flick, 1998). Those who argue for observation claim that it is the only way to be able to determine the practices in a field; interviews and narratives only give insights into the accounts of practices in a field (Flick, 1998).

Relevant Observer Characteristics

In order to characterize the expertise that enabled observation of undercover activities and knowledgeable analyses, my relevant observer characteristics consist of the following:

- A graduate of the Turkish National Police Academy, which is the equivalent of a BA degree.
- A police officer in the Turkish National Police, holding the rank of Deputy Inspector during undercover activity and holding rank of Captain during research.
- A law enforcement officer with over twelve years of professional experience complemented by higher formal education that includes the following:
 - An MBA and MS in CJUS
 - The Narcotics Supervisor Leadership Program by the DEA
 - The Drug Unit Commanders Academy by the DEA
 - The Combat with Smuggling and Organized Crime Training Course of the Turkish Ministry of Interior
 - The Anti-Organized Drug Trafficking Seminar at Istanbul, Turkey, by the German P.F.I. Institute
 - The Pompidou Group Meeting of the Council of Europe
 - The Educator's Certificate by the Faculty of Education at the University of Ankara
 - The Experts on European Union Training by Ankara University European Union Research Center
- I have the following experience in the field:
 - Worked for Anti-Smuggling and Organized Crimes Department.
 - Dealt with illegal narcotics trafficking, organized crime, and money-laundering investigations in cooperation with foreign state agencies.
 - Attended international meetings on transnational criminal matters to represent the Turkish Republic and contributed to the formation of Turkish policy in response to the growing organized crime and corruption threat.
 - Conducted drug-related law enforcement duties for organized crime felonies.
 - Acted as an undercover officer in downtown clubs in Istanbul.

- Conducted investigations and physical arrests for drug-related organized crimes.
 - Over 300 arrests
 - Seizures frequently exceeding 50 kg (up to 750 kg)
- Assigned to Technical Surveillance Bureau; implemented wiretaps and surveillance.
- Gathered intelligence data and conducted operations leading to multiple felony arrests.
- Researched, created, and presented educational programs to department personnel.
- Implemented a computer archival system; trained all personnel on the new program.

The Participant Observation Method: A Tool for Building the SVI Model

According to Flick, observation is a methodological skill that many use everyday (1998).

To become a better observer one must use a systematized and practiced method (Flick, 1998).

Observation “combines the visual perceptions, hearings, feelings and smelling in a useful and systematic way” (Adler and Adler, 1994, as cited in Flick, 1998). Observations, according to

Friedrichs (1975, as cited in Flick, 1998) may be classified using five different distinctions.

Friedrichs’ classification is used in the current study to acknowledge the trade-offs during the observation before and after starting them. Below are the descriptions of Friedrichs’ five distinctions used to classify observations (Schubert, 2004; Flick, 1998):

First, there is what he calls covert versus overt observation (Friedrichs, 1975, as cited in Flick, 1998). Covert means not making the observers aware of the observation, while overt means that the observers are definitely aware of the observer. The two parts of the research method are different on this aspect. When I was an active undercover officer, I was not actively doing research, but my presence was known to my fellow officers; now, taking observations from my memory is almost a form of covert observation. As I do interviews and even occasional

patrols with current undercover officers, there are two faces to my participation. On one hand, they are all aware that I have been an officer in a similar situation; on the other hand, they know that that was in the past and in a different country. So there is both an acceptance and a slight distance. They accept me as a cop and as an outside observer; this should increase the reliability of the observations.

The second distinction Friedrichs makes is between non-participant versus participant observation (1975, as cited in Flick, 1998). A participant observer is one who is part of the group being observed (Flick, 1998). Using my memory as part of the base for the SVI model means that I was a participant observer. I was a participant and looking back at that experience makes me an observer. In the interviews, I do not usually go on significant undercover operations, but my status as an officer with experience gives me participant status in my questioning and discussions.

Friedrichs' third distinction is systematic versus unsystematic observation (1975, as cited in Flick, 1998). I embrace unsystematic observation in my research because of the unexpected and chaotic nature of police information processing. In other words, I assume that systematic observations hinder my ability to capture the unexpected and unsystematic attributes of the police information processing. During my actual work as an officer, there was no formal observation, just the day-to-day work. Thinking about that work gave me general ideas and specific examples for the SVI model and for ways to ask questions from current officers. So, the second part of the research is systematic; it asks questions directly related to elements of the SVI model, then provides room for open ended questions and any direct observation that might happen.

The fourth distinction is between natural versus artificial situations (Friedrichs, 1975, as cited in Flick, 1998). This deals with whether or not the observations are being done where they would occur normally, or whether those being observed have been moved to a location that is better for the observer (Flick, 1998). Obviously, when I was an undercover officer, I used natural situations. In the current work, I have used a survey instrument, which may be thought of as an “artificial” environment, but the interviews and structured questions have taken place in natural settings, such as the officers’ normal briefing room and patrol cars.

The final distinction Friedrichs makes is between self-observation versus observing others (1975, as cited in Flick, 1998). Flick states it like this, “How much attention is paid to the researcher’s reflexive self-observation?” (Flick, 1998). In the current part of this research, I mostly observe the others, sometimes putting myself into the shoes of others to make the conversations and question answering sessions more natural for the participants. When I base components of the model or design questions from my own police work, obviously I am doing self-observation. In this respect, the role of me as an observer becomes an important and critical issue.

The methods I have chosen have advantages and disadvantages. There are always trade offs between any of the classifications of observations. For example, in covert vs. overt observation, it may be the case that telling someone they are being observed may influence their actions and behaviors, while not telling someone they are being observed may be unethical in some situations. As for participant versus non-participant observer, it may be argued that the non-participant may have a less biased observation, while the participant observer may be biased or sympathetic towards his/her subjects. However, it also could be argued that a participant observer may make subjects feel more comfortable, thus allowing more natural behaviors to

occur that a non-participant might miss. Keeping the latter in mind, I use the participant observation method in my research. The participant observation method, according to Denzin (1978), is defined as “a field strategy that simultaneously combines document analysis, interviewing of respondents and informants, direct participation and observation, and introspection” (p. 183).

The fundamental attribute of the participant observation method is that the researcher becomes a part of the field and the group being observed. The observer has experiences that are the same as those observed and also has the same perspective as the observed (Flick, 1998). The definition of participant observation can be understood by examining the seven features of participant observation listed by Jorgensen (2003, p. 18):

1. A special interest in human meaning and interaction as viewed from the perspective of people who are insiders or members of particular settings and situations and settings
2. Location in the here and now of everyday life situations and settings as the foundation of inquiry and method
3. A form of theory and theorizing stressing interpretation and understanding of human existence
4. A logic and process of inquiry that is open-ended, flexible, opportunistic, and requires constant redefinition of what is problematic, based on facts gathered in concrete settings of human existence
5. An in-depth, qualitative, case study approach and design
6. The performance of a participant role or roles that involves establishing and maintaining relationships with natives in the field
7. The use of direct observation along with other methods of gathering information

The participant observation method used in this study can be understood as a process in two respects. First, I am a participant who has privileges of gaining access to the field and to persons who are my colleagues. Second, my observations are conducted in such a way as to focus on aspects surrounding the research question. The participant observation method I am

using in this study has three stages: descriptive observation, focused observation, and selective observation (Spradley, 1980).

Descriptive observation is designed to be used at the beginning of research. Here the researcher becomes acquainted with the field and the things he is observing and is able to make general observations (Spradley, 1980). This is generally when research questions are solidified.

The second stage is the focused observation. Here, the researcher narrows his research and determines exactly what observations are essential for the research and to answer the research questions (Spradley, 1980). Finally, the researcher employs the selective observation.

According to Spradley, this is done towards the end of the data collection and is done by building on what was discovered in the focused observation (1980). The purpose of this is to find evidence to further support the research questions.

Again during the observations, I have not produced a strongly structured observation method so as to capture the complexities of information seeking and the uniqueness of undercover work. Hence, my descriptive observation refrains from being restricted and from limiting my sensitivity to the unexpected (Flick, 1998). In the selective observation stage, however, I used my online survey questions as an instrument serving to focus the discussion, in order to capture fully the relevant aspects elaborated in the focused observation stage. On the other hand, I acknowledge the limiting nature of perspective that may not be capable of grasping all details coming up at the same time. In fact, Bergmann notes that human nature has quite

limited competence of remembering and reproducing amorphous incidents of an actual social event. The participant observer has no other choice than to note the social occurrences which he was witness to mainly in a typifying, resuming, reconstructive fashion (1985, as cited in Flick, 1998, p.143).

The aforementioned problem, the limiting nature of the human perspective, is not the only problem in participant observations. Another problem is how to restrict or select

observational situations to obtain the best conditions both in terms of the visibility of what I am observing and the external validity of the conclusions relying on the observations (Flick, 1998). The nine dimensions of social situations identified by Spradley (1980) have helped me in my research to solve the aforementioned problem. The nine dimensions of social situations for observational purposes are: space, actor, activity, object, act, event, time, goal, and feeling. In other words, these are respectively the physical place(s), the people, the actions people do and the behaviors people have, other physical objects in the environment, a single behavior or action of the people, a group of activities people do that are related, the temporal order of events taking place, the things people are trying to accomplish, and the emotions expressed or felt by the people (Spradley, 1980).

In my research, it is impossible for security reasons for me to go undercover with officers and observe their information seeking behaviors. It is also impossible to see all the workings of different police departments throughout the world. In other words, I am in the position of having to select respondents as well as the environment used in the research. It is evident, in my particular case, that a specific dimension, particular (i.e. undercover) police section, particular people, particular concrete activities, etc. is needed for completing the data and reaching theoretically valid conclusions. Hence, I chose to focus on the subjects and other dimensions of the research where I am most familiar because of my past experience. In that way, I know which combination of people and situations is the best fit to my research questions in the larger setting of an undercover section of a huge police agency. By doing that, I am expecting to overcome the aforementioned validity problems and sub cultural barriers that will be mentioned in the next paragraphs and obtaining the subject set from which I may obtain generalizable and consistent conclusions which incorporate the invisible dimensions of the subject set.

Another limiting problem was accessing the undercover subculture. This is particularly important in understanding the influence of the “small worlds” of the undercover agents, as Chatman points out, and also capturing the rhetorical nuances of the “language game” of Wittgenstein, as mentioned in the previous chapter. Flick supports that idea by stating that in participant observation even more than in other qualitative methods, it becomes crucial to gain an internal perspective on the studied field and to “systematize the status of the stranger” at the same time (1991, pp. 154-155, as cited in Flick, 1998). Only the achievement of the latter enables me to view the particular in what is routine in the field. To lose this critical external perspective and to unquestioningly adopt the viewpoints shared in the field is known as “going native” (Flick, 2002).

In a way, anybody that worked in a particular situation before engaging in formal research is “coming out of native.” However, becoming familiar with the field is not enough for a systematic observation. Also, maintaining professional distance may be necessary to some degree for ethical reasons. In other words, the subjects should always know that the information the researcher is acquiring is going to be used in research, and this research will publicly be available for everyone. Koepping, in fact, contends the following:

[a researcher] has to dialectically fuse the two functions in himself, that of commitment and that of distance .. [therefore, the researcher has to be aware of] what is outlined by the notion of participation in observation, the task of which is to understand through the eyes of the other. In participating the researcher methodologically authenticates his theoretical premise and furthermore he makes the research subject, the other, not an object but a dialogical partner (1987, as cited in Flick, 2002, p. 142).

Hopefully, the problems associated with getting into the small worlds and language games of the subjects through living within the subculture is not a considerable problem for me since I have lived in a similar subculture through my job. On the other hand, maintaining professional distance might be a problem. I have overcome this by adhering and following the

aforementioned three stages of observation (i.e. descriptive, focused, and selective observations) and then using the related survey questions to guide me to what I am intending to observe.

The participant observation method I am using in building the SVI model is not perfect, and it has some limitations. One major problem with case studies is that questions can arise concerning external validity of the research and its conclusions. For instance, Flick points out that not all phenomena, especially biographical processes and comprehensive knowledge processes, are difficult to observe (1998). This is particularly relevant to my research since I am relying on what people have to say about their own biographical processes and their comprehensive knowledge of the information gathering process. The secrecy and privacy that goes along with undercover work may exacerbate the aforementioned problems. I assume that my insider past as well as the interviews conducted to validate the SVI model can reduce these problems, but no research is without complications.

Interviews: Tools for Validating the SVI Model

From the different types of interviews, including the focused interviews, semi-standardized interviews, problem-centered interviews, ethnographic interviews and expert interviews, I chose an interview technique similar to the expert interview method for validating the model proposed in this study.

Meuser and Nagel argue that an expert interview is actually a way of applying the semi-structured interview (1991, as cited in Flick, 1998). An expert interview is one where the interviewee is considered to be extremely knowledgeable in a field and is being interviewed only on the subject in which he or she is considered to be an expert. Generally the expert interviewee is considered to be a representative of the beliefs and ideas of the particular field he/she is

representing (Flick, 1998). Since the expert interviewer chose the person to interview based on his knowledge capacity in a certain area, only questions pertaining to his knowledge in that area are asked. When conducting an expert interview, it is important for the interviewer to guide the expert in a way that allows him to answer questions in his field of knowledge only; otherwise, problems may arise with the research (Flick, 1998).

Meuser and Nagel list some of the ways that expert interviews can go wrong (1991, as cited in Flick, 1998). First, they argue that it is possible for the “expert” to ruin the interview if it turns out that the person is not actually an expert in the field at all. Second, the expert may become involved in discussing controversial issues in the field or current internal matters and fails to talk about the research questions that the interviewer is attempting to obtain comments about. Third, the expert may choose to discuss matters that are personal to himself or herself instead of discussing matters in which he or she has expertise. Finally, Meuser and Nagel argue that another form of interview called “rhetoric interview” is conducted by an expert giving a lecture on his/her knowledge instead of joining the question-answer part of the interview (1991, as cited in Flick, 1998). If the expert does not discuss the research topic, this type of expert interview will fail to yield usable results.

Sampling was purposeful because the SVI model applies to a defined group (Miles and Huberman, 1994 as cited in Creswell, 1998). The sampling was theory-based because it found examples “of a theoretical construct” and allowed examination of that construct. The sampling was also what Miles and Huberman term “homogeneous” (all were police officers), which enables focusing, simplifying, and facilitating group interviewing (Miles and Huberman, 1994, as cited in Creswell, 1998).

Approach to Data Gathering

Since the primary aim of the research is to determine if undercover police officers would validate the SVI model, an approach was needed that could gather group and expert opinions.

Dalkey (1969) asserts that the Delphi method is “a method of eliciting and refining group judgments. The rationale for the procedures is primarily the age-old adage ‘two heads are better than one,’ when the issue is one where exact knowledge is not available.”

The essence of this method is that the group of people, who are experts on what they are doing, will establish a synergy platform that will reflect the best application of the ideas. The Delphi method aims to explore the invisible responses as well as the visible and concrete responses from the experts. According to Dalkey (1969), the main elements of the method consist of three features:

1. Anonymity: this is most important aspect of the Delphi method. This is required in such a way that no other participant knows who else is taking part in the research. The participants in this research are anonymous and will not be traced back.
2. Iteration and controlled feedback: Data is gathered in controlled intervals.
3. Statistical group response: A group interview is conducted after the online data gathered to minimize the possible misunderstandings.

The method for this research made use of the concepts of anonymity, iteration, controlled feedback, and statistical group response, although these were applied in a different way than the classical Delphi Method. Actually, there were 2 phases to the research using Delphi-like methods. The first phase was construction of the questions on the survey. The initial set of questions was sent to experts via email for critique. Their comments were used to refine the question set, which was sent back for additional critique. Three iterations of this process took place. None of the experts were aware of the identity of the others.

The second phase involved the asking of the survey questions followed by the conducting of personal interviews. This is not “iteration” in the classic sense of the Delphi Method since some of the same people were questioned twice. A small group of nine was interviewed after the survey in order to elicit more detail and to “minimize the possible misunderstandings” (Dalkey, 1969)

In order to guide a method with roots in classical Delphi but with some modifications, I sought guidance from an additional source. It is quite a structured survey directed to experts (Cline, 2000). The steps of the Delphi method are listed in the literature (Linstone, 1978). At the onset, a team for conducting and monitoring the interview is formed. Then, the subjects who are experts in the fields are determined. Third, the questionnaire is developed. Fourth, the questionnaire is tested for reliability by getting advice from experts. Next, the questionnaire is administered to the selected subjects of the interviews. At the sixth stage, the responses are collected and analyzed. Based on the responses, the next questionnaire can be prepared and distributed, and then the responses are collected and analyzed. This last step is repeated as much as it is needed. At the last stage, the final analysis is conducted and the results are prepared. The way of thinking is if experts principally agree about a subject matter, their output is more likely to be valid than the output of those who are not experts, and experts are expected to be accurate about questions in their field (Linstone, 1978). The problem with this is that when experts are together in a room, the dominant voice might be heard more (Gordon, 1994). To minimize this kind of a problem in this study, the survey was designed online and in some cases handed out in person, and the group interview was held at the final stage of the data collection.

The steps enumerated by Linstone (1978) can be summarized as finding experts to be interviewed, preparing a questionnaire, administering the questionnaire, and analyzing the results.

In my research, I used an interview which could be put at the intersection of the Delphi method and expert interviews. In this process, selecting the expert did not constitute a difficulty for me because of my familiarity with the dimensions (i.e. people, settings, etc.) of the research space. However, operationalizing the literature containing the theories developed by Shannon and Weaver, Chatman, Wittgenstein, and O'Connor and Copeland through the questionnaire has been a challenging task.

The main point of this research was to establish a valid consensus among experts, who are undercover police officers that the SVI model is a useful tool to explain the phenomenon of the undercover police officers' information seeking and gathering behavior. By means of the Delphi method, experts from the field were first identified from the attendees of Drug Enforcement Agency (DEA) training for the Drug Unit Commander Academy (DUCA) and asked to participate in the research. During a two-week DEA training session in which I was a full participant, I was able to discuss the questions and the foundational components of the SVI model with drug unit commanders from around the United States. Due to the participants' ranks and the nature of their work, the design of the survey guarantees their anonymity.

The Online Questionnaire

The online questionnaire has ten parts including the open ended questions as shown in table 1: demographics, work profession, work place, information sources, information noises, Chatman's theory, Shannon's and Weaver's theory, Wittgenstein's theory, and O'Connor and

Copeland's theory. The questions about the demographics, work profession, work place, information sources, and information noises are asked for descriptive and identification purposes. More specifically, they are asked to identify the subjects, their level of expertise, and perceived sources and noises of information processing methods of undercover police. On the other hand, the questions derived from the theories postulated by Chatman, Shannon and Weaver, Wittgenstein, and O'Connor and Copeland are asked in order to test the applicability of them to the field of undercover police information processing.

Table 1

Structure of the Questionnaire

Question Group	Number of Questions	Corresponding Items in the SVI Model	Corresponding Stage of the SVI Model
Demographics	3	Environment	Input Stage
Work Profession	4	Resources	
Work Place	3	Records	
Information Sources	20	Sources	Transformation Stage
Information Noises	17	Noise	
Chatman Theory	12	Credibility	
Shannon and Weaver Theory	13	Source and Noise	
Wittgenstein Model	12	Source and Noise	
O'Connor and Copeland Model	7	Experience	
Output Variables		Arrest Prosecution Conviction	Output Stage

There are three questions about the demographics of the participants. These are the questions on age, gender and education. The responses to these questions help in identifying the underlying conditions of the subject. This corresponds to the input stage in my proposed model.

- Demographics-Q-1: What is your age?
 - Age is categorized in six groups: 18-24, 25-34, 35-44, 45-54, 55-64, and above and equal to 65.
- Demographics-Q-2: What is your gender?
 - Gender has two categories: male and female.
- Demographics-Q-3: What is your education?
 - The education level has four values: high school, some college, college graduate and graduate school.

There are three questions related to the work place of the subject. The responses to those questions, like the responses to the demographics question, help in identifying the underlying conditions of the subject. This corresponds to the input stage in my proposed model.

- Work_Place-Q-1: What is the estimated population of your department's area?
 - The response has five values: Less than 20,000; 20,001-50,000; 50,001-100,000; 100,001-250,000; and Over 250,001.
- Work_Place-Q-2: What is your department setting?
 - The response has four values: rural, urban, suburban, and other.
- Work_Place-Q-3: Where is your jurisdiction?
 - The response has four values: state, city, county, and other.

There are four questions related to work profession of the subject. The responses to these questions give an idea about the expertise level of the subject. This corresponds to the input stage in my proposed model.

- Work_Profession-Q-1: Please select the job title that best describes your current position.
 - The response has seventeen values: Commanding officer, correction officer, sheriff, chief, commander, patrolman, officer, trooper, ranger, training officer and related personnel, captain, corporal, investigator, detective, inspector, sergeant, and lieutenant.
- Work_Profession-Q-2: How long have you been working with the department?
 - The response has five values: 1-11 months, 1-2 years, 3-5 years, 6-12 years, and at least 13 years. This question gives an idea about the experience of the subject within the department.
- Work_Profession-Q-3: How long have you been in this position?

- The response has five values: 1-11 months, 1-2 years, 3-5 years, 6-12 years, and at least 13 years. This question gives an idea about the experience of the subject within the department.
- Work_Profession-Q-4: Have you ever worked undercover in your profession?
 - The response has six values: yes 1-11 months, yes 1-2 years, yes 3-5 years, yes 6-12 years, yes at least 13 years, and no. This question gives an idea about the experience of the subject within the department.

There are ten questions related to the information sources available to the subject. The responses to each of the questions have seven values: *always, usually, frequently, sometimes, rarely, never*, and *unsure*. The responses to these questions reveal the information sources at the transformation stage of my proposed SVI model.

- Information_Sources-Q-1: How often are you using other undercover police officers as the information source?
- Information_Sources-Q-2: How often are you using departmental investigations as the information source?
- Information_Sources-Q-3: How often are you using informants as the information source?
- Information_Sources-Q-4: How often are you using criminal case history as the Information source?
- Information_Sources-Q-5: How often are you using technical surveillance as the information source?
- Information_Sources-Q-6: How often are you using other agencies as the information source?
- Information_Sources-Q-7: How often are you using media as the information source?
- Information_Sources-Q-8: How often are you using public records as the information source?
- Information_Sources-Q-9: How often are you using departmental records as the information source?
- Information_Sources-Q-10: How often are you using governmental records as the information source?

There are seventeen questions related to the information noises in the information acquisition process of the subject. The responses to each of the questions have seven values:

always, usually, frequently, sometimes, rarely, never, and unsure. The questions aim at obtaining internal, external, informal and formal sources for noise. The responses to these questions reveal primarily the information noise at the transformation stage of my proposed SVI model.

- Information_Noises-Q-1: Do the laws provide barrier for your job?
- Information_Noises-Q-2: Do the regulations provide barrier for your job?
- Information_Noises-Q-3: Do the other officers provide barrier for your job?
- Information_Noises-Q-4: Does the bureaucracy provide barrier for your job?
- Information_Noises-Q-5: Do the politicians provide barrier for your job?
- Information_Noises-Q-6: Does the police review board provide barrier for your job?
- Information_Noises-Q-7: Do the informants provide barrier for your job?
- Information_Noises-Q-8: Do the bad guys provide barrier for your job?
- Information_Noises-Q-9: Do your family provide barrier for your job?
- Information_Noises-Q-10: Do the supervisory officers provide barrier for your job?
- Information_Noises-Q-11: Do the bad guys' families provide barrier for your job?
- Information_Noises-Q-12: Do the department structure provide barrier for your job?
- Information_Noises-Q-13: Does your personal stress level provide barrier for your job?
- Information_Noises-Q-14: Does the chain of command provide barrier for your job?
- Information_Noises-Q-15: Does the inconsistent communication provide barrier for your job?
- Information_Noises-Q-16: Does your personal safety provide barrier for your job?
- Information_Noises-Q-17: Does the work overload provide barrier for your job?

There are twelve questions based on the theory of Chatman. These questions help to operationalize the credibility at the transformation stage of my proposed model. The responses to each of the questions have seven values: *always, usually, frequently, sometimes, rarely, never,* and *unsure*.

- Chatman-Q-1: Undercover police have strong attitudes and beliefs about the significance of their jobs
- Chatman-Q-2: Undercover police form their own brotherhood
- Chatman-Q-3: Undercover police tend to socialize with each other in their spare time
- Chatman-Q-4: Undercover work requires more emphasis on details than other police work
- Chatman-Q-5: Undercover police would prefer to live in a neighborhood where their colleagues live
- Chatman-Q-6: Undercover police form their own world
- Chatman-Q-7: Undercover teams have a strong sense of unity and belongingness
- Chatman-Q-8: Undercover work is very different from routine police work
- Chatman-Q-9: Undercover work is just the same as any other police work
- Chatman-Q-10: Undercover police need to have different approaches than other police
- Chatman-Q-11: Undercover police form their own community
- Chatman-Q-12: Undercover police need to have a procedures checklist for handling situations

There are thirteen questions based on the theory of Shannon and Weaver. These questions help to operationalize primarily the source and noise at the transformation stage of my proposed model. The responses to each of the questions have seven values: *always, usually, frequently, sometimes, rarely, never,* and *unsure.*

- Shannon-Q-1: I trust an informant.
- Shannon-Q-2: I trust an informant even when I have no other corroborating evidence.
- Shannon-Q-3: I trust an informant when I have a history with the informant.
- Shannon-Q-4: I trust an informant when another good source says he or she is dependable.
- Shannon-Q-5: The meaning of words that undercover police use in the office changes when the undercover officer is on the streets.
- Shannon-Q-6: Politicians interfere with good undercover work.
- Shannon-Q-7: Review boards get in the way of good undercover work.

- Shannon-Q-8: Legislators interfere with good undercover work.
- Shannon-Q-9: Politicians understand undercover work.
- Shannon-Q-10: Undercover police have to “think like the bad guy.”
- Shannon-Q-11: Understanding how words were used differently on the streets was a problem for me in the beginning of my profession.
- Shannon-Q-12: Undercover police have to fit in or pass for bad guys.
- Shannon-Q-13: The families of undercover cops understand and support their work.

There are twelve questions based on the theory of Wittgenstein. These questions help to operationalize the source and noise at the transformation stage of my proposed model. The responses to each of the questions have seven values: *always, usually, frequently, sometimes, rarely, never,* and *unsure*

- Wittgenstein-Q-1: Undercover police have a distinct language or verbal communication.
- Wittgenstein-Q-2: Undercover police have their own special meanings for regular words.
- Wittgenstein-Q-3: Undercover police have to speak the same language as informers.
- Wittgenstein-Q-4: Undercover team members have a language that only they would understand.
- Wittgenstein-Q-5: Undercover police and bad guys are able to speak the same language.
- Wittgenstein-Q-6: Undercover cops use their own language when talking to each other.
- Wittgenstein-Q-7: Undercover police learn the language of the streets from their colleagues.
- Wittgenstein-Q-8: Use a different way of speaking than I do normally.
- Wittgenstein-Q-9: Use different words than I do in other aspects of my life.
- Wittgenstein-Q-10: When undercover, encounter people who use language differently than I do.
- Wittgenstein-Q-11: Find that working undercover has its own unwritten rules.
- Wittgenstein-Q-12: Use different terminology with colleagues.

There are seven questions based on the model of O'Connor and Copeland. These questions help primarily to operationalize the experience at the transformation stage of my proposed model. O'Connor and Copeland's model conveys more than that information. It gives a clue about the intuitive side of police information processing. But, for the purpose of this research, I will only use those questions in operationalizing the credibility and experience in the proposed SVI model. The responses to each of the questions have seven values: *always, usually, frequently, sometimes, rarely, never, and unsure.*

- O'Connor-Q-1: Undercover work is a simple (doesn't mean easy) process.
- O'Connor-Q-2: Undercover work follows the same set of rules as general police work.
- O'Connor-Q-3: Undercover work requires juggling between different bits of information.
- O'Connor-Q-4: Information seeking and gathering in undercover work requires rapidly changing and mixing tasks.
- O'Connor-Q-5: Undercover work has more gray areas than regular police work.
- O'Connor-Q-6: Undercover work requires the evaluating and reevaluating of pieces of information.
- O'Connor-Q-7: Making decisions without enough information is commonly done in undercover work.

There are eight open-ended questions asked to get more information that might be neglected by the close-ended questions out of the respondents. These questions are asked primarily to enable the respondents to express more of what they, themselves, have to say.

- Open-ended-Q-1: What factors can influence you in your information seeking and gathering?
- Open-ended-Q-2: How do you start your ground work to solve a specific task?
- Open-ended-Q-3: How do you search for and use your information sources for a specific case/assignment? Is there a pattern for this?
- Open-ended-Q-4: How do you interact with your information sources?
- Open-ended-Q-5: How do you match the expectations of your superiors with your ways of finding information?

- Open-ended-Q-6: What are your primary information sources for your work?
- Open-ended-Q-7: How do you gather information?
- Open-ended-Q-8: How did you learn to fit-in?

Hypotheses

The social virtual interface model components and relationships were hypothesized: working undercover officers will find the SVI model an accurate representation of their work.

1. Responses to survey questions will show a strong positive relationship with the four components of the model
2. Responses to the open-ended questions will show a strong positive relationship with the four components of the model
3. Responses to open-ended questions will show a strong acceptance of the multi-faceted nature of information flow presented in the SVI model

The Subjects

The subjects are law enforcement personnel of various ranks, age, education level, and so forth. The subjects are selected based on their availability as well as their affiliation with an undercover police division.

My main target for the online survey was the Drug Enforcement Agency (DEA) trainees of Drug Unit Commander Academy 48 (DUCA-48), consisting of 56 supervisors, and the DEA Dallas Division Narcotics Supervisor Leadership Program, consisting of 72 supervisors. My first mission was to make sure that those selected were what Delphi researchers would regard as “expert participants.” This was accomplished by approaching the participants in the DEA Training. The participants in this training were drug unit commanders who had been nominated by their chiefs to be candidates to DUCA and had been approved by DEA headquarters. So the DEA set the parameters for what we would consider expertise in the field. This group was

limited to online respondents only. A brief description about the study and a link to the online questionnaire were emailed to undercover police officers. The online survey was available between January 19, 2005, and May 31, 2005. A total of 128 online survey invitations were sent to undercover police officers affiliated with DEA training. 60 of 128 responded to the online questionnaire; in addition, 40 police officers filled out the questionnaire in person. Data for in-person surveys were gathered at various locations. These were made through personal contacts in various police departments and DEA. Overall there are 91 valid respondents. Data entered by the participants were downloaded directly to a database and imported to a statistical program by using Zope. Descriptive statistics (frequencies, modes, etc.) were used to describe the sample characteristics.

I selected undercover police officers to conduct the survey for the research because they characterized the most complex and extreme unit in the sense of information seeking and gathering in law enforcement. If this group accepts the SVI model, then it could be considered validated.

The SVI Model

In this section, I will develop my model based on the literature and my observations as a participant. The results of my observations as a participant are as follows:

Information sources for undercover police officers include departmental investigations, informants, criminal case histories, technical surveillance, other agencies, media, public records, departmental records, and governmental records.

Information sources are influenced by the personal and work place characteristics, as well as the degree of profession of the undercover police officers. Therefore, I summarize them as the

environment, resources, and records. The combination of these three items constitutes input in my proposed model.

The output in my model consists of arrest, prosecution, and conviction rates. These three are needed together because only the combination of them represents the success of the undercover investigation based on the decisional consensus of the three major and separate branches of a democratic governing system. In other words, the arrest represents the output of the information decision of the executive branch, the prosecution represents the output of the information decision of the legislative branch, and the conviction represents the output of the information decision of the judiciary branch.

There is an information processing element in between the inputs and outputs of the information processing system. I named this element the transformation element in my proposed SVI model. The transformation element is modeled on the work of Shannon and Weaver; the validity and reliability of their model has been supported by its significance in multiple areas over fifty years. If the use of their model is considered appropriate by undercover officers, it will have strong support. According to their model, source and noise are the major aspects of the transformation element. My observations suggest a close relationship between the concept of “noise” and many of the distracting or hampering elements of the undercover police environment. Thus, the reliability of information sources, such as trust in the informants, and external and internal interventions, such as the interventions from the legislatures, prosecutors, politicians, chain of command, public, peers, subculture, etc., influence the information decision process of the undercover police officers. However, those influences vary in accordance with their credibility and the experience of the officers. In other words, if the source is not a credible one, the officers give less heed to it in their information processing, and vice versa. Similarly, the

officers assess the credibility of the information sources and noise based on their experience. Subsequently, there is a close interaction among the four elements: credibility, experience, source and noise. O'Connor's arguments also confirm that observation.

In summary, as a result of the observations and literature, I have generated a model based on personal experience and expertise together with elements taken from information science literature. Then I surveyed experts in the field to validate the components of the social virtual interface model, as well as the general, non-linear, not "perfect" and "make-shift" nature of information flow and processing in street-level undercover police work.

CHAPTER 4

FINDINGS AND ANALYSIS

The proposed social virtual interface (SVI) model was tested with the help of semi-structured expert interviews inspired by the Delphi method. A questionnaire was prepared based on the literature and my observations as a participant. There were 91 valid surveys. Surveys which were less than 50% completed were determined to be invalid and were subsequently thrown out. The valid data is described in tables 2 – 99.

Table 2

Descriptive Statistics for the Age Demographic

	Age	Frequency	Percent Valid	Percent	Cumulative Percent
Valid	25-34	14	15.4	16.1	16.1
	35-44	45	49.5	51.7	67.8
	45-54	25	27.5	28.7	96.6
	55-64	3	3.3	3.4	100.0
	Total	87	95.6	100.0	
Total		91	100.0		

As can be seen from the frequency table 2, which corresponds to question number one, 45 of the 87 respondents were in the range of 35-44, which is 51.7% of the overall respondents. Twenty-five of the 87 respondents were in the range of 45-54, which is 28.7% of the overall respondents. Fourteen of the 87 respondents were in the range of 18-24, which is 16.1% of the overall respondents. Three of the 87 respondents were in the range of 55-64, which is 3.4% of the overall respondents, and 4 of 91 participants who answered the survey did not answer this question.

Table 3

Descriptive Statistics for the Gender Demographic

	Gender	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	81	89.0	93.1	93.1
	Female	6	6.6	6.9	100.0
	Total	87	95.6	100.0	
Total		91	100.0		

As can be seen from the frequency table 3, which corresponds to question number two, 81 of the 87 respondents were male, which is 93.1% of the overall respondents. Six of the 87 respondents were female, which is 6.9% of the overall respondents, and 4 of the 91 participants who answered the survey did not answer this question.

Table 4

Descriptive Statistics for Professional Experience

How long have you been working with the department?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1-2 years	3	3.3	3.4	3.4
	3-5 years	5	5.5	5.7	9.1
	6-12 years	16	17.6	18.2	27.3
	13+ years	64	70.3	72.7	100.0
	Total	88	96.7	100.0	
Total		91	100.0		

As can be seen from the frequency table 4 – which corresponds to question number 3, the time that the participants has been working with the department – 64 of the 88 respondents were working with their department for more than 13 years, which is 72.7% of the overall

respondents. Sixteen of the 88 respondents were working with their department for 6-12 years which is 18.2% of the overall respondents. Five of the 88 respondents were working with their department for 1-2 years which is 5.7% of the overall respondents, 3 of the 88 respondents started working with their department less than a year ago, which is 3.4% of the overall respondents, and 3 of the 91 participants who answered the survey did not answer this question.

Table 5

Descriptive Statistics of the Work Place for the Population of the Department

What is the estimated population of your department's area?

	Frequency	Percent Valid	Percent Cumulative
Valid Less than 20,000	2	2.2	2.3
20,001 to 50,000	11	12.1	14.8
50,001 to 100,000	9	9.9	25.0
100,001 to 250,000	19	20.9	46.6
Over 250,001	47	51.6	100.0
Total	88	96.7	100.0
<hr/>			
Total	91	100.0	

As can be seen from the frequency table 5 – which corresponds to question number 4, the population of the department that participant is working with – 47 of the 88 respondents were working in an area where the population is over 250.000, which is 53.4% of the overall respondents. Nineteen of the 88 respondents were working in an area where the population is over 100.001-250.000, which is 21.6% of the overall respondents. Eleven of the 88 respondents were working in an area where the population is over 20.001-50.000, which is 12.5% of the overall respondents. Nine of the 88 respondents were working in an area the population is over 50.001-100.000, which is 10.2% of the overall respondents. Two of the 88 are serving for a population of less than 20.000, which is 2.3% of the overall population, and 3 of the 91 participants who answered the survey did not answer this question.

Table 6

Descriptive Statistics of the Work Place for Department Jurisdiction

Your jurisdiction				
	Frequency	Percent	Valid Percent	Cumulative Percent
Valid State	10	11.0	11.4	11.4
City	68	74.7	77.3	88.6
County	5	5.5	5.7	94.3
Other	5	5.5	5.7	100.0
Total	88	96.7	100.0	
Total	91	100.0		

As can be seen from the frequency table 6 – which corresponds to question number 5, jurisdiction of the department in which the participant is working – 68 of the 88 respondents were working in a city jurisdiction area, which is 77.8% of the overall respondents. Ten of the 88 respondents were working in a state jurisdiction area, which is 11.4% of the overall respondents. 5 of the 88 respondents were working in a county area, which is 5.7% of the overall respondents. The remaining 5% is working in someplace other than these jurisdictions, and 3 of the 91 participants who answered the survey did not answer this question.

Table 7

Descriptive Statistics of the Work Place for the Department Setting Distribution of the Participants

Your department setting				
	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Rural	3	3.3	3.4	3.4
Urban	56	61.5	63.6	67.0
Suburban	24	26.4	27.3	94.3
Other	5	5.5	5.7	100.0
Total	88	96.7	100.0	
Total	91	100.0		

As can be seen from the frequency table 7 for question number 6, which corresponds to the department setting in which the participant is working, 56 of the 88 respondents were working in an urban department setting, which is 63.6% of the overall respondents. Twenty-four of the 88 respondents were working in a suburban department setting, which is 27.3% of the overall respondents. Three of the 88 respondents were working in a rural department setting, which is 3.4% of the overall respondents. Five of the 88 respondents were working in another department setting, which is 5.7% of the overall respondents, and 3 of the 91 participants who answered the survey did not answer this question.

Table 8

Descriptive Statistics of the Work Profession for Rank Distribution

Please select the job title that best describes your current position

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Commanding Officer	5	5.5	6.1	6.1
Commander	10	11.0	12.2	18.3
Patrolman	1	1.1	1.2	19.5
Officer	3	3.3	3.7	23.2
Training Officer and related personnel	1	1.1	1.2	24.4
Captain	5	5.5	6.1	30.5
Corporal	3	3.3	3.7	34.1
Investigator	10	11.0	12.2	46.3
Detective	24	26.4	29.3	75.6
Sergeant	18	19.8	22.0	97.6
Lieutenant	2	2.2	2.4	100.0
Total	82	90.1	100.0	
Total	91	100.0		

As can be seen from the frequency table 8 for question number 7, which corresponds to rank or title of the participant, 24 of the 82 respondents hold the rank of detective, which is

29.3% of the overall respondents. Eighteen of the 82 respondents hold the rank of sergeant, which is 22.0% of the overall respondents. Ten of the 82 respondents hold the rank of investigator, which is 12.2% of the overall respondents. Ten of the 82 respondents hold the rank of commander, which is 12.2% of the overall respondents. Five of the 82 respondents hold the rank of commanding officer, which is 6.1% of the overall respondents. Five of the 82 respondents hold the rank of captain, which is 6.1% of the overall respondents. Three of the 82 respondents hold the rank of corporal, which is 3.7% of the overall respondents. Three of the 82 respondents hold the rank of officer, which is 3.7% of the overall respondents. Two of the 82 respondents hold the rank of lieutenant, which is 3.7% of the overall respondents. One of the 82 respondents holds the rank of patrolman, which is 1.2% of the overall respondents. One of the 82 respondents holds the rank of training officer and related personnel, which is 1.2% of the overall respondents. As the figures show, the majority of the participants consisted of either ranked officers or had a post that was in charge of command, and 9 of the 82 participants who answered the survey did not answer this question.

Table 9

Descriptive Statistics of the Work Profession for the Length of Time of the Participants

How long have you been in this position?

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 1-11 Months	11	12.1	12.5	12.5
1-2 Years	16	17.6	18.2	30.7
3-5 Years	22	24.2	25.0	55.7
6-12 Years	26	28.6	29.5	85.2
13 + Years	13	14.3	14.8	100.0
Total	88	96.7	100.0	
Total	91	100.0		

As can be seen from frequency table 9 for question number 8, which corresponds to participants' length of time at their current position, 26 of the 88 respondents' length of time in their current position is 6-12 years, which is 29.5% of the overall respondents. Twenty two of the 88 respondents' length of time in their current position is 3-5 years, which is 25.0% of the overall respondents. Sixteen of the 88 respondents' length of time in their current position is 1-2 years, which is 18.2% of the overall respondents. Thirteen of the 88 respondents' length of time in their current position is 13 + years, which is 14.8% of the overall respondents. Eleven of the 88 respondents' length of time in their current position is 1-11 months, which is 12.5% of the overall respondents, and 3 of the 91 participants who answered the survey did not answer this question.

Table 10

Descriptive Statistics of the Work Profession for Participants' Duration as Undercover Officers

Have you ever worked undercover in your profession?				
	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Yes-1-11 Months	13	14.3	15.1	15.1
Yes-1-2 Years	10	11.0	11.6	26.7
Yes-3-5 Years	16	17.6	18.6	45.3
Yes-6-12 Years	24	26.4	27.9	73.3
Yes-13 + Years	3	3.3	3.5	76.7
No	20	22.0	23.3	100.0
Total	86	94.5	100.0	
Total	91	100.0		

As can be seen from frequency table 10 for question number 9, which corresponds to the duration of time the participants worked undercover, 24 of the 86 respondents worked as undercover for 6-12 years, which is 27.9% of the overall respondents. Twenty of the 86 respondents had never worked undercover, which is 23.3% of the overall respondents. Sixteen

of the 86 respondents worked undercover for 3-5 years, which is 18.6% of the overall respondents. Twelve of the 86 respondents worked undercover for 1-11 months, which is 14.0% of the overall respondents. Ten of the 86 respondents worked undercover for 1-2 years, which is 11.6% of the overall respondents. Three of the 86 respondents worked undercover for 13 + years, which is 3.5% of the overall respondents, and 4 of the 86 participants who answered the survey did not answer this question.

Table 11

Descriptive Statistics of the Demographics for Participants' Education Level

What is your education level				
	Frequency	Percent Valid	Percent	Cumulative Percent
Valid High School	3	3.3	3.4	3.4
Some College	31	34.1	35.6	39.1
College Graduate	37	40.7	42.5	81.6
Graduate School	16	17.6	18.4	100.0
Total	87	95.6	100.0	
Total	91	100.0		

As can be seen from frequency table 11 for question number 10, which corresponds to participants' education level, 37 of the 87 respondents were college graduates, which is 42.5% of the overall respondents. Thirty-one of the 87 respondents had some college, which is 35.6% of the overall respondents. Sixteen of the 87 respondents had attended graduate school, which is 18.4% of the overall respondents. Three of the 87 respondents were high school graduates, which is 3.4% of the overall respondents, and 4 of the 87 participants who answered the survey did not answer this question.

The Analysis of Descriptive Statistics for the Input Stage Indicators

The input stage of the SVI model consists of three question groups; demographics, work profession, and work place. The descriptive statistics shown on tables 2-11 for the input variables indicate that the number of missing values is not considerable.

The demographics indicators – tables 2, 3, and 11 – show that an average subject is male, around 35-44 years old, and has a college degree. The work place indicators – tables 4, 5, and 6 – show that an average respondent works in an urban part of a city with a minimum population of 250,000. The work profession indicators – tables 3, 7, 8, and 9 – show that the average participant’s rank is a command position, and he/she has been working for 13+ years in the department, and 6-12 years in the undercover profession, and 6-12 years in the current position. These averages briefly indicate that I chose subjects from among middle age, middle rank professionals working in midsize agencies in midsize cities. Table 12 summarizes these findings.

Table 12

Summary of the Input Stage

Question Group	Question Number	Mode	Validation Percentages (%)	Corresponding Items in the SVI Model	Corresponding Stage of the SVI Model
Demographics (3)	1	35-44 (51.7)	67.8 (25-44)	Environment Resources Records	Input Stage
	2	Male	93.1		
	10	College grad (42.5)	60.9		
Work Profession (4)	3	13+	72.7		
	7	Ranked officer	93		
	8	6-12 years	29.5		
Work Place (3)	9	6-12 years	77		
	4	>250.001	53.4		
	5	City	77.3		
	6	Urban	63.6		

The Analysis of Descriptive Statistics for the Transformation Stage Indicators

Information Sources

Table 13

Descriptive Statistics of Other Undercover Police Officers as Information Sources (Q. 50.1)

Other undercover police officers				
		Frequency	Percent Valid	Percent Cumulative
Valid	Always	15	16.5	16.7
	Usually	30	33.0	33.3
	Frequently	23	25.3	25.6
	Sometimes	19	20.9	21.1
	Rarely	3	3.3	3.3
	Total	90	98.9	100.0
Total		91	100.0	

As can be seen from frequency table 13 – which corresponds to question number 50.1, “Other undercover police officers” – 30 of the 90 respondents (33.3%) chose *usually*, 23 of the 90 respondents (25.6%) chose *frequently*, 19 of the 90 respondents (21.1%) chose *sometimes*, 15 of the 90 respondents (16.7%) chose *always*, 3 of the 90 respondents (3.3%) chose *rarely*, and 1 of the 91 participants who answered the survey did not answer this question.

Table 14

Descriptive Statistics for Departmental Investigations Used as Information Sources (Q. 50.2)

Departmental investigations				
		Frequency	Percent Valid	Percent Cumulative
Valid	Always	13	14.3	14.4
	Usually	27	29.7	30.0
	Frequently	28	30.8	31.1
	Sometimes	20	22.0	22.2
	Rarely	2	2.2	2.2
	Total	90	98.9	100.0
Total		91	100.0	

As can be seen from frequency table 14, which corresponds to question number 50.2, “departmental investigations,” 28 of the 90 respondents (31.1%) chose *frequently*, 27 of the 90 respondents (30.0%) chose *usually*, 20 of the 90 respondents (22.2%) chose *sometimes*, 13 of the 90 respondents (14.4%) chose *always*, 2 of the 90 respondents (2.2%) chose *rarely*, and 1 of the 91 participants who answered the survey did not answer this question.

Table 15

Descriptive Statistics for Use of Informants as Information Sources (Q. 50.3)

Informants				
	Frequency	Percent	Valid Percent	Cumulative Percent
Always	5	5.5	5.6	5.6
Usually	30	33.0	33.3	38.9
Frequently	38	41.8	42.2	81.1
Valid Sometimes	15	16.5	16.7	97.8
Rarely	1	1.1	1.1	98.9
Never	1	1.1	1.1	100.0
Total	90	98.9	100.0	
Total	91	100.0		

As can be seen from frequency table 15, which correspond to question number 50.3, “Informants,” 38 of the 90 respondents (42.2%) chose *frequently*, 30 of the 90 respondents (33.3%) chose *usually*, 15 of the 90 respondents (16.7%) chose *sometimes*, 5 of the 90 respondents (5.6%) chose *always*, 2 of the 90 respondents (2.2%) chose *rarely*, 1 of the 90 respondents (1.1%) chose *never*, and 1 of the 91 participants who answered the survey did not answer this question.

Table 16

Descriptive Statistics for Criminal Case History as Information Source (Q. 50.4)

Criminal Case History				
	Frequency	Percent	Valid Percent	Cumulative Percent
Always	27	29.7	30.0	30.0
Usually	27	29.7	30.0	60.0
Valid Frequently	23	25.3	25.6	85.6
Sometimes	13	14.3	14.4	100.0
Total	90	98.9	100.0	
Total	91	100.0		

As can be seen from frequency table 16, which correspond to question number 50.4, “Criminal Case History,” 27 of the 90 respondents (30.0%) chose *always*, 27 of the 90 respondents (30.0%) chose *usually*, 23 of the 90 respondents (25.6%) chose *frequently*, 13 of the 90 respondents (14.4%) chose *sometimes*, 1 of the 91 participants who answered the survey did not answer this question.

Table 17

Descriptive Statistics for Technical Surveillance as Information Source (Q. 50.5)

Technical surveillance				
	Frequency	Percent	Valid Percent	Cumulative Percent
Always	11	12.1	12.5	12.5
Usually	23	25.3	26.1	38.6
Valid Frequently	32	35.2	36.4	75.0
Sometimes	17	18.7	19.3	94.3
Rarely	5	5.5	5.7	100.0
Total	88	96.7	100.0	
Total	91	100.0		

As can be seen from frequency table 17, which correspond to question number 50.5, “Technical surveillance,” 32 of the 88 respondents (36.4%) chose *frequently*, 23 of the 88 respondents (26.1%) chose *usually*, 17 of the 88 respondents (19.3%) chose *sometimes*, 11 of the 88 respondents (12.5%) chose *always*, 5 of the 88 respondents (5.7%) chose *rarely*, and 1 of the 91 participants who answered the survey did not answer this question.

Table 18

Descriptive Statistics for Other Agencies as Information Sources (Q. 50.6)

Other agencies		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Always	7	7.7	7.8	7.8
	Usually	16	17.6	17.8	25.6
	Frequently	39	42.9	43.3	68.9
	Sometimes	24	26.4	26.7	95.6
	Rarely	4	4.4	4.4	100.0
	Total	90	98.9	100.0	
Total		91	100.0		

As can be seen from the frequency table 18, which corresponds to question number 50.6, “Other agencies,” 39 of the 90 respondents (43.3%) chose *frequently*, 24 of the 90 respondents (26.7%) chose *sometimes*, 16 of the 90 respondents (17.8%) chose *usually*, 7 of the 90 respondents (7.8%) chose *always*, 4 of the 90 respondents (4.4%) chose *rarely*, and 1 of the 91 participants who answered the survey did not answer this question.

Table 19

Descriptive Statistics for Media as Information Source (Q. 50.7)

Media				
	Frequency	Percent	Valid Percent	Cumulative Percent
Usually	1	1.1	1.1	1.1
Frequently	9	9.9	10.1	11.2
Sometimes	19	20.9	21.3	32.6
Valid Rarely	33	36.3	37.1	69.7
Never	26	28.6	29.2	98.9
Unsure	1	1.1	1.1	100.0
Total	89	97.8	100.0	
Total	91	100.0		

As can be seen from frequency table 19, which corresponds to question number 50.7, “Media,” 33 of the 89 respondents (37.1%) chose *rarely*, 26 of the 89 respondents (29.2%) chose *never*, 9 of the 89 respondents (10.1%) chose *frequently*, 1 of the 90 respondents (1.1%) chose *usually*, 1 of the 89 respondents (1.1%) chose *unsure*, and 2 of the 91 participants who answered the survey did not answer this question.

Table 20

Descriptive Statistics for Public Records as Information Source (Q. 50.8)

Public records				
	Frequency	Percent	Valid Percent	Cumulative Percent
Always	9	9.9	10.0	10.0
Usually	23	25.3	25.6	35.6
Frequently	24	26.4	26.7	62.2
Valid Sometimes	22	24.2	24.4	86.7
Rarely	9	9.9	10.0	96.7
Never	3	3.3	3.3	100.0
Total	90	98.9	100.0	
Total	91	100.0		

As can be seen from frequency table 20, which corresponds to question number 50.8, “Public records,” 24 of the 90 respondents (26.7%) chose *frequently*, 23 of the 90 respondents (25.6%) chose usually, 22 of the 90 respondents (24.4%) chose *sometimes*, 9 of the 90 respondents (10.0%) chose *always*, 9 of the 90 respondents (10.0%) chose *rarely*, 3 of the 90 respondents (3.3%) chose *never*, and 1 of the 91 participants who answered the survey did not answer this question.

Table 21

Descriptive Statistics for Departmental Records as Information Source (Q. 50.9)

Departmental records				
	Frequency	Percent	Valid Percent	Cumulative Percent
Always	25	27.5	27.8	27.8
Usually	24	26.4	26.7	54.4
Frequently	30	33.0	33.3	87.8
Valid Sometimes	8	8.8	8.9	96.7
Rarely	2	2.2	2.2	98.9
Never	1	1.1	1.1	100.0
Total	90	98.9	100.0	
Total	91	100.0		

As can be seen from frequency table 21, which corresponds to question number 50.9, “Departmental records,” 30 of the 90 respondents (33.3%) chose *frequently*, 25 of *usually*, 8 of the 90 respondents (8.9%) chose *sometimes*, 2 of the 90 respondents (2.2%) chose *rarely*, 1 of the 90 respondents (1.1%) chose *never*, and 1 of the 91 participants who answered the survey did not answer this question.

Table 22

Descriptive Statistics for Governmental Records as Information Source (Q. 50.10)

Governmental records				
	Frequency	Percent	Valid Percent	Cumulative Percent
Always	17	18.7	19.8	19.8
Usually	23	25.3	26.7	46.5
Frequently	29	31.9	33.7	80.2
Valid Sometimes	12	13.2	14.0	94.2
Rarely	2	2.2	2.3	96.5
Never	3	3.3	3.5	100.0
Total	86	94.5	100.0	
Total	91	100.0		

As can be seen from frequency table 22, which corresponds to question number 50.10, “Governmental records,” 29 of the 86 respondents (33.3%) chose *frequently*, 23 of the 86 respondents (26.7%) chose *usually*, 17 of the 86 respondents (19.8%) chose *always*, 12 of the 90 respondents (14.0%) chose *sometimes*, 3 of the 86 respondents (3.5%) chose *never*, 2 of the 86 respondents (2.3%) chose *rarely*, and 5 of the 91 participants who answered the survey did not answer this question.

Table 23

Descriptive Statistics for Other Undercover Police Officers as Information Source (Q. 51.1)

Other undercover police officers				
	Frequency	Percent	Valid Percent	Cumulative Percent
Always	22	24.2	24.7	24.7
Usually	52	57.1	58.4	83.1
Valid Frequently	13	14.3	14.6	97.8
Sometimes	1	1.1	1.1	98.9
Never	1	1.1	1.1	100.0
Total	89	97.8	100.0	
Total	91	100.0		

As can be seen from frequency table 23, which corresponds to question number 51.1, “Other undercover police officers,” 52 of the 89 respondents (58.4%) chose usually, 22 of the 89 respondents (24.7%) chose *always*, 13 of the 89 respondents (14.6%) chose *frequently*, 1 of the 89 respondents (1.1%) chose *sometimes*, 1 of the 89 respondents (1.1%) chose *never*, and 5 of the 91 participants who answered the survey did not answer this question.

Table 24

Descriptive Statistics for Departmental Investigations as Information Source (Q. 51.2)

Departmental investigations		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Always	15	16.5	16.7	16.7
	Usually	50	54.9	55.6	72.2
	Frequently	19	20.9	21.1	93.3
	Sometimes	5	5.5	5.6	98.9
	Never	1	1.1	1.1	100.0
	Total	90	98.9	100.0	
Total		91	100.0		

As can be seen from frequency table 24, which corresponds to question number 51.2, “Departmental investigations,” 50 of the 90 respondents (55.6%) chose *usually*, 19 of the 90 respondents (21.1%) chose *frequently*, 15 of the 90 respondents (16.7%) chose *always*, 5 of the 90 respondents (5.6%) chose *sometimes*, 1 of the 90 respondents (1.1%) chose *never*, and 5 of the 91 participants who answered the survey did not answer this question.

Table 25

Descriptive Statistics for Informants as Information Source (Q. 51.3)

Informants		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Usually	15	16.5	16.9	16.9
	Frequently	29	31.9	32.6	49.4
	Sometimes	41	45.1	46.1	95.5
	Rarely	2	2.2	2.2	97.8
	Never	2	2.2	2.2	100.0
	Total	89	97.8	100.0	
Total		91	100.0		

As can be seen from frequency table 25, which corresponds to question number 51.3, “Informants,” 41 of the 89 respondents (46.1%) chose *sometimes*, 29 of the 89 respondents (32.6%) chose *frequently*, 15 of the 89 respondents (16.9%) chose *always*, 2 of the 89 respondents (2.2%) chose *rarely*, 2 of the 89 respondents (2.2%) chose *never*, and 2 of the 91 participants who answered the survey did not answer this question.

Table 26

Descriptive Statistics for Criminal Case History as Information Source (Q. 51.4)

Criminal Case History		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Always	17	18.7	18.9	18.9
	Usually	43	47.3	47.8	66.7
	Frequently	24	26.4	26.7	93.3
	Sometimes	4	4.4	4.4	97.8
	Never	1	1.1	1.1	98.9
	Unsure	1	1.1	1.1	100.0
	Total	90	98.9	100.0	
Total		91	100.0		

As can be seen from frequency table 26, which corresponds to question number 51.4 “Criminal Case History,” 43 of the 90 respondents (47.8%) chose *usually*, 24 of the 90 respondents (26.7%) chose *frequently*, 17 of the 90 respondents (18.9%) chose *always*, 4 of the 90 respondents (4.4%) chose *sometimes*, 1 of the 90 respondents (1.1%) chose *rarely*, 1 of the 90 respondents (1.1%) chose *never*, and 1 of the 91 participants who answered the survey did not answer this question.

Table 27

Descriptive Statistics for Technical Surveillance as Information Source (Q. 51.5)

Technical surveillance				
	Frequency	Percent Valid	Percent	Cumulative Percent
Valid Always	15	16.5	16.7	16.7
Usually	47	51.6	52.2	68.9
Frequently	17	18.7	18.9	87.8
Sometimes	8	8.8	8.9	96.7
Rarely	1	1.1	1.1	97.8
Never	1	1.1	1.1	98.9
Unsure	1	1.1	1.1	100.0
Total	90	98.9	100.0	
Total	91	100.0		

As can be seen from frequency table 27, which corresponds to question number 51.5 “Technical surveillance,” 47 of the 90 respondents (52.2%) chose *usually*, 17 of the 90 respondents (18.9%) chose *frequently*, 15 of the 90 respondents (16.7%) chose *always*, 8 of the 90 respondents (8.9%) chose *sometimes*, 1 of the 90 respondents (1.1%) chose *rarely*, 1 of the 90 respondents (1.1%) chose *never*, 1 of the 90 respondents (1.1%) chose *unsure*, and 1 of the 91 participants who answered the survey did not answer this question.

Table 28

Descriptive Statistics for Other Agencies as Information Source (Q. 51.6)

Other agencies				
	Frequency	Percent	Valid Percent	Cumulative Percent
Always	5	5.5	5.6	5.6
Usually	39	42.9	43.8	49.4
Frequently	34	37.4	38.2	87.6
Valid Sometimes	8	8.8	9.0	96.6
Rarely	2	2.2	2.2	98.9
Never	1	1.1	1.1	100.0
Total	89	97.8	100.0	
Total	91	100.0		

As can be seen from frequency table 28, which corresponds to question number 51.6 “Other agencies,” 39 of the 89 respondents (43.8%) chose *usually*, 34 of the 89 respondents (38.2%) chose *frequently*, 8 of the 89 respondents (9.0%) chose *sometimes*, 5 of the 89 respondents (5.6%) chose *always*, 2 of the 89 respondents (2.2%) chose *rarely*, 1 of the 89 respondents (1.1%) chose *never*, and 2 of the 91 participants who answered the survey did not answer this question.

Table 29

Descriptive Statistics for Media as Information Source (Q. 51.7)

Media				
	Frequency	Percent	Valid Percent	Cumulative Percent
Usually	1	1.1	1.1	1.1
Frequently	3	3.3	3.3	4.4
Sometimes	31	34.1	34.4	38.9
Valid Rarely	28	30.8	31.1	70.0
Never	24	26.4	26.7	96.7
Unsure	3	3.3	3.3	100.0
Total	90	98.9	100.0	
Total	91	100.0		

As can be seen from frequency table 29, which corresponds to question number 51.7 “Media,” 31 of the 90 respondents (34.4%) chose *sometimes*, 28 of the 90 respondents (31.1%) chose *rarely*, 24 of the 90 respondents (26.7%) chose *never*, 3 of the 90 respondents (3.3%) chose *frequently*, 3 of the 90 respondents (3.3%) chose *unsure*, 1 of the 90 respondents (1.1%) chose *always*, and 1 of the 91 participants who answered the survey did not answer this question.

Table 30

Descriptive Statistics for Public Records as Information Source (Q. 51.8)

Public records		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Always	7	7.7	7.8	7.8
	Usually	34	37.4	37.8	45.6
	Frequently	23	25.3	25.6	71.1
	Sometimes	19	20.9	21.1	92.2
	Rarely	3	3.3	3.3	95.6
	Never	1	1.1	1.1	96.7
	Unsure	3	3.3	3.3	100.0
	Total	90	98.9	100.0	
Total		91	100.0		

As can be seen from frequency table 30, which corresponds to question number 51.8 “Public records,” 34 of the 90 respondents (37.8%) chose *usually*, 23 of the 90 respondents (25.6%) chose *frequently*, 19 of the 90 respondents (21.1%) chose *sometimes*, 7 of the 90 respondents (7.8%) chose *always*, 3 of the 90 respondents (3.3%) chose *rarely*, 3 of the 90 respondents (3.3%) chose *unsure*, 1 of the 90 respondents (1.1%) chose *never*, and 1 of the 91 participants who answered the survey did not answer this question.

Table 31

Descriptive Statistics for Departmental Records as Information Source (Q. 51.9)

Departmental records		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Always	15	16.5	16.9	16.9
	Usually	45	49.5	50.6	67.4
	Frequently	18	19.8	20.2	87.6
	Sometimes	10	11.0	11.2	98.9
	Rarely	1	1.1	1.1	100.0
	Total	89	97.8	100.0	
Total		91	100.0		

As can be seen from frequency table 31, which corresponds to question number 51.9 “Departmental records,” 45 of the 89 respondents (50.8%) chose *usually*, 18 of the 89 respondents (20.2%) chose *frequently*, 15 of the 89 respondents (16.9%) chose *always*, 10 of the 89 respondents (11.2%) chose *sometimes*, 1 of the 89 respondents (1.1%) chose *rarely*, and 2 of the 91 participants who answered the survey did not answer this question.

Table 32

Descriptive Statistics for Governmental Records as Information Source (Q. 51.10)

Governmental records		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Always	14	15.4	15.9	15.9
	Usually	40	44.0	45.5	61.4
	Frequently	18	19.8	20.5	81.8
	Sometimes	11	12.1	12.5	94.3
	Rarely	2	2.2	2.3	96.6
	Never	2	2.2	2.3	98.9
	Unsure	1	1.1	1.1	100.0
	Total	88	96.7	100.0	
Total		91	100.0		

As can be seen from frequency table 32, which corresponds to question number 51.10 “Governmental records,” 40 of the 88 respondents (45.5%) chose *usually*, 18 of the 88 respondents (20.5%) chose *frequently*, 14 of the 88 respondents (15.9%) chose *always*, 11 of the 88 respondents (12.5%) chose *sometimes*, 2 of the 88 respondents (2.3%) chose *rarely*, 2 of the 88 respondents (2.3%) chose *never*, and 3 of the 91 participants who answered the survey did not answer this question.

*The Analysis of Descriptive Statistics of Information Sources
for the Transformation Stage Indicators*

Tables 13-32 indicate that media are the least and criminal case history is the most prevalent information source used by the subjects on average. Subjects usually prefer using internal information sources – such as criminal case history, departmental records, peers, and departmental investigations – rather than external information sources, such as other agencies, media, and public records. This may also be related to the credibility issue. For example, media and other agencies’ records and public records may not be as credible as departmental records as information sources for undercover police work. Table 33 summarizes these findings.

Table 33

Summary of Descriptive Statistics for Information Sources

Question Group	Question Number	Mode	Validation Percentages (%)	Corresponding Items in the SVI Model	Corresponding Stage of the SVI Model
	50.1	U-Other undercovers	96.7 (A/U/F/S)		
	50.2	F –Depart inves	97.8 (A/U/F/S)		
	50.3	F-Informants	97.8 (A/U/F/S)		
	50.4	A-Criminal case his	100 (A/U/F/S)		
	50.5	F-Tech surveillance	94.3 (A/U/F/S)		
	50.6	F- Other agencies	95.6 (A/U/F/S)		
	50.7	R – Media	32.6 (U/F/S)		
	50.8	F- Public records	86.7 (A/U/F/S)		
	50.9	F- Dept records	96.7 (A/U/F/S)		
Information Sources (20)	50.10	F-Gov records	94.2 (A/U/F/S)	Sources	Transformation Stage
	51.1	U-Other undercovers	98.9 (A/U/F/S)		
	51.2	U-Depart inves	98.9 (A/U/F/S)		
	51.3	S – Informants	95.5 (U/F/S)		
	51.4	U-Criminal case his	97.8 (A/U/F/S)		
	51.5	U-Tech surveillance	96.7 (A/U/F/S)		
	51.6	U-Other agencies	96.6 (A/U/F/S)		
	51.7-	S – Media	38.9 (U/F/S)		
	51.8	U-Public records	92.2 (A/U/F/S)		
	51.9	U-Dept records	98.9 (A/U/F/S)		
	51.10	U-Gov records	94.3 (A/U/F/S)		

Information Noises

Table 34

Descriptive Statistics for Laws as Information Noise

Laws		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Always	1	1.1	1.1	1.1
	Usually	7	7.7	7.7	8.8
	Frequently	13	14.3	14.3	23.1
	Sometimes	40	44.0	44.0	67.0
	Rarely	21	23.1	23.1	90.1
	Never	8	8.8	8.8	98.9
	Unsure	1	1.1	1.1	100.0
	Total	91	100.0	100.0	

As can be seen from frequency table 34, which corresponds to question number 53.1 “Laws,” 40 of the 91 respondents (44.0%) chose *sometimes*, 21 of the 91 respondents (23.1%) chose *rarely*, 13 of the 91 respondents (14.3%) chose *frequently*, 8 of the 91 respondents (8.8%) chose *never*, 7 of the 91 respondents (7.7%) chose *usually*, 1 of the 91 respondents (1.1%) chose *unsure*, 1 of the 91 respondents (1.1%) chose *always*.

Table 35

Descriptive Statistics for Regulations as Information Noise

Regulations		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Always	1	1.1	1.1	1.1
	Usually	7	7.7	7.7	8.8
	Frequently	13	14.3	14.3	23.1
	Sometimes	49	53.8	53.8	76.9
	Rarely	17	18.7	18.7	95.6
	Never	3	3.3	3.3	98.9
	Unsure	1	1.1	1.1	100.0
	Total	91	100.0	100.0	

As can be seen from frequency table 35, which corresponds to question number 53.2 “Regulations,” 49 of the 91 respondents (53.8%) chose *sometimes*, 17 of the 91 respondents (18.7%) chose *rarely*, 13 of the 91 respondents (14.3%) chose *frequently*, 8 of the 91 respondents (8.8%) chose *never*, 7 of the 91 respondents (7.7%) chose *usually*, 1 of the 91 respondents (1.1%) chose *never*, 1 of the 91 respondents (1.1%) chose *unsure*, 1 of the 91 respondents (1.1%) chose *always*.

Table 36

Descriptive Statistics for Other Officers as Information Noise

Other officers				
	Frequency	Percent	Valid Percent	Cumulative Percent
Usually	1	1.1	1.1	1.1
Frequently	7	7.7	7.7	8.8
Sometimes	44	48.4	48.4	57.1
Valid Rarely	30	33.0	33.0	90.1
Never	8	8.8	8.8	98.9
Unsure	1	1.1	1.1	100.0
Total	91	100.0	100.0	

As can be seen from frequency table 36, which corresponds to question number 53.3 “Other officers,” 44 of the 91 respondents (48.4%) chose *sometimes*, 30 of the 91 respondents (33.0%) chose *rarely*, 8 of the 91 respondents (8.8%) chose *never*, 7 of the 91 respondents (7.7%) chose *frequently*, 1 of the 91 respondents (1.1%) chose *usually*, and 1 of the 91 respondents (1.1%) chose *unsure*.

Table 37

Descriptive Statistics for Bureaucracy as Information Noise

Bureaucracy		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Always	3	3.3	3.3	3.3
	Usually	14	15.4	15.4	18.7
	Frequently	29	31.9	31.9	50.5
	Sometimes	33	36.3	36.3	86.8
	Rarely	9	9.9	9.9	96.7
	Never	1	1.1	1.1	97.8
	Unsure	2	2.2	2.2	100.0
	Total	91	100.0	100.0	

As can be seen from frequency table 37, which corresponds to question number 53.4 “Bureaucracy,” 33 of the 91 respondents (36.3%) chose *sometimes*, 29 of the 91 respondents (31.9%) chose *frequently*, 14 of the 91 respondents (15.4%) chose *usually*, 9 of the 91 respondents (9.9%) chose *rarely*, 3 of the 91 respondents (3.3%) chose *always*, 2 of the 91 respondents (2.2%) chose *unsure*, and 1 of the 91 respondents (1.1%) chose *never*.

Table 38

Descriptive Statistics for Politicians as Information Noise

Politicians		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Always	4	4.4	4.4	4.4
	Usually	9	9.9	9.9	14.3
	Frequently	16	17.6	17.6	31.9
	Sometimes	28	30.8	30.8	62.6
	Rarely	17	18.7	18.7	81.3
	Never	9	9.9	9.9	91.2
	Unsure	8	8.8	8.8	100.0
	Total	91	100.0	100.0	

As can be seen from frequency table 38, which corresponds to question number 53.5 “Politicians,” 28 of the 91 respondents (30.8%) chose *sometimes*, 17 of the 91 respondents (18.7%) chose *rarely*, 16 of the 91 respondents (17.6%) chose *frequently*, 9 of the 91 respondents (9.9%) chose *usually*, 9 of the 91 respondents (9.9%) chose *never*, 8 of the 91 respondents (8.8%) chose *unsure*, and 4 of the 91 respondents (4.4%) chose *always*.

Table 39

Descriptive Statistics for Police Review Board as Information Noise

Police review board		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Always	2	2.2	2.2	2.2
	Usually	2	2.2	2.2	4.4
	Frequently	6	6.6	6.6	11.0
	Sometimes	23	25.3	25.3	36.3
	Rarely	21	23.1	23.1	59.3
	Never	22	24.2	24.2	83.5
	Unsure	15	16.5	16.5	100.0
	Total	91	100.0	100.0	

As can be seen from frequency table 39, which corresponds to question number 53.6 “Police review board,” 23 of the 91 respondents (25.3%) chose *sometimes*, 22 of the 91 respondents (24.2%) chose *never*, 21 of the 91 respondents (23.1%) chose *rarely*, 15 of the 91 respondents (16.5%) chose *unsure*, 6 of the 91 respondents (6.6%) chose *frequently*, 2 of the 91 respondents (2.2%) chose *usually*, and 2 of the 91 respondents (2.2%) chose *always*.

Table 40

Descriptive Statistics for Bad Guys as Information Noise

Bad guys				
	Frequency	Percent	Valid Percent	Cumulative Percent
Always	3	3.3	3.3	3.3
Usually	15	16.5	16.5	19.8
Frequently	29	31.9	31.9	51.6
Valid Sometimes	35	38.5	38.5	90.1
Rarely	8	8.8	8.8	98.9
Never	1	1.1	1.1	100.0
Total	91	100.0	100.0	

As can be seen from frequency table 40, which corresponds to question number 53.7 “Bad guys,” 35 of the 91 respondents (38.5%) chose *sometimes*, 29 of the 91 respondents (31.9%) chose *frequently*, 15 of the 91 respondents (16.5%) chose *usually*, 8 of the 91 respondents (8.8%) chose *rarely*, 3 of the 91 respondents (3.3%) chose *always*, and 1 of the 91 respondents (1.1%) chose *never*.

Table 41

Descriptive Statistics for Informants as Information Noise

Informants				
	Frequency	Percent	Valid Percent	Cumulative Percent
Usually	1	1.1	1.1	1.1
Frequently	19	20.9	20.9	22.0
Sometimes	58	63.7	63.7	85.7
Valid Rarely	10	11.0	11.0	96.7
Never	1	1.1	1.1	97.8
Unsure	2	2.2	2.2	100.0
Total	91	100.0	100.0	

As can be seen from frequency table 41, which corresponds to question number 53.8 “Informants,” 58 of the 91 respondents (63.7%) chose *sometimes*, 19 of the 91 respondents

(20.9%) chose *frequently*, 10 of the 91 respondents (11.0%) chose *rarely*, 2 of the 91 respondents (2.2%) chose *unsure*, 1 of the 91 respondents (1.1%) chose *never*, and 1 of the 91 respondents (1.1%) chose *usually*.

Table 42

Descriptive Statistics for Police Family as Information Noise

Police family		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Always	1	1.1	1.1	1.1
	Usually	1	1.1	1.1	2.2
	Frequently	8	8.8	8.8	11.0
	Sometimes	19	20.9	20.9	31.9
	Rarely	38	41.8	41.8	73.6
	Never	16	17.6	17.6	91.2
	Unsure	8	8.8	8.8	100.0
	Total	91	100.0	100.0	

As can be seen from frequency table 42, which corresponds to question number 53.9 “Police family,” 38 of the 91 respondents (41.8%) chose *rarely*, 19 of the 91 respondents (20.9%) chose *sometimes*, 16 of the 91 respondents (17.6%) chose *never*, 8 of the 91 respondents (8.8%) chose *frequently*, 8 of the 91 respondents (8.8%) chose *unsure*, 1 of the 91 respondents (1.1%) chose *always*, and 1 of the 91 respondents (1.1%) chose *usually*.

Table 43

Descriptive Statistics for Supervisory Officers as Information Noise

Supervisory officers		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Always	2	2.2	2.2	2.2
	Frequently	12	13.2	13.2	15.4
	Sometimes	34	37.4	37.4	52.7
	Rarely	38	41.8	41.8	94.5
	Never	4	4.4	4.4	98.9
	Unsure	1	1.1	1.1	100.0
	Total	91	100.0	100.0	

As can be seen from frequency table 43, which corresponds to question number 53.10 “Supervisory officers,” 38 of the 91 respondents (41.8%) chose rarely, 34 of the 91 respondents (37.4%) chose *sometimes*, 12 of the 91 respondents (13.2%) chose *frequently*, 4 of the 91 respondents (4.4%) chose *never*, 2 of the 91 respondents (2.2%) chose *always*, and 1 of the 91 respondents (1.1%) chose *unsure*.

Table 44

Descriptive Statistics for the Bad Guys’ Families as Information Noise

Bad guy's family		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Always	1	1.1	1.1	1.1
	Usually	11	12.1	12.1	13.2
	Frequently	20	22.0	22.0	35.2
	Sometimes	32	35.2	35.2	70.3
	Rarely	14	15.4	15.4	85.7
	Never	8	8.8	8.8	94.5
	Unsure	5	5.5	5.5	100.0
	Total	91	100.0	100.0	

As can be seen from frequency table 44, which corresponds to question number 53.11 “Bad guy’s family,” 32 of the 91 respondents (35.2%) chose *sometimes*, 20 of the 91 respondents (22.0%) chose *frequently*, 14 of the 91 respondents (15.4%) chose *rarely*, 11 of the 91 respondents (12.1%) chose *usually*, 8 of the 91 respondents (8.8%) chose *never*, 5 of the 91 respondents (5.5%) chose *unsure*, and 1 of the 91 respondents (1.1%) chose *always*.

Table 45

Descriptive Statistics for the Structure of the Department as Information Noise

Structure of the department				
	Frequency	Percent	Valid Percent	Cumulative Percent
Usually	3	3.3	3.3	3.3
Frequently	13	14.3	14.3	17.6
Sometimes	40	44.0	44.0	61.5
Valid Rarely	28	30.8	30.8	92.3
Never	5	5.5	5.5	97.8
Unsure	2	2.2	2.2	100.0
Total	91	100.0	100.0	

As can be seen from frequency table 45, which corresponds to question number 53.12 “Structure of the department,” 40 of the 91 respondents (44.0%) chose *sometimes*, 28 of the 91 respondents (30.8%) chose *rarely*, 13 of the 91 respondents (14.3%) chose *frequently*, 5 of the 91 respondents (5.5%) chose *never*, 3 of the 91 respondents (3.3%) chose *usually*, and 2 of the 91 respondents (2.2%) chose *unsure*.

Table 46

Descriptive Statistics for Personal Stress Level as Information Noise

Personal stress level				
	Frequency	Percent	Valid Percent	Cumulative Percent
Usually	1	1.1	1.1	1.1
Frequently	6	6.6	6.6	7.7
Sometimes	41	45.1	45.1	52.7
Valid Rarely	32	35.2	35.2	87.9
Never	6	6.6	6.6	94.5
Unsure	5	5.5	5.5	100.0
Total	91	100.0	100.0	

As can be seen from frequency table 46, which corresponds to question number 53.13 “Personal stress level,” 41 of the 91 respondents (45.1%) chose *sometimes*, 32 of the 91 respondents (35.2%) chose *rarely*, 6 of the 91 respondents (6.6%) chose *frequently*, 6 of the 91 respondents (6.6%) chose *never*, 5 of the 91 respondents (5.5%) chose *unsure*, and 1 of the 91 respondents (1.1%) chose *usually*.

Table 47

Descriptive Statistics for the Chain of Command as Information Noise

Chain of command		Frequency	Percent Valid	Percent Cumulative	Percent
Valid	Always	1	1.1	1.1	1.1
	Usually	3	3.3	3.3	4.4
	Frequently	14	15.4	15.6	20.0
	Sometimes	47	51.6	52.2	72.2
	Rarely	21	23.1	23.3	95.6
	Never	3	3.3	3.3	98.9
	Unsure	1	1.1	1.1	100.0
	Total	90	98.9	100.0	
Missing System	1	1.1			
Total	91	100.0			

As can be seen from frequency table 47, which corresponds to question number 53.14, “Chain of command,” 47 of the 90 respondents (52.2%) chose *sometimes*, 21 of the 90 respondents (23.3%) chose *rarely*, 14 of the 90 respondents (15.6%) chose *frequently*, 3 of the 90 respondents (3.3%) chose *usually*, 3 of the 90 respondents (3.3%) chose *never*, 1 of the 90 respondents (1.1%) chose *always*, 1 of the 90 respondents (1.1%) chose *unsure*, and 1 of the 91 participants who answered the survey did not answer this question.

Table 48

Descriptive Statistics for Inconsistent Communication as Information Noise

Inconsistent communication				
	Frequency	Percent	Valid Percent	Cumulative Percent
Always	2	2.2	2.2	2.2
Usually	4	4.4	4.4	6.6
Frequently	15	16.5	16.5	23.1
Valid Sometimes	55	60.4	60.4	83.5
Rarely	13	14.3	14.3	97.8
Unsure	2	2.2	2.2	100.0
Total	91	100.0	100.0	

As can be seen from frequency table 48, which corresponds to question number 53.15 “Inconsistent communication,” 55 of the 91 respondents (60.4%) chose *sometimes*, 15 of the 91 respondents (16.5%) chose *frequently*, 13 of the 91 respondents (14.3%) chose *rarely*, 4 of the 91 respondents (4.4%) chose *usually*, 2 of the 91 respondents (2.2%) chose *unsure*.

Table 49

Descriptive Statistics for Personal Safety as Information Noise

Personal Safety				
	Frequency	Percent	Valid Percent	Cumulative Percent
Usually	4	4.4	4.4	4.4
Frequently	7	7.7	7.7	12.1
Sometimes	49	53.8	53.8	65.9
Valid Rarely	20	22.0	22.0	87.9
Never	8	8.8	8.8	96.7
Unsure	3	3.3	3.3	100.0
Total	91	100.0	100.0	

As can be seen from frequency table 49, which corresponds to question number 53.16 “Personal Safety,” 49 of the 91 respondents (53.8%) chose *sometimes*, 20 of the 91 respondents

(22.0%) chose *rarely*, 8 of the 91 respondents (8.8%) chose *never*, 7 of the 91 respondents (7.7%) chose *frequently*, 4 of the 91 respondents (4.4%) chose *usually*, and 3 of the 91 respondents (3.3%) chose *unsure*.

Table 50

Descriptive Statistics for Work Overload as Information Noise

Work overload		Frequency	Percent Valid	Percent	Cumulative Percent
Valid	Always	2	2.2	2.2	2.2
	Usually	10	11.0	11.1	13.3
	Frequently	22	24.2	24.4	37.8
	Sometimes	37	40.7	41.1	78.9
	Rarely	14	15.4	15.6	94.4
	Never	4	4.4	4.4	98.9
	Unsure	1	1.1	1.1	100.0
	Total	90	98.9	100.0	
Total		91	100.0		

As can be seen from frequency table 50, which corresponds to question number 53.17, “Work overload,” 37 of the 90 respondents (41.1%) chose *sometimes*, 22 of the 90 respondents (24.4%) chose *frequently*, 14 of the 90 respondents (15.6%) chose *rarely*, 10 of the 90 respondents (11.1%) chose *usually*, 4 of the 90 respondents (4.4%) chose *never*, 2 of the 90 respondents (2.2%) chose *always*, 1 of the 90 respondents (1.1%) chose *unsure*, and 1 of the 91 participants who answered the survey did not answer this question.

*The Analysis of Descriptive Statistics of Information Noises
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Tables 34-50 indicate that bad-guys are the most, and police review boards are the least influential factors constituting information noises. On the other hand, the importance of each of

the information noises is quite close to each other. In other words, there is no great dispersion between the influences of information noises on the information processing system of the subjects of this study on average. Table 51 summarizes these findings.

Table 51

Summary of Information Noise

Question Group	Question Number	Mode	Validation Percentages (%)	Corresponding Items in the SVI Model	Corresponding Stage of the SVI Model
Information Noises (17)	53.1	S-Laws	67.0 (A/U/F/S)	Noise	Transformation Stage
	53.2	S-Regulations	76.9 (A/U/F/S)		
	53.3	S-Other officers	57.1 (U/F/S)		
	53.4	S-Bureaucracy	86.8 (A/U/F/S)		
	53.5	S-Politicians	62.6 (A/U/F/S)		
	53.6	S-Police review board	36.3 (A/U/F/S)		
	53.7	S-Bad guys	90.1 (A/U/F/S)		
	53.8	S-Informants	85.7 (U/F/S)		
	53.9	R-Police family	31.9 (A/U/F/S)		
	53.10	R-Supervisory office	52.7 (A/F/S)		
	53.11	S-Bad guy's family	70.3 (A/U/F/S)		
	53.12	S-Structure of dept	61.5 (U/F/S)		
	53.13	S-Personal stress lev	52.7 (U/F/S)		
	53.14	S-Chain of command	72.2 (A/U/F/S)		
	53.15	S-inconsistent comm.	83.5 (A/U/F/S)		
	53.16	S-Personal safety	65.9 (U/F/S)		
	53.17	S-Work overload	78.9 (A/U/F/S)		

Table 52

Descriptive Statistics for Variables in Chatman’s Theory, Q. 11

		Frequency	Percent	Valid Percent	Cumulative Percent
Undercover police have strong attitudes and beliefs about the significance of their job					
Valid	Strongly Agree	51	56.0	58.0	58.0
	Agree	34	37.4	38.6	96.6
	Mildly Agree	3	3.3	3.4	100.0
	Total	88	96.7	100.0	
Total		91	100.0		

As can be seen from frequency table 52 for question number 11, which corresponds to “Undercover police have strong attitudes and beliefs about the significance of their job,” 51 of the 88 respondents chose *strongly agree*, which is 58.0% of the overall respondents; 34 of the 88 respondents chose *agree*, which is 38.6% of the overall respondents; 3 of the 88 respondents chose *mildly agree*, which is 3.4% of the overall respondents; and 3 of the 91 participants who answered the survey did not answer this question. The interesting outcome of this question is that every respondent agreed with statement on strong levels.

Table 53

Descriptive Statistics for Variables in Chatman's Theory, Q. 12

Undercover police form their own brotherhood				
	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Agree	24	26.4	27.3	27.3
Agree	38	41.8	43.2	70.5
Mildly Agree	18	19.8	20.5	90.9
Valid Mildly Disagree	4	4.4	4.5	95.5
Disagree	3	3.3	3.4	98.9
Unsure	1	1.1	1.1	100.0
Total	88	96.7	100.0	
Total	91	100.0		

As can be seen from frequency table 53 for question number 12, which corresponds to “Undercover police form their own brotherhood,” 38 of the 88 respondents chose *agree*, which is 43.2% of the overall respondents; 24 of the 88 respondents chose *strongly agree*, which is 27.3% of the overall respondents; 18 of the 88 respondents chose *mildly agree*, which is 20.5% of the overall respondents; 4 of the 88 respondents chose *mildly disagree*, which is 4.5% of the overall respondents; 3 of the 88 respondents chose *disagree*, which is 3.4% of the overall respondents; 1 of the 88 respondents chose *unsure*, which is 1.1% of the overall respondents; and 3 of the 91 participants who answered the survey did not answer this question.

Table 54

Descriptive Statistics for Variables in Chatman's Theory, Q. 13

Undercover police tend to socialize with each other in their spare time				
	Frequency	Percent Valid	Percent	Cumulative Percent
Valid Strongly Agree	10	11.0	11.4	11.4
Agree	30	33.0	34.1	45.5
Mildly Agree	29	31.9	33.0	78.4
Mildly Disagree	12	13.2	13.6	92.0
Disagree	2	2.2	2.3	94.3
Strongly Disagree	2	2.2	2.3	96.6
Unsure	3	3.3	3.4	100.0
Total	88	96.7	100.0	
Total	91	100.0		

As can be seen from frequency table 54 for question number 13, which corresponds to “Undercover police tend to socialize with each other in their spare time,” 30 of the 88 respondents chose *agree*, which is 34.1% of the overall respondents; 29 of the 88 respondents chose *mildly agree*, which is 33.0% of the overall respondents; 12 of the 88 respondents chose *mildly disagree*, which is (%13.6) of the overall respondents; 10 of the 88 respondents chose *strongly agree*, which is 11.4% of the overall respondents; 2 of the 88 respondents chose *disagree*, which is 2.3% of the overall respondents; 2 of the 88 respondents chose *strongly disagree*, which is 2.3% of the overall respondents; 3 of the 88 respondents chose *unsure*, which is 3.4% of the overall respondents; and 3 of the 91 participants who answered the survey did not answer this question.

Table 55

Descriptive Statistics for Variables in Chatman's Theory, Q. 14

Undercover work requires more emphasis on details than other police work				
	Frequency	Percent Valid	Percent	Cumulative Percent
Strongly Agree	30	33.0	34.1	34.1
Agree	27	29.7	30.7	64.8
Mildly Agree	16	17.6	18.2	83.0
Valid Mildly Disagree	5	5.5	5.7	88.6
Disagree	9	9.9	10.2	98.9
Unsure	1	1.1	1.1	100.0
Total	88	96.7	100.0	
Total	91	100.0		

As can be seen from frequency table 55 for question number 14, which corresponds to “Undercover work requires more emphasis on details than other police work,” 30 of the 88 respondents chose *strongly agree*, which is 34.1% of the overall respondents; 27 of the 88 respondents chose *agree*, which is 30.7% of the overall respondents; 16 of the 88 respondents chose *mildly agree*, which is 18.2% of the overall respondents; 9 of the 88 respondents chose *disagree*, which is 10.2% of the overall respondents; 1 of the 88 respondents chose *unsure*, which is 1.1% of the overall respondents; and 3 of the 91 participants who answered the survey did not answer this question.

Table 56

Descriptive Statistics for Variables in Chatman’s Theory, Q.15

Undercover police would prefer to live in a neighborhood where their colleagues live				
	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Agree	3	3.3	3.4	3.4
Agree	12	13.2	13.6	17.0
Mildly Agree	25	27.5	28.4	45.5
Mildly Disagree	16	17.6	18.2	63.6
Disagree	15	16.5	17.0	80.7
Strongly Disagree	5	5.5	5.7	86.4
Unsure	12	13.2	13.6	100.0
Total	88	96.7	100.0	
Total	91	100.0		

As can be seen from frequency table 56 for question number 15, which corresponds to “Undercover police would prefer to live in a neighborhood where their colleagues live,” 25 of the 88 respondents chose *mildly agree*, which is 28.4% of the overall respondents; 16 of the 88 respondents chose *mildly disagree*, which is 18.2% of the overall respondents; 15 of the 88 respondents chose *disagree*, which is 17.0% of the overall respondents; 12 of the 88 respondents chose *agree*, which is 13.6% of the overall respondents; 3 of the 88 respondents chose *strongly agree*, which is 3.4% of the overall respondents, 5 of the 88 respondents chose *strongly disagree*, which is 5.7% of the overall respondents; 12 of the 88 respondents chose *unsure*, which is 13.6% of the overall respondents; and 3 of the 91 participants who answered the survey did not answer this question.

Table 57

Descriptive Statistics for Variables in Chatman's Theory, Q. 16

Undercover police form their own world				
	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Agree	5	5.5	5.7	5.7
Agree	13	14.3	14.9	20.7
Mildly Agree	23	25.3	26.4	47.1
Mildly Disagree	15	16.5	17.2	64.4
Disagree	21	23.1	24.1	88.5
Strongly Disagree	5	5.5	5.7	94.3
Unsure	5	5.5	5.7	100.0
Total	87	95.6	100.0	
Total	91	100.0		

As can be seen from frequency table 57 for question number 16, which corresponds to “Undercover police form their own world,” 23 of the 88 respondents chose *mildly agree*, which is 26.4% of the overall respondents; 21 of the 88 respondents chose *disagree*, which is 24.1% of the overall respondents; 15 of the 88 respondents chose *mildly disagree*, which is 17.2% of the overall respondents; 13 of the 88 respondents chose *agree*, which is 14.9% of the overall respondents; 5 of the 88 respondents chose *strongly agree*, which is 5.7% of the overall respondents; 5 of the 88 respondents chose *strongly disagree*, which is 5.7% of the overall respondents; 5 of the 88 respondents chose *unsure*, which is 5.7% of the overall respondents; and 3 of the 91 participants who answered the survey did not answer this question.

Table 58

Descriptive Statistics for Variables in Chatman's Theory, Q. 17

Undercover teams have a strong sense of unity and belongingness				
	Frequency	Percent Valid	Percent	Cumulative Percent
Strongly Agree	29	31.9	33.0	33.0
Agree	42	46.2	47.7	80.7
Mildly Agree	12	13.2	13.6	94.3
Valid Mildly Disagree	1	1.1	1.1	95.5
Disagree	3	3.3	3.4	98.9
Unsure	1	1.1	1.1	100.0
Total	88	96.7	100.0	
Total	91	100.0		

As can be seen from frequency table 58 for question number 17, which corresponds to “Undercover teams have a strong sense of unity and belongingness,” 42 of the 88 respondents chose *agree*, which is 47.7% of the overall respondents; 29 of the 88 respondents chose *strongly agree*, which is 33.0% of the overall respondents; 12 of the 88 respondents chose *mildly agree*, which is 13.6% of the overall respondents; 3 of the 88 respondents chose *disagree*, which is 3.4% of the overall respondents; 1 of the 88 respondents chose *mildly disagree*, which is 1.1% of the overall respondents; 1 of the 88 respondents chose *unsure*, which is 1.1% of the overall respondents; and 3 of the 91 participants who answered the survey did not answer this question.

Table 59

Descriptive Statistics for Variables in Chatman’s Theory, Q. 18

Undercover work is very different from routine police work				
	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Agree	53	58.2	60.9	60.9
Agree	25	27.5	28.7	89.7
Valid Mildly Agree	6	6.6	6.9	96.6
Mildly Disagree	3	3.3	3.4	100.0
Total	87	95.6	100.0	
Total	91	100.0		

As can be seen from frequency table 59 for question number 18, which corresponds to “Undercover work is very different from routine police work,” 53 of the 87 respondents chose *strongly agree*, which is 60.9% of the overall respondents; 25 of the 87 respondents chose *agree*, which is 28.7% of the overall respondents; 6 of the 87 respondents chose *mildly agree*, which is 6.9% of the overall respondents; 3 of the 87 respondents chose *mildly disagree*, which is 3.4% of the overall respondents; and 3 of the 91 participants who answered the survey did not answer this question.

Table 60

Descriptive Statistics for Variables in Chatman's Theory, Q. 19

Undercover work is just the same as any other police work				
	Frequency	Percent Valid	Percent	Cumulative Percent
Strongly Agree	1	1.1	1.1	1.1
Agree	2	2.2	2.3	3.4
Mildly Agree	2	2.2	2.3	5.7
Valid Mildly Disagree	13	14.3	14.8	20.5
Disagree	31	34.1	35.2	55.7
Strongly Disagree	39	42.9	44.3	100.0
Total	88	96.7	100.0	
Total	91	100.0		

As can be seen from frequency table 60 for question number 19, which corresponds to “Undercover work is just the same as any other police work,” 39 of the 88 respondents chose *strongly disagree*, which is 44.3% of the overall respondents; 31 of the 88 respondents chose *disagree*, which is 35.2% of the overall respondents; 13 of the 88 respondents chose *mildly disagree*, which is 14.8% of the overall respondents; 2 of the 88 respondents chose *mildly agree*, which is 2.3% of the overall respondents; 2 of the 88 respondents chose *agree*, which is 2.3% of the overall respondents; 1 of the 88 respondents chose *strongly agree*, which is 1.1% of the overall respondents; and 3 of the 91 participants who answered the survey did not answer this question.

Table 61

Descriptive Statistics for Variables in Chatman's Theory, Q. 20

Undercover police need to have different approaches than other police				
	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Agree	27	29.7	31.0	31.0
Agree	45	49.5	51.7	82.8
Valid Mildly Agree	12	13.2	13.8	96.6
Mildly Disagree	3	3.3	3.4	100.0
Total	87	95.6	100.0	
Total	91	100.0		

As can be seen from frequency table 61 for question number 20, which corresponds to “Undercover police need to have different approaches than other police,” 45 of the 88 respondents chose *agree*, which is 51.7% of the overall respondents; 27 of the 88 respondents chose *strongly agree*, which is 31.0% of the overall respondents; 12 of the 88 respondents chose *mildly agree*, which is 13.8% of the overall respondents; 3 of the 88 respondents chose *mildly disagree*, which is 3.4% of the overall respondents; and 3 of the 91 participants who answered the survey did not answer this question.

Table 62

Descriptive Statistics for Variables in Chatman's Theory, Q. 21

Undercover police form their own community				
	Frequency	Percent Valid	Percent	Cumulative Percent
Valid Strongly Agree	5	5.5	5.7	5.7
Agree	23	25.3	26.4	32.2
Mildly Agree	22	24.2	25.3	57.5
Mildly Disagree	16	17.6	18.4	75.9
Disagree	13	14.3	14.9	90.8
Strongly Disagree	3	3.3	3.4	94.3
Unsure	5	5.5	5.7	100.0
Total	87	95.6	100.0	
Total	91	100.0		

As can be seen from frequency table 62 for question number 21, which corresponds to “Undercover police form their own community,” 23 of the 87 respondents chose *agree*, which is 26.4% of the overall respondents; 22 of the 87 respondents chose *mildly agree*, which is 25.3% of the overall respondents; 16 of the 87 respondents chose *mildly disagree*, which is 18.4% of the overall respondents; 13 of the 87 respondents chose *disagree*, which is 14.9% of the overall respondents; 5 of the 87 respondents chose *strongly agree*, which is 5.7% of the overall respondents; 3 of the 87 respondents chose *strongly disagree*, which is 3.4% of the overall respondents; 5 of the 87 respondents chose *unsure*, which is 5.7% of the overall respondents; and 4 of the 91 participants who answered the survey did not answer this question.

Table 63

Descriptive Statistics for Variables in Chatman’s Theory, Q. 22

Undercover police need to have a procedures checklist for handling situations				
	Frequency	Percent Valid	Percent	Cumulative Percent
Strongly Agree	18	19.8	20.7	20.7
Agree	30	33.0	34.5	55.2
Mildly Agree	23	25.3	26.4	81.6
Valid Mildly Disagree	8	8.8	9.2	90.8
Disagree	6	6.6	6.9	97.7
Strongly Disagree	2	2.2	2.3	100.0
Total	87	95.6	100.0	
Total	91	100.0		

As can be seen from frequency table 63 for question number 22, which corresponds to “Undercover police need to have a procedures checklist for handling situations,” 30 of the 87 respondents chose *agree*, which is 34.5% of the overall respondents; 23 of the 87 respondents chose *mildly agree*, which is 26.4% of the overall respondents; 18 of the 87 respondents chose *strongly agree*, which is 20.7% of the overall respondents; 8 of the 87 respondents chose *mildly disagree*, which is 9.2% of the overall respondents; 6 of the 87 respondents chose *disagree*, which is 6.9% of the overall respondents; 2 of the 87 respondents chose *strongly disagree*, which is 2.3% of the overall respondents; and 4 of the 91 participants who answered the survey did not answer this question.

The Analysis of Descriptive Statistics of Elfreda Chatman for the Transformation Stage Indicators

Table 52-63 indicate the descriptive statistics related to responses to the questions derived from Elfreda Chatman's Small World Theory in order to test the effect of the credibility in the SVI model. The descriptive statistics indicate that undercover officers exclude themselves from the others. They have a very strong belief and attachment to their job, they like to be different from the other police officers who are not undercover, and they believe that their job is different from other police jobs. In contrast, they don't prefer to live in the same neighborhood with other undercover police officers, and they don't want to form their own world. These results may indicate that they either feel something different, or they psychologically want to be different from other law enforcement personnel while they fear to express this idea directly to others; also this issue was expressed during the interviews. In sum, the descriptive statistics give some clues about the validity and reliability of the Chatman's theory. Table 64 summarizes these findings.

Table 64

Summary of Descriptive Statistics for Variables in Chatman's Theory

<i>Question Group</i>	<i>Question Number</i>	<i>Mode</i>	<i>Validation Percentages (%)</i>	<i>Corresponding Items in the SVI Model</i>	<i>Corresponding Stage of the SVI Model</i>
Chatman theory (12)	11	SA-attitudes, beliefs	100 (SA/A/MA)	Credibility	Transformation Stage
	12	A-brotherhood	90.9 (SA/A/MA)		
	13	A-Socialize with each	78.4 (SA/A/MA)		
	14	SA-Emphasis details	83.0 (SA/A/MA)		
	15	MA-Colleague neigh.	45.5 (SA/A/MA)		
	16	MA-Form own world	47.1 (SA/A/MA)		
	17	A-Belongingness	94.3 (SA/A/MA)		
	18	SA-UC is different	96.6 (SA/A/MA)		
	19	SD-UC is the same	5.7 (SA/A/MA)		
	20	A-Different approach	96.6 (SA/A/MA)		
	21	A-Own community	57.5 (SA/A/MA)		
	22	A-Checklist	81.6 (SA/A/MA)		

Table 65

Descriptive Statistics for Variables in Shannon and Weaver's Theory, Q. 23

I trust an informant				
	Frequency	Percent Valid	Percent	Cumulative Percent
Agree	3	3.3	3.4	3.4
Mildly Agree	16	17.6	18.2	21.6
Mildly Disagree	15	16.5	17.0	38.6
Valid Disagree	23	25.3	26.1	64.8
Strongly Disagree	30	33.0	34.1	98.9
Unsure	1	1.1	1.1	100.0
Total	88	96.7	100.0	
<hr/>				
Total	91	100.0		

As can be seen from frequency table 65 for question number 23, which corresponds to “I trust an informant,” 30 of the 88 respondents chose *strongly disagree*, which is 34.1% of the overall respondents; 23 of the 88 respondents chose *disagree*, which is 26.1% of the overall respondents; 16 of the 88 respondents chose *mildly agree*, which is (% 18.2) of the overall respondents; 15 of the 88 respondents chose *mildly disagree*, which is 17.0% of the overall respondents; 3 of the 88 respondents chose *agree*, which is 3.4% of the overall respondents; 1 of the 88 respondents chose *unsure*, which is 1.1% of the overall respondents; and 3 of the 91 participants who answered the survey did not answer this question.

Table 66

Descriptive Statistics for Variables in Shannon and Weaver's Theory, Q. 24

I trust an informant even when I have no other corroborating evidence				
	Frequency	Percent Valid	Percent	Cumulative Percent
Mildly Agree	6	6.6	6.8	6.8
Mildly Disagree	16	17.6	18.2	25.0
Valid Disagree	27	29.7	30.7	55.7
Strongly Disagree	38	41.8	43.2	98.9
Unsure	1	1.1	1.1	100.0
Total	88	96.7	100.0	
Total	91	100.0		

As can be seen from frequency table 66 for question number 24, which corresponds to “I trust an informant even when I have no other corroborating evidence,” 38 of the 88 respondents chose *strongly disagree*, which is 43.2% of the overall respondents; 27 of the 88 respondents chose *disagree*, which is 30.7% of the overall respondents; 16 of the 88 respondents chose *mildly disagree*, which is 18.2% of the overall respondents; 6 of the 88 respondents chose *mildly agree*, which is 6.8% of the overall respondents; 1 of the 88 respondents chose *unsure*, which is 1.1% of the overall respondents; and 3 of the 91 participants who answered the survey did not answer this question.

Table 67

Descriptive Statistics for Variables in Shannon and Weaver's Theory, Q. 25

I trust an informant when I have a history with the informant				
	Frequency	Percent	Valid Percent	Cumulative Percent
Agree	19	20.9	21.8	21.8
Mildly Agree	33	36.3	37.9	59.8
Mildly Disagree	9	9.9	10.3	70.1
Valid Disagree	12	13.2	13.8	83.9
Strongly Disagree	12	13.2	13.8	97.7
Unsure	2	2.2	2.3	100.0
Total	87	95.6	100.0	
Total	91	100.0		

As can be seen from frequency table 67 for question number 25, which corresponds to “I trust an informant when I have a history with the informant,” 33 of the 87 respondents chose *mildly agree*, which is 37.9% of the overall respondents; 19 of the 87 respondents chose *agree*, which is 21.8% of the overall respondents; 12 of the 87 respondents chose *disagree*, which is 13.8% of the overall respondents; 12 of the 87 respondents chose *strongly disagree*, which is 13.8% of the overall respondents; 9 of the 87 respondents chose *mildly disagree*, which is 10.3% of the overall respondents; 2 of the 87 respondents chose *unsure*, which is (%2.3) of the overall respondents; and 4 of the 91 participants who answered the survey did not answer this question.

Table 68

Descriptive Statistics for Variables in Shannon and Weaver's Theory, Q. 26

I trust an informant when another good source says he or she is dependable				
	Frequency	Percent	Valid Percent	Cumulative Percent
Agree	12	13.2	13.6	13.6
Mildly Agree	30	33.0	34.1	47.7
Mildly Disagree	17	18.7	19.3	67.0
Valid Disagree	12	13.2	13.6	80.7
Strongly Disagree	15	16.5	17.0	97.7
Unsure	2	2.2	2.3	100.0
Total	88	96.7	100.0	
Total	91	100.0		

As can be seen from frequency table 68 for question number 26, which corresponds to “I trust an informant when another good source says he or she is dependable,” 30 of the 88 respondents chose *mildly agree*, which is 34.1% of the overall respondents; 17 of the 88 respondents chose *mildly disagree*, which is 19.3% of the overall respondents; 15 of the 88 respondents chose *strongly disagree*, which is 17.0% of the overall respondents; 12 of the 88 respondents chose *strongly agree*, which is 13.6% of the overall respondents; 12 of the 88 respondents chose *disagree*, which is 13.6% of the overall respondents; 2 of the 88 respondents chose *unsure*, which is 2.3% of the overall respondents; and 3 of the 91 participants who answered the survey did not answer this question.

Table 69:

Descriptive Statistics for Variables in Shannon and Weaver's Theory, Q. 27

The meaning of words that undercover police use in the office changes when the undercover officer is on the streets

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Agree	3	3.3	3.4	3.4
Agree	26	28.6	29.5	33.0
Mildly Agree	22	24.2	25.0	58.0
Mildly Disagree	10	11.0	11.4	69.3
Disagree	11	12.1	12.5	81.8
Strongly Disagree	1	1.1	1.1	83.0
Unsure	15	16.5	17.0	100.0
Total	88	96.7	100.0	
Total	91	100.0		

As can be seen from frequency table 69 for question number 27, which corresponds to “The meaning of words that undercover police use in the office changes when the undercover officer is on the streets,” 26 of the 88 respondents chose *agree*, which is 29.5% of the overall respondents; 22 of the 88 respondents chose *mildly agree*, which is 25.0% of the overall respondents; 15 of the 88 respondents chose *unsure*, which is 17.0% of the overall respondents; 11 of the 88 respondents chose *disagree*, which is 12.5% of the overall respondents; 10 of the 88 respondents chose *mildly disagree*, which is 11.4% of the overall respondents; 3 of the 88 respondents chose *strongly agree*, which is 3.4% of the overall respondents; 1 of the 88 respondents chose *strongly disagree*, which is 1.1% of the overall respondents; and 3 of the 91 participants who answered the survey did not answer this question.

Table 70

Descriptive Statistics for Variables in Shannon and Weaver's Theory, Q. 28

Politicians interfere with good undercover work				
	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Agree	4	4.4	4.5	4.5
Agree	18	19.8	20.5	25.0
Mildly Agree	22	24.2	25.0	50.0
Mildly Disagree	19	20.9	21.6	71.6
Disagree	14	15.4	15.9	87.5
Strongly Disagree	1	1.1	1.1	88.6
Unsure	10	11.0	11.4	100.0
Total	88	96.7	100.0	
Total	91	100.0		

As can be seen from frequency table 70 for question number 28, which corresponds to “Politicians interfere with good undercover work,” 22 of the 88 respondents chose *mildly agree*, which is 25.0% of the overall respondents; 19 of the 88 respondents chose *mildly disagree*, which is 21.6% of the overall respondents; 18 of the 88 respondents chose *agree*, which is 20.5% of the overall respondents; 14 of the 88 respondents chose *disagree*, which is 15.9% of the overall respondents; 10 of the 88 respondents chose *unsure*, which is 11.4% of the overall respondents; 4 of the 88 respondents chose *strongly agree*, which is 4.5% of the overall respondents; 1 of the 88 respondents chose *strongly disagree*, which is 1.1% of the overall respondents; and 3 of the 91 participants who answered the survey did not answer this question.

Table 71

Descriptive Statistics for Variables in Shannon and Weaver's Theory, Q. 29

Review boards get in the way of good undercover work				
	Frequency	Percent Valid	Percent	Cumulative Percent
Valid Strongly Agree	2	2.2	2.3	2.3
Agree	4	4.4	4.5	6.8
Mildly Agree	18	19.8	20.5	27.3
Mildly Disagree	20	22.0	22.7	50.0
Disagree	21	23.1	23.9	73.9
Strongly Disagree	3	3.3	3.4	77.3
Unsure	20	22.0	22.7	100.0
Total	88	96.7	100.0	
Total	91	100.0		

As can be seen from frequency table 71 for question number 29, which corresponds to “Review boards get in the way of good undercover work,” 21 of the 88 respondents chose *disagree*, which is 23.9% of the overall respondents; 20 of the 88 respondents chose *mildly disagree*, which is 22.7% of the overall respondents, 20 of the 88 respondents chose *unsure*, which is 22.7% of the overall respondents; 18 of the 88 respondents chose *mildly agree*, which is 20.5% of the overall respondents; 4 of the 88 respondents chose *agree*, which is 4.5% of the overall respondents, 3 of the 88 respondents chose *strongly disagree*, which is 3.4% of the overall respondents; 2 of the 88 respondents chose *strongly agree*, which is 2.2% of the overall respondents; and 3 of the 91 participants who answered the survey did not answer this question.

Table 72

Descriptive Statistics for Variables in Shannon and Weaver's Theory, Q. 30

Legislators interfere with good undercover work				
	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Agree	2	2.2	2.3	2.3
Agree	9	9.9	10.2	12.5
Mildly Agree	20	22.0	22.7	35.2
Mildly Disagree	21	23.1	23.9	59.1
Disagree	20	22.0	22.7	81.8
Strongly Disagree	1	1.1	1.1	83.0
Unsure	15	16.5	17.0	100.0
Total	88	96.7	100.0	
Total	91	100.0		

As can be seen from frequency table 72 for question number 30, which corresponds to “Legislators interfere with good undercover work,” 21 of the 88 respondents chose *mildly disagree*, which is 23.9% of the overall respondents; 20 of the 88 respondents chose *mildly agree*, which is 22.7% of the overall respondents; 20 of the 88 respondents chose *disagree*, which is 22.7% of the overall respondents; 15 of the 88 respondents chose *unsure*, which is 17.0% of the overall respondents; 9 of the 88 respondents chose *agree*, which is 10.2% of the overall respondents; 2 of the 88 respondents chose *strongly agree*, which is 2.3% of the overall respondents; 1 of the 88 respondents chose *strongly disagree*, which is 1.1% of the overall respondents; and 3 of the 91 participants who answered the survey did not answer this question.

Table 73

Descriptive Statistics for Variables in Shannon and Weaver's Theory, Q. 31

Politicians understand undercover work				
	Frequency	Percent Valid	Percent	Cumulative Percent
Valid Strongly Agree	1	1.1	1.1	1.1
Agree	1	1.1	1.1	2.3
Mildly Agree	4	4.4	4.5	6.8
Mildly Disagree	17	18.7	19.3	26.1
Disagree	21	23.1	23.9	50.0
Strongly Disagree	38	41.8	43.2	93.2
Unsure	6	6.6	6.8	100.0
Total	88	96.7	100.0	
Total	91	100.0		

As can be seen from frequency table 73 for question number 31, which corresponds to “Politicians understand undercover work,” 38 of the 88 respondents chose *strongly disagree*, which is 43.2% of the overall respondents; 21 of the 88 respondents chose *disagree*, which is 23.9% of the overall respondents; 17 of the 88 respondents chose *mildly disagree*, which is 19.3% of the overall respondents, 6 of the 88 respondents chose *unsure*, which is 6.8% of the overall respondents; 4 of the 88 respondents chose *mildly agree*, which is 4.5% of the overall respondents; 1 of the 88 respondents chose *strongly agree*, which is 1.1% of the overall respondents; 1 of the 88 respondents chose *agree*, which is 1.1% of the overall respondents; and 3 of the 91 participants who answered the survey did not answer this question.

Table 74

Descriptive Statistics for Variables in Shannon and Weaver's Theory, Q. 32

Undercover police have to "think like the bad guy"				
	Frequency	Percent Valid	Percent	Cumulative Percent
Valid Strongly Agree	20	22.0	22.7	22.7
Agree	36	39.6	40.9	63.6
Mildly Agree	24	26.4	27.3	90.9
Mildly Disagree	3	3.3	3.4	94.3
Disagree	3	3.3	3.4	97.7
Strongly Disagree	1	1.1	1.1	98.9
Unsure	1	1.1	1.1	100.0
Total	88	96.7	100.0	
Total	91	100.0		

As can be seen from frequency table 74 for question number 32, which corresponds to "Undercover police have to 'think like the bad guy,'" 36 of the 88 respondents chose *agree*, which is 40.9% of the overall respondents; 24 of the 88 respondents chose *mildly agree*, which is 27.3% of the overall respondents; 20 of the 88 respondents chose *strongly agree*, which is 22.7% of the overall respondents; 3 of the 88 respondents chose *mildly disagree*, which is 3.4% of the overall respondents; 3 of the 88 respondents chose *disagree*, which is 3.4% of the overall respondents; 1 of the 88 respondents chose *strongly disagree*, which is 1.1% of the overall respondents; 1 of the 88 respondents chose *unsure*, which is 1.1% of the overall respondents; and 3 of the 91 participants who answered the survey did not answer this question.

Table 75

Descriptive Statistics for Variables in Shannon and Weaver's Theory, Q. 33

Understanding how words were used differently on the streets was a problem for me in the beginning of my profession

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Agree	2	2.2	2.3	2.3
Valid Agree	22	24.2	25.3	27.6
Valid Mildly Agree	23	25.3	26.4	54.0
Valid Mildly Disagree	11	12.1	12.6	66.7
Valid Disagree	26	28.6	29.9	96.6
Valid Strongly Disagree	1	1.1	1.1	97.7
Valid Unsure	2	2.2	2.3	100.0
Valid Total	87	95.6	100.0	
Total	91	100.0		

As can be seen from frequency table 75 for question number 33, which corresponds to “Understanding how words were used differently on the streets was a problem for me in the beginning of my profession,” 26 of the 87 respondents chose *disagree*, which is 29.9% of the overall respondents; 23 of the 87 respondents chose *mildly agree*, which is 26.4% of the overall respondents; 22 of the 87 respondents chose *agree*, which is 25.3% of the overall respondents; 11 of the 87 respondents chose *mildly disagree*, which is 12.6% of the overall respondents; 2 of the 87 respondents chose *strongly agree*, which is 2.3% of the overall respondents; 2 of the 87 respondents chose *unsure*, which is 2.3% of the overall respondents; and 3 of the 91 participants who answered the survey did not answer this question.

Table 76

Descriptive Statistics for Variables in Shannon and Weaver's Theory, Q. 34

Undercover police have to fit in or pass for bad guys					
		Frequency	Percent Valid	Percent	Cumulative Percent
Valid	Strongly Agree	25	27.5	28.7	28.7
	Agree	44	48.4	50.6	79.3
	Mildly Agree	15	16.5	17.2	96.6
	Disagree	2	2.2	2.3	98.9
	Strongly Disagree	1	1.1	1.1	100.0
	Total	87	95.6	100.0	
Total		91	100.0		

As can be seen from frequency table 76 for question number 34, which corresponds to “Undercover police have to fit in or pass for bad guys,” 44 of the 87 respondents chose *agree*, which is 50.6% of the overall respondents; 25 of the 87 respondents chose *strongly agree*, which is 28.7% of the overall respondents; 15 of the 87 respondents chose *mildly agree*, which is 17.2% of the overall respondents; 2 of the 87 respondents chose *disagree*, which is 2.3% of the overall respondents; 1 of the 87 respondents chose *strongly disagree*, which is 1.1% of the overall respondents; and 3 of the 91 participants who answered the survey did not answer this question.

Table 77

Descriptive Statistics for Variables in Shannon and Weaver’s Theory, Q. 35

The families of undercover cops understand and support their work				
	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Agree	6	6.6	6.9	6.9
Agree	23	25.3	26.4	33.3
Mildly Agree	29	31.9	33.3	66.7
Valid Mildly Disagree	11	12.1	12.6	79.3
Disagree	8	8.8	9.2	88.5
Unsure	10	11.0	11.5	100.0
Total	87	95.6	100.0	
Total	91	100.0		

As can be seen from frequency table 77 question number 35, which corresponds to “The families of undercover cops understand and support their work,” 29 of the 87 respondents chose *mildly agree*, which is 33.3% of the overall respondents; 23 of the 87 respondents chose *agree*, which is 26.4% of the overall respondents; 11 of the 87 respondents chose *mildly disagree*, which is 12.6% of the overall respondents; 10 of the 87 respondents chose *unsure*, which is 11.5% of the overall respondents; 8 of the 87 respondents chose *disagree*, which is 9.2% of the overall respondents; 6 of the 87 respondents chose *strongly agree*, which is 6.9% of the overall respondents; and 4 of the 91 participants who answered the survey did not answer this question.

The Analysis of Descriptive Statistics of Shannon and Weaver for the Transformation Stage Indicators

Tables 65-77 indicate the descriptive statistics related to responses to the questions derived from Shannon and Weaver’s Information Theory in order to test the effect of source and noise in the SVI model. The values, more specifically, indicate that an average undercover

officer thinks like a bad guy in conducting his/her job. In addition, they strikingly believe that politicians do not understand the undercover job. This lack of understanding may lead to noise. In this section I tried to ask questions also to measure the trust in one of the information sources, informants. Undercover police officers, on average, have little trust in their informants. Table 78 summarizes these findings.

Table-78

Summary of Descriptive Statistics for Variables in Shannon and Weaver's Theory

<i>Question Group</i>	<i>Question Number</i>	<i>Mode</i>	<i>Validation Percentages (%)</i>	<i>Corresponding Items in the SVI Model</i>	<i>Corresponding Stage of the SVI Model</i>
Shannon and Weaver theory (13)	23	SD-Trust informant	21.6 (A/MA)	Source and Noise	Transformation Stage
	24	SD-Trust infor, no cor	6.8 (MA)		
	25	MA-Trust info history	59.8 (A/MA)		
	26	MA-Trust info source	47.7 (A/MA)		
	27	A-Meaning of words	58.0 (SA/A/MA)		
	28	MA-Politicians	50.0 (SA/A/MA)		
	29	D-Review board	27.3 (SA/A/MA)		
	30	MD-Legislator	35.2 (SA/A/MA)		
	31	SD-Politicians	6.8 (SA/A/MA)		
	32	A-Think like bad guy	90.9 (SA/A/MA)		
	33	D-Different words	54.0 (SA/A/MA)		
	34	A-Fit in or pass bad	96.6 (SA/A/MA)		
	35	MA-Family	66.7 (SA/A/MA)		

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Table 79

Descriptive Statistics for Variables Related to Wittgenstein's Theory, Q. 43

Undercover police have a distinct language or verbal communication				
	Frequency	Percent Valid	Percent	Cumulative Percent
Valid Strongly Agree	6	6.6	6.8	6.8
Agree	30	33.0	34.1	40.9
Mildly Agree	30	33.0	34.1	75.0
Mildly Disagree	11	12.1	12.5	87.5
Disagree	8	8.8	9.1	96.6
Strongly Disagree	1	1.1	1.1	97.7
Unsure	2	2.2	2.3	100.0
Total	88	96.7	100.0	
Total	91	100.0		

As can be seen from frequency table 79 for question number 43, which corresponds to “Undercover police have a distinct language or verbal communication,” 30 of the 88 respondents chose *agree*, which is 34.1% of the overall respondents; 30 of the 88 respondents chose *mildly agree*, which is 34.1 of the overall respondents; 11 of the 88 respondents chose *mildly disagree*, which is 12.5% of the overall respondents; 8 of the 88 respondents chose *disagree*, which is 9.1% of the overall respondents; 6 of the 88 respondents chose *strongly agree*, which is 6.8% of the overall respondents; 2 of the 88 respondents chose *unsure*, which is 2.3% of the overall respondents; 1 of the 88 respondents chose *strongly disagree*, which is 1.1% of the overall respondents; and 3 of the 91 participants who answered the survey did not answer this question.

Table 80

Descriptive Statistics for Variables Related to Wittgenstein's Theory, Q. 44

Undercover police have their own special meanings for regular words				
	Frequency	Percent Valid	Percent	Cumulative Percent
Valid Strongly Agree	3	3.3	3.4	3.4
Agree	24	26.4	27.3	30.7
Mildly Agree	30	33.0	34.1	64.8
Mildly Disagree	14	15.4	15.9	80.7
Disagree	11	12.1	12.5	93.2
Strongly Disagree	1	1.1	1.1	94.3
Unsure	5	5.5	5.7	100.0
Total	88	96.7	100.0	
Total	91	100.0		

As can be seen from frequency table 80 for question number 44, which corresponds to “Undercover police have their own special meanings for regular words,” 30 of the 88 respondents chose *mildly agree*, which is 34.1% of the overall respondents; 24 of the 88 respondents chose *agree*, which is 27.3% of the overall respondents; 14 of the 88 respondents chose *mildly disagree*, which is 15.9% of the overall respondents; 11 of the 88 respondents chose *disagree*, which is 12.5% of the overall respondents; 5 of the 88 respondents chose *unsure*, which is 5.7% of the overall respondents, 3 of the 88 respondents chose *strongly agree*, which is 3.4% of the overall respondents; 1 of the 88 respondents chose *strongly disagree*, which is 1.1% of the overall respondents; and 3 of the 91 participants who answered the survey did not answer this question.

Table 81

Descriptive Statistics for Variables Related to Wittgenstein's Theory, Q. 45

Undercover police have to speak the same language as informers				
		Frequency	Percent Valid	Cumulative Percent
Valid	Strongly Agree	6	6.6	6.8
	Agree	46	50.5	59.1
	Mildly Agree	21	23.1	83.0
	Mildly Disagree	9	9.9	93.2
	Disagree	6	6.6	100.0
	Total	88	96.7	100.0
Total		91	100.0	

As can be seen from frequency table 81 for question number 45, which corresponds to “Undercover police have to speak the same language as informers,” 46 of the 88 respondents chose *agree*, which is 52.3% of the overall respondents; 21 of the 88 respondents chose *mildly agree*, which is 23.9% of the overall respondents; 9 of the 88 respondents chose *mildly disagree*, which is 10.2% of the overall respondents; 6 of the 88 respondents chose *disagree*, which is 6.8% of the overall respondents; 6 of the 88 respondents chose *strongly agree*, which is 6.8% of the overall respondents; and 3 of the 91 participants who answered the survey did not answer this question.

Table 82

Descriptive Statistics for Variables Related to Wittgenstein's Theory, Q. 46

Undercover team members have a language that only they would understand				
	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Agree	1	1.1	1.1	1.1
Agree	11	12.1	12.5	13.6
Mildly Agree	24	26.4	27.3	40.9
Mildly Disagree	25	27.5	28.4	69.3
Disagree	21	23.1	23.9	93.2
Strongly Disagree	4	4.4	4.5	97.7
Unsure	2	2.2	2.3	100.0
Total	88	96.7	100.0	
Total	91	100.0		

As can be seen from frequency table 82 for question number 46, which corresponds to “Undercover team members have a language that only they would understand,” 25 of the 88 respondents chose *mildly disagree*, which is 28.4% of the overall respondents; 24 of the 88 respondents chose *mildly agree*, which is 27.3% of the overall respondents; 21 of the 88 respondents chose *disagree*, which is 23.9% of the overall respondents; 11 of the 88 respondents chose *agree*, which is 12.5% of the overall respondents; 4 of the 88 respondents chose *strongly disagree*, which is 4.5% of the overall respondents; 2 of the 88 respondents chose *unsure*, which is 2.3% of the overall respondents; 1 of the 88 respondents chose *strongly agree*, which is 1.1% of the overall respondents; and 3 of the 91 participants who answered the survey did not answer this question.

Table 83

Descriptive Statistics for Variables Related to Wittgenstein's Theory, Q. 47

Undercover police and bad guys are able to speak the same language				
	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Agree	6	6.6	6.9	6.9
Agree	40	44.0	46.0	52.9
Mildly Agree	30	33.0	34.5	87.4
Valid Mildly Disagree	5	5.5	5.7	93.1
Disagree	4	4.4	4.6	97.7
Unsure	2	2.2	2.3	100.0
Total	87	95.6	100.0	
<hr/>				
Total	91	100.0		

As can be seen from frequency table 83 for question number 47, which corresponds to “Undercover police and bad guys are able to speak the same language,” 40 of the 87 respondents chose *agree*, which is 46.0% of the overall respondents; 30 of the 87 respondents chose *mildly agree*, which is 34.5% of the overall respondents; 6 of the 87 respondents chose *strongly agree*, which is 6.9% of the overall respondents; 5 of the 87 respondents chose *mildly disagree*, which is 5.7% of the overall respondents; 4 of the 87 respondents chose *strongly disagree*, which is 4.6% of the overall respondents; 2 of the 88 respondents chose *unsure*, which is 2.3% of the overall respondents; and 4 of the 91 participants who answered the survey did not answer this question.

Table 84

Descriptive Statistics for Variables Related to Wittgenstein's Theory, Q. 48

Undercover cops use their own language when talking to each other				
	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Agree	3	3.3	3.4	3.4
Agree	23	25.3	26.4	29.9
Mildly Agree	19	20.9	21.8	51.7
Mildly Disagree	19	20.9	21.8	73.6
Disagree	15	16.5	17.2	90.8
Strongly Disagree	2	2.2	2.3	93.1
Unsure	6	6.6	6.9	100.0
Total	87	95.6	100.0	
Total	91	100.0		

As can be seen from frequency table 84 for question number 48, which corresponds to “Undercover cops use their own language when talking to each other,” 23 of the 87 respondents chose *agree*, which is 26.4% of the overall respondents; 19 of the 87 respondents chose *mildly agree*, which is 21.8% of the overall respondents; 19 of the 87 respondents chose *mildly disagree*, which is 21.8% of the overall respondents; 15 of the 87 respondents chose *disagree*, which is 17.2% of the overall respondents; 6 of the 87 respondents chose *unsure*, which is 6.9% of the overall respondents; 3 of the 87 respondents chose *strongly agree*, which is 3.4% of the overall respondents; 2 of the 87 respondents chose *strongly disagree*, which is 2.3% of the overall respondents; and 4 of the 91 participants who answered the survey did not answer this question.

Table 85

Descriptive Statistics for Variables Related to Wittgenstein's Theory, Q. 49

Undercover police learn the language of the streets from their colleagues				
	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Agree	3	3.3	3.4	3.4
Agree	21	23.1	24.1	27.6
Mildly Agree	36	39.6	41.4	69.0
Mildly Disagree	16	17.6	18.4	87.4
Disagree	8	8.8	9.2	96.6
Strongly Disagree	1	1.1	1.1	97.7
Unsure	2	2.2	2.3	100.0
Total	87	95.6	100.0	
Total	91	100.0		

As can be seen from frequency table 85 for question number 49, which corresponds to “Undercover police learn the language of the streets from their colleagues,” 36 of the 87 respondents chose *mildly agree*, which is 41.4% of the overall respondents; 21 of the 87 respondents chose *agree*, which is 24.1% of the overall respondents; 16 of the 87 respondents chose *mildly disagree*, which is 18.4% of the overall respondents; 8 of the 87 respondents chose *disagree*, which is 9.2% of the overall respondents; 3 of the 87 respondents chose *strongly agree*, which is 3.4% of the overall respondents; 2 of the 87 respondents chose *unsure*, which is 2.3% of the overall respondents; 1 of the 87 respondents chose *strongly disagree*, which is 1.1% of the overall respondents; and 4 of the 91 participants who answered the survey did not answer this question.

Table 86

Descriptive Statistics for Variables Related to Wittgenstein's Theory, Q. 52.1

Use a different way of speaking than I do normally

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Always	11	12.1	12.2	12.2
Usually	29	31.9	32.2	44.4
Frequently	16	17.6	17.8	62.2
Sometimes	22	24.2	24.4	86.7
Rarely	5	5.5	5.6	92.2
Never	4	4.4	4.4	96.7
Unsure	3	3.3	3.3	100.0
Total	90	98.9	100.0	
Total	91	100.0		

As can be seen from frequency table 86 for question number 52.1, which corresponds to “Use a different way of speaking than I do normally,” 29 of the 90 respondents (32.2%) chose *usually*. Twenty-two of the 90 respondents (24.4%) chose *sometimes*. Sixteen of the 90 respondents (17.8%) chose *frequently*. Eleven of the 90 respondents (12.2%) chose *always*. Five of the 90 respondents (5.6%) chose *rarely*. Four of the 90 respondents (4.4%) chose *never*. Three of the 90 respondents (3.3%) chose *unsure*, and 1 of the 91 participants who answered the survey did not answer this question.

Table 87

Descriptive Statistics for Variables Related to Wittgenstein's Theory, Q. 52.2

Use different words than I do in other aspects of my life					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Always	11	12.1	12.2	12.2
	Usually	29	31.9	32.2	44.4
	Frequently	25	27.5	27.8	72.2
	Sometimes	15	16.5	16.7	88.9
	Rarely	6	6.6	6.7	95.6
	Never	2	2.2	2.2	97.8
	Unsure	2	2.2	2.2	100.0
	Total	90	98.9	100.0	
Total	91	100.0			

As can be seen from the frequency table for question number 52.2, which corresponds to “Use different words than I do in other aspects of my life,” 29 of the 90 respondents (32.2%) chose *usually*. Twenty-five of the 90 respondents (27.8%) chose *frequently*. Fifteen of the 90 respondents (16.7%) chose *sometimes*. Eleven of the 90 respondents (12.2%) chose *always*. Six of the 90 respondents (6.7%) chose *rarely*. Two of the 90 respondents (2.2%) chose *never*. Two of the 90 respondents (2.2%) chose *unsure*, and 1 of the 91 participants who answered the survey did not answer this question.

Table 88

Descriptive Statistics for Variables Related to Wittgenstein's Theory, Q. 52.3

When undercover, encounter people who use language differently than I do

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Always	7	7.7	7.9	7.9
Usually	24	26.4	27.0	34.8
Frequently	35	38.5	39.3	74.2
Sometimes	14	15.4	15.7	89.9
Rarely	5	5.5	5.6	95.5
Never	1	1.1	1.1	96.6
Unsure	3	3.3	3.4	100.0
Total	89	97.8	100.0	
Total	91	100.0		

As can be seen from frequency table 88 for question number 52.3, which corresponds to “When undercover, encounter people who use language differently than I do,” 35 of the 89 respondents (39.3%) chose *frequently*, 24 of the 89 respondents (27.0%) chose *usually*. Fourteen of the 89 respondents (15.7%) chose *sometimes*. Seven of the 89 respondents (7.9%) chose *always*. Five of the 89 respondents (5.6%) chose *rarely*. Three of the 89 respondents (3.4%) chose *unsure*. Two of the 89 respondents (2.2%) chose *never*, and 2 of the 91 participants who answered the survey did not answer this question.

Table 89

Descriptive Statistics for Variables Related to Wittgenstein's Theory, Q. 52.4

Find that working undercover has its own unwritten rules				
	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Always	5	5.5	5.6
	Usually	17	18.7	19.1
	Frequently	20	22.0	22.5
	Sometimes	25	27.5	28.1
	Rarely	12	13.2	13.5
	Never	4	4.4	4.5
	Unsure	6	6.6	6.7
	Total	89	97.8	100.0
Total	91	100.0		

As can be seen from frequency table 89 for question number 52.4, which corresponds to “Find that working undercover has its own unwritten rules,” 25 of the 89 respondents (28.1%) chose *sometimes*. Twenty of the 89 respondents (22.5%) chose *frequently*. Seventeen of the 89 respondents (19.1%) chose *usually*. Twelve of the 89 respondents (13.5%) chose *rarely*. Six of the 89 respondents (6.7%) chose *unsure*. Five of the 89 respondents (5.6%) chose *always*. Four of the 89 respondents (4.5%) chose *never*, and 2 of the 91 participants who answered the survey did not answer this question.

Table 90

Descriptive Statistics for Variables Related to Wittgenstein's Theory, Q. 52.5

Use different terminology with colleagues					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Always	5	5.5	5.7	5.7
	Usually	17	18.7	19.3	25.0
	Frequently	21	23.1	23.9	48.9
	Sometimes	29	31.9	33.0	81.8
	Rarely	12	13.2	13.6	95.5
	Never	2	2.2	2.3	97.7
	Unsure	2	2.2	2.3	100.0
	Total	88	96.7	100.0	
Total	91	100.0			

As can be seen from frequency table 90 for question number 52.5, which corresponds to “Use different terminology with colleagues,” 29 of the 88 respondents (33.0%) chose *sometimes*. Twenty-one of the 88 respondents (23.9%) chose *frequently*. Seventeen of the 88 respondents (19.3%) chose *usually*. Twelve of the 88 respondents (13.6%) chose *rarely*. Five of the 88 respondents (5.7%) chose *always*. Two of the 88 respondents (2.3%) chose *unsure*. Two of the 88 respondents (2.3%) chose *never*, and 3 of the 91 participants who answered the survey did not answer this question.

The Analysis of Descriptive Statistics of Ludwig Wittgenstein for the Transformation Stage Indicators

Tables 79-90 indicate the descriptive statistics related to responses to the questions derived from Ludwig Wittgenstein's Language Game Theory in order to test the effect of language and noise source as regards to linguistics in the SVI model. The numbers on the tables, on average, indicate not much disparity between the responses. In other words, the visual inspection of the descriptive statistics indicate that there undercover officers differ in terms of using a peculiar language, but this difference may not be considerable among peers. On the other hand, when they are talking to their informants or acting undercover, their language fits into their environment. Table 91 summarizes these findings.

Table 91

Summary of Descriptive Statistics for Variables Related to Wittgenstein's Theory

<i>Question Group</i>	<i>Question Number</i>	<i>Mode</i>	<i>Validation Percentages (%)</i>	<i>Corresponding Items in the SVI Model</i>	<i>Corresponding Stage of the SVI Model</i>
Wittgenstein model (12)	43	A-MA-Language	75.0 (SA/A/MA)	Source and Noise (Language)	Transformation Stage
	44	MA-Meanings words	64.8 (SA/A/MA)		
	45	A-same language info	83.0 (SA/A/MA)		
	46	MD-they would under	40.9 (SA/A/MA)		
	47	A-speak the same bad	87.4 (SA/A/MA)		
	48	A-own language each	51.7 (SA/A/MA)		
	49	MA-Learn language	69.0 (SA/A/MA)		
	52.1	US-Different speak	62.2 (A/U/F/S)		
	52.2	US-Different words	88.9 (A/U/F/S)		
	52.3	F-Different language	89.9 (A/U/F/S)		
	52.4	S-Unwritten rules	75.3 (A/U/F/S)		
	52.5	S-Different terminology	81.8 (A/U/F/S)		

Table 92

Descriptive Statistics for Variables Related to O'Connor's Model, Q. 36

Undercover work is a simple (doesn't mean easy) process

	Frequency	Percent Valid	Percent	Cumulative Percent
Strongly Agree	1	1.1	1.1	1.1
Agree	8	8.8	9.1	10.2
Mildly Agree	6	6.6	6.8	17.0
Valid Mildly Disagree	17	18.7	19.3	36.4
Disagree	30	33.0	34.1	70.5
Strongly Disagree	26	28.6	29.5	100.0
Total	88	96.7	100.0	
Total	91	100.0		

As can be seen from frequency table 92 for question number 36, which corresponds to “Undercover work is a simple (doesn’t mean easy) process,” 30 of the 88 respondents chose *disagree*, which is 34.1% of the overall respondents; 26 of the 88 respondents chose *strongly disagree*, which is 29.5% of the overall respondents; 17 of the 88 respondents chose *mildly disagree*, which is 19.3% of the overall respondents; 8 of the 88 respondents chose *agree*, which is 9.1% of the overall respondents; 1 of the 88 respondents chose *strongly agree*, which is 1.1% of the overall respondents; and 3 of the 91 participants who answered the survey did not answer this question.

Table 93

Descriptive Statistics for Variables Related to O'Connor's Model, Q. 37

Undercover work follows the same set of rules as general police work				
	Frequency	Percent Valid	Percent	Cumulative Percent
Valid Strongly Agree	3	3.3	3.4	3.4
Agree	22	24.2	25.0	28.4
Mildly Agree	12	13.2	13.6	42.0
Mildly Disagree	14	15.4	15.9	58.0
Disagree	22	24.2	25.0	83.0
Strongly Disagree	14	15.4	15.9	98.9
Unsure	1	1.1	1.1	100.0
Total	88	96.7	100.0	
Total	91	100.0		

As can be seen from frequency table 93 for question number 37, which corresponds to “Undercover work follows the same set of rules as general police work,” 22 of the 88 respondents chose *agree*, which is 25.0% of the overall respondents; 22 of the 88 respondents chose *disagree*, which is 25.0% of the overall respondents; 14 of the 88 respondents chose *mildly disagree*, which is 15.9% of the overall respondents; 14 of the 88 respondents chose *strongly disagree*, which is 15.9% of the overall respondents; 12 of the 88 respondents chose *mildly agree*, which is 13.6% of the overall respondents; 3 of the 88 respondents chose *strongly agree*, which is 3.4% of the overall respondents; 1 of the 88 respondents chose *unsure*, which is 1.1% of the overall respondents; and 3 of the 91 participants who answered the survey did not answer this question.

Table 94

Descriptive Statistics for Variables Related to O'Connor's Model, Q. 38

Undercover work requires juggling between different bits of information					
		Frequency	Percent	Valid Percent	Cumulative Percent
	Strongly Agree	13	14.3	14.8	14.8
	Agree	56	61.5	63.6	78.4
Valid	Mildly Agree	16	17.6	18.2	96.6
	Unsure	3	3.3	3.4	100.0
	Total	88	96.7	100.0	
Total		91	100.0		

As can be seen from frequency table 94 for question number 38, which corresponds to “Undercover work requires juggling between different bits of information,” 56 of the 88 respondents chose *agree*, which is 63.6% of the overall respondents; 16 of the 88 respondents chose *mildly agree*, which is 18.2% of the overall respondents; 13 of the 88 respondents chose *strongly agree*, which is 14.8% of the overall respondents; 3 of the 88 respondents chose *unsure*, which is 3.4% of the overall respondents; and 3 of the 91 participants who answered the survey did not answer this question.

Table 95

Descriptive Statistics for Variables Related to O'Connor's Model, Q. 39

Information seeking and gathering in undercover work requires rapidly changing and mixing tasks

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Agree	21	23.1	23.9	23.9
Agree	54	59.3	61.4	85.2
Mildly Agree	10	11.0	11.4	96.6
Mildly Disagree	1	1.1	1.1	97.7
Unsure	2	2.2	2.3	100.0
Total	88	96.7	100.0	
Total	91	100.0		

As can be seen from the frequency table 95 for question number 39, which corresponds to “Information seeking and gathering in undercover work requires rapidly changing and mixing tasks,” 54 of the 88 respondents chose *agree*, which is 61.4% of the overall respondents; 21 of the 88 respondents chose *strongly agree*, which is 23.9% of the overall respondents; 10 of the 88 respondents chose *mildly agree*, which is 11.4% of the overall respondents; 2 of the 88 respondents chose *unsure*, which is 2.3% of the overall respondents; 1 of the 88 respondents chose *unsure*, which is 1.1% of the overall respondents; and 3 of the 91 participants who answered the survey did not answer this question.

Table 96

Descriptive Statistics for Variables Related to O'Connor's Model, Q. 40

Undercover work has more gray areas than regular police work

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Agree	12	13.2	14.0	14.0
Agree	35	38.5	40.7	54.7
Mildly Agree	22	24.2	25.6	80.2
Valid Mildly Disagree	4	4.4	4.7	84.9
Disagree	10	11.0	11.6	96.5
Unsure	3	3.3	3.5	100.0
Total	86	94.5	100.0	
<hr/>				
Total	91	100.0		

As can be seen from frequency table 96 for question number 40, which corresponds to “Undercover work has more gray areas than regular police work,” 35 of the 86 respondents chose *agree*, which is 40.7% of the overall respondents; 22 of the 86 respondents chose *mildly agree*, which is 25.6% of the overall respondents; 12 of the 86 respondents chose *strongly agree*, which is 14.0% of the overall respondents; 10 of the 86 respondents chose *disagree*, which is 11.6% of the overall respondents; 4 of the 86 respondents chose *mildly disagree*, which is 4.7% of the overall respondents; 3 of the 86 respondents chose *unsure*, which is 3.5% of the overall respondents; and 5 of the 91 participants who answered the survey did not answer this question.

Table 97

Descriptive Statistics for Variables Related to O'Connor's Model, Q. 41

Undercover work requires the evaluating and reevaluating of pieces of information					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	27	29.7	31.0	31.0
	Agree	58	63.7	66.7	97.7
	Mildly Agree	2	2.2	2.3	100.0
	Total	87	95.6	100.0	
Total		91	100.0		

As can be seen from frequency table 97 for question number 41, which corresponds to “Undercover work requires the evaluating and reevaluating of pieces of information,” 58 of the 87 respondents chose *agree*, which is 66.7% of the overall respondents; 27 of the 87 respondents chose *strongly agree*, which is 31.0% of the overall respondents; 3 of the 87 respondents chose *mildly agree*, which is 2.3% of the overall respondents; and 4 of the 91 participants who answered the survey did not answer this question.

Table 98

Descriptive Statistics for Variables Related to O'Connor's Model, Q. 42

Making decisions without enough information is commonly done in undercover work

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Agree	6	6.6	6.9	6.9
Agree	25	27.5	28.7	35.6
Mildly Agree	18	19.8	20.7	56.3
Mildly Disagree	19	20.9	21.8	78.2
Disagree	10	11.0	11.5	89.7
Strongly Disagree	7	7.7	8.0	97.7
Unsure	2	2.2	2.3	100.0
Total	87	95.6	100.0	
Total	91	100.0		

As can be seen from frequency table 98 for question number 42, which corresponds to “Making decisions without enough information is commonly done in undercover work,” 25 of the 87 respondents chose *agree*, which is 28.7% of the overall respondents; 19 of the 87 respondents chose *mildly disagree*, which is 21.8% of the overall respondents; 18 of the 87 respondents chose *mildly agree*, which is 20.7% of the overall respondents; 10 of the 87 respondents chose *disagree*, which is 11.5% of the overall respondents; 7 of the 87 respondents chose *strongly disagree*, which is 8.0% of the overall respondents; 6 of the 87 respondents chose *strongly agree*, which is 6.9% of the overall respondents; 2 of the 87 respondents chose *unsure*, which is 2.3% of the overall respondents; and 4 of the 91 participants who answered the survey did not answer this question.

*The Analysis of Descriptive Statistics of O'Connor for the
Transformation Stage Indicators*

Tables 92-98 indicates the descriptive statistics related to responses to the questions derived from O'Connor's hunting and gathering model in order to test the effect of experiential elements in the SVI model. The numbers on these questions, on average, indicate that the subjects, on average, believe that their job requires more hunting than just simple gathering. In other words, they believe that undercover policing requires more experience and adaptation to the dynamic characteristics of those environments. Table 99 summarizes these findings.

Finally, the descriptive statistics, overall, indicate that there are no outliers. All of the values are at the expected range. There are too few missing values to jeopardize the validity of the results.

Table 99

Summary of Descriptive Statistics for Variables Related to O'Connor's Model

<i>Question Group</i>	<i>Question Number</i>	<i>Mode</i>	<i>Validation Percentages (%)</i>	<i>Corresponding Items in the SVI Model</i>	<i>Corresponding Stage of the SVI Model</i>
O'Connor Model (7)	36	D-Simple process	17.0 (SA/A/MA)	Experience	Transformation Stage
	37	A-D-Same rules pol	42.0 (SA/A/MA)		
	38	A-Juggling	96.6 (SA/A/MA)		
	39	A-Rapidly changing	96.6 (SA/A/MA)		
	40	A-Gray areas	80.2 (SA/A/MA)		
	41	A-Evaluate reevaluate	100.0 (SA/A/MA)		
	42	A-Without enough info	100.0 (SA/A/MA)		

The Analysis of Open-ended Questions

Question 54 asked, “What factors can influence your information seeking and gathering?” Answers to this question will shed light on components of the model, such as noise and source. For instance, some of the noise elements suggested by the officers in response to this question include stress, health, family, lies told by informants, workload, time, money, department policy and laws. All of the previous noise elements were listed as things that may influence the information seeking and gathering behavior of the officers. Overall, time was the most commonly suggested noise element influencing information seeking. Officers also suggested several sources of information used, such as internal and external databases, past investigations, citizen complaints, reliable informants, and other officers. Officers frequently mentioned that “the case itself” influenced their information seeking and gathering. For example, the level of security, the severity of the crime, and the past criminal records of the

suspects involved influence how the officers search for information. It was not clearly stated from the responses what effects these elements of the case might have on information gathering.

Question 55 asks, “How do you start your ground work to solve a specific task?” This question was asked to understand what initial sources of information were used by the officers. The most frequently mentioned sources were databases that contain background information (vehicle identification and criminal history) and past case history. Some of the answers were more general such as, “[I] gather as much information as possible.” In addition to source information, officers suggested that they tried to analyze the specific aspects of the case and then lay out a plan of action. One officer stated “put in an order of tasks to establish and reach the given goal, set up a to-do list and prioritize the steps.” This suggests that there is an evaluation process after the initial basic case information before the officers go about finding more information. This supports the ideas of O’Connor concerning information juggling and evaluating in the research process.

Question 56 asks, “How do you search for and use your information source for a specific case/assignment? Is there a pattern for this?” In response to this question almost all the officers stated similar ideas. They work with the information that is readily available first and then move on from there, depending on the nature of this information. Most research starts out in-house, using the case files, databases, etc., and then moves outward to surveillance, informants, search warrants, and other more complex and involved methods. As one officer put it, “quickest and easiest first, working toward what develops.” Even officers who stated that they did not use a pattern went on to describe this process.

Question 57 asks, “How do you interact with your information sources?” The responses to this question were varied due to a misunderstanding of the question. The question would need

to be clarified and restated for future research. However, those that took the question to be asking about how they interact with those people who provide information stated that communication is usually done in person, through phone calls, and via e-mail. It was suggested that dealings with informants was mostly done in person.

Question 58 asks, “How do you match the expectations of your supervisors with your ways of finding information?” Again with this question, the answers were varied. Some stated that they follow departmental procedures and laws of investigation; therefore, the expectations of the supervisors are always met. Others suggested that they have learned from experience, or from other experienced officers, what is expected of them and then act and do their police work accordingly. Others keep in close contact with their supervisor, so they are able to understand what is expected. Finally, there were others that stated that issues never arise with their supervisors, and there is little contact.

Question 59 and Question 60 were closely related (at least in the mind of those taking the survey). Question 59 asks, “What are your primary information sources for your work?” Question 60 asks, “How do you gather information?” Information sources that were commonly listed in response to Question 59 included specific databases, citizen complaints, other officers, past police reports, informants, information obtained from surveillance and undercover work, governmental and public records, eye witness accounts, and interviews. In response to Question 60, many stated that they had already answered this question or said, “See above.” Those that did list an answer commonly stated that they gathered the initial, easy-to-find information and analyzed that information before determining methods to gather other needed information. One officer described it like this: “review records and read reports. Develop leads from these and then continue with what needs to be done.” Another officer claimed “I obtain an initial base of

information...and work out from there.” Both of these examples (and the responses of others) highlight the fact that information seeking and gathering is a process that includes the reevaluating and juggling of information. There is no straight path that is always to be followed.

Question 61 asks, “How did you learn to fit in?” The respondents interpreted this question in two different ways. Some believed it to be asking about how they learned to fit in with other officers in their department. Others believed it was asking how they learned to fit in with the “bad guys” when working undercover. Regardless of how the question was interpreted, the majority of officers believed it was experience and observation of those in the environment that allowed them to fit in. The experience could come from time and observation at the job, or their increased experience could be a result of training with an experienced mentor.

Analysis of Interview with Undercover Plano Police Department Narcotics Officers

On April 12, 2005, an in-person interview was conducted with 9 members of the Plano Police Department Narcotics Division, including an operational sergeant and eight detectives, all who had been working with the police force for a minimum of seven years. The experiences of the officers whom I interviewed were impressive; on average, these officers had been on the police force for 13.8 years. Officers were shown the SVI model and given time to study the model in relation to their own experiences obtaining and processing information in the undercover environment. Participants in the interview were asked several questions pertaining to the model, and they gave their thoughts and responses on the accuracy of the model. At the end, they were given time to openly discuss their position on the accuracy of the model.

Several themes emerged from an analysis of the interview. First, the officers were in agreement that the model was accurate and that all of the components of the model were needed

to accurately describe their work as police officers and their work in information retrieval and processing. When questioned about the need for all of the components of the model, one officer stated “I agree, if you take one of those out [components of the model], you are not gonna end up with your outputs.” Another officer stated that “I think that as soon as you know what each one of the components mean, then, yeah, we agree the bottom part without one of them you don’t have a cop.” The officers did state, however that there were more possible outcomes than those listed in the model. For example, the officers claimed that a case might end if a suspect dies. Also, a suspect may be turned into an informant, which would start the model all over again.

The second idea that emerged from the interview deals with the concept of “noise.” Most officers felt that all of the concepts in the model were self explanatory except for this concept. That felt that this item needed more clarification. One officer stated that “Credibility, experience and source self-explanatory when I see noise I can’t tell what it is.” Although the officers stated that this concept was not completely clear to them at first glance, they agreed that certain specific instances of noise did hinder their work. For example, they all agreed that politicians could be a source of interference in their information gathering process and then, in turn, would be a source of noise.

A third concept that emerged from the interviews was the bonding of undercover officers. They strongly validated the idea that officers do form their own small world and use a specific sublanguage for their interactions with other officers and their interactions with criminals and others they encounter undercover. This validates the inclusion of the ideas taken from Chatman and Wittgenstein. One officer stated, “You don’t talk to somebody the way you talk to an officer.”

Another idea that emerged from the interview and validates the model is the importance of experience in information seeking. All of the officers agreed that experience plays a large role in gathering information in undercover operations. This experience has to be gained from actual work in the area. They stated several different times that it was experience that allows them to filter through the noise to gain pertinent information. One officer explained it like this, "If you are talking about interview, let's say interview, your experience on that aspect will be sitting in on so many other interviews before listening to them from when you are rookie or narc whatever, just everybody weeding out the information you start learning what is important or what is not real quick." He goes on to say that "I can do a thirty minutes interview and write down less than half a page of notes." The officers also pointed out that in their unit recent graduates did not make it and were unable to do the job. They preferred experienced officers to recent graduates. The safety of the officers depends on experience. With regards to this issue, one officer said, "In a frame of their coming here their no-experience that affects the safety of other police officers here since we rely on their partners, other officers, with our lives here."

With regards to sources of information, the officers discussed finding credible sources of information. Information, whether it be given by an informant or another source, becomes more credible when it can be verified. As one officer explained, "If they say there is dope at 911 Main Street, and the house is blue with red shutters, and there is a black and white car right out there right now, you go and check, and if you see the car matches that house matches that what they say is there, then you- then it makes your credibility a little bit better."

CHAPTER 5

CONCLUSION AND DISCUSSION

Who would look at this model and say it doesn't make sense?

David O'Connor, private investigator

It was shown in data analysis that all components of the social virtual interface (SVI) model were necessary, and the overall structure of the model is accurate. The proposed SVI model is not a simple recipe to follow to maximize the efficiency in the information flow process and gain more expertise. An effective illustration of the model will support assistance and skill development among law enforcement personnel. The application area of the model will produce efficient results in the long run since this kind of crucial experiment is difficult to observe for an outsider. The high response rate seems to indicate that undercover police are interested in a model not only to help them but also to make their work understandable to others – police administrators, politicians, and educators.

According to Dreyfus and Dreyfus (1986), human beings expand their expertise through observation, intuition, and experience. The Dreyfus model of skill transformation includes five stages: novice, advanced beginner, competence, proficiency, and expertise. Novices make decisions via following the rules or conditions precisely with no intent to challenge them and disregarding the overall circumstances. Novices' biggest disadvantage is to become easily discouraged due to lack of experience. Advanced beginners have more expertise because they have been through the same or similar situations before. If any kind of an obstacle happens to be in their way, then they will remember their past experiences and use them to cope with the new situation. Competent learners systematize these experiences into prescribed decision-making methods. Learners at the proficiency level take systemization to transformation and try to find

out the overall circumstances. Experts have the luxury of having a vast amount of past experiences that they can refer to in a given circumstance. Experts don't let rules or regulations limit their vision since the rules are designed to handle simple situations. That's the reason why experts can handle multifaceted situations effectively and are able to instruct novices through supervision (Dreyfus and Dreyfus, 1986). This fits closely with the Ohio vs. Terry decision that police expertise or a "sixth sense" is admissible as evidence and grounds for action.

SVI is a model of human information transformation from data to decisions. The components of the SVI model include assessments of the source, experience, credibility, and obstructions within an open system of human communication. For law enforcement personnel in general, every problem occurs according to its patterns, and law enforcement must solve the problem and correct the flaws. Transformation is a combination of different tasks that should be orchestrated in harmony. Experts go through this "naturally." On the other hand, novices take a significant amount of time to do so. Some of the problems are easy to recognize; more complex problems may take a significant amount of time to deal with. What's more, problems have unstable levels of difficulty.

As an example, when inexperienced police officers encounter problems or are exposed to a case, they tend to jump to conclusions with limited statements. On the other hand, experienced police officers try to see the whole picture. This kind of experience comes with effective training on the job, and partnering an experienced police officer with an inexperienced police officer to observe helps to reduce their possible mistakes.

It is difficult to prepare a new graduate police officer with the experience for the street because formal training curricula rarely include street-wise training, and the graduates are left to develop their skills on their own in their active duty. Fresh graduates begin to gain their persona

and their skills through limited training in the Police Academy. Consequently, it makes sense for fresh graduates to start their professions with experienced partners, and with proper observation and training, these graduates will become better officers more quickly. For the period of this training, officers would gain street-wise experience, which would eventually improve their own skills. Officers with more experience could become better officers because they could rely on their previous experiences to support them. Furthermore, fresh graduates could be assigned to experienced partners carefully, along with a plan of exercises, as early as possible. The SVI model is proposed to improve the practical effectiveness of formal training in the police academy. Submarine chaser, Gary Macallister, when interviewed by O'Connor (O'Connor and Copeland, 2003) frequently spoke of the importance of lessons and informal talk with experienced chasers in developing the abilities of new chasers. The "old guys" have an authority based on having had their "butts in the seats"; they possess knowledge of the little "street-level" realities that deviate from textbook practice; "the thrill to hunt" and "gotcha" feeling might suggest that the SVI model has a biological component or hormone driven sense of competition; old sub chasers provide confirmation and critiquing for the new chasers.

As the interviews of the experienced police officers demonstrate, unlike previous models, the SVI model incorporates a combination of various activities; law enforcement personnel could learn or improve many methods that could make them better officers.

Validation of the SVI model suggests it might be more useful to create a variety of tricks and ways of thinking and seeing, rather than focusing on one or two detailed activities. These would benefit an inexperienced police officer more than formal training in the police academy. As a result of various contacts through the supervision of an experienced mentor, a "rookie"

could learn several techniques and could determine which techniques best improved his or her skills.

To improve police officers' street-wise decision-making skills, mentors should integrate activities throughout an entire curriculum, not just in one training course. Information seeking and gathering on the streets is an important, complicated skill that requires repeated practice and well-prepared training. To reach this goal, the SVI model can be programmed to design activities, which could include an advanced course with experienced police officers in charge.

On a larger scale, a surprising result of the validation of the SVI model is the fitness of Chatman's small world theory for a group Chatman never intended. Chatman's subjects are overtly information poor, and in part, that's why they have gathered together. On the other hand, undercover police officers have a lot of information but some of it may be suspect and/or may not be good at all, and the time requirements for analyzing it may be short. Police officers act in ways that Chatman's small world of information poor act perhaps because having lots of information, as well as lots of difficulty evaluating it, had the same results. This result suggests it might be intriguing for other information rich groups to see if they too could be modeled under Chatman's theory. One validation of the SVI model is that undercover police officers see their work happening with less control and predictability than most people would think.

There are naturally many other ways in which information reaches the police service. The public can report suspicious happenings and discoveries of crimes and use the 911 service. The police in general can be viewed as an organization that receives and responds to information. The interviews with undercover police officers proved that undercover police in particular are viewed as a pool which receives more sensitive information such as information about terrorism,

organized crime, and so forth, and they are responsible for responding to the information accordingly.

Police information sources are not confined to public calls. Indeed, they include departmental investigations, informants, criminal case histories, technical surveillance, other agencies, media, public records, departmental records, governmental records, and so forth. The information received by undercover police has always been contaminated by the barriers hindering confirmation of the reliability of the information being received and noise. For instance, laws, regulations, peers, bureaucracy, politicians, police review boards, bad guys and their families, informants, officers' families, the supervisory officers, the department structure, personal stress level, the chain of command, officers' personal safety, inconsistent communication, work overload, and so forth are some of the factors providing noise in the information processing mechanism of undercover police officers.

The ability to process information, to filter noise, to assess the credibility of information, and to interpret the information received is one of the crucial parts of information processing. This part is categorized under the element of experience in the proposed SVI model.

The elements of the SVI system are source, noise, credibility, and experience. These elements are continuously interacting with each other. They have been shown to have an interactive dynamic relationship, and their combination constitutes the skeleton of the information processing mechanism of undercover policing.

The descriptive charts reveal that not all of the variables used to measure each of the elements are significant. Indeed, only three information sources are significant: technical surveillance, governmental records, and media; yet the other information sources - including departmental investigations, informants, criminal case histories, other agencies, public records,

and departmental records – have significant association with the information processing model proposed in this study.

According to the descriptive analyses, technical surveillance and governmental records contribute to information sources while the media reduce information sources. This is expected since technical surveillance and governmental records have always been known as reliable information sources; while the media may provide noisy and unconfirmed information.

Regarding the noise element, only the bureaucracy, workload, bad guys and politicians have a significant relationship with the SVI model. This suggests that making police administrators, oversight boards, politicians, and the public aware of the working nature of undercover police work might be pursued in order to reduce noise in the system and make the officer's work perhaps a little more efficient and less dangerous. If an officer has to think about going before a review board because of letting a small fish go in order to get a big fish, or if an officer has to endanger officers and a potential arrest of a large fish by making several small time arrests just to fill a quota, noise may end up causing bad decisions and bad or less than optimal outcomes.

According to the descriptive analyses, the bureaucracy and workload reduce the noise of the information received, while bad guys and politicians contribute to the noise at the decision making level. These findings are expected as the bureaucracy is designed to correct the errors within its own hierarchical system; work-load, including investigations, attempts at clarifying the cases; politicians may intervene in an ongoing investigation in accordance with their rationale of maximizing their utility; and bad guys are always targeting defects in law enforcement's attention in order to maximize their success.

Regarding the credibility element, only the variables about the socializing of police officers with each other, the requirement of undercover policing to have different approaches, the differences of undercover policing from routine policing, the emphasis of undercover policing in details and sense of unity, and the sense belonging among undercover police officers have a significant relationship with the police information processing SVI model.

According to the analyses, the greater degree of socialization of undercover officers among themselves and the difference between undercover policing and routine policing, including the different approaches involved in undercover policing, both have a positive association with the SVI information processing model. But, the emphasis on the details and strong sense of unity among undercover officers does not have a positive effect on the efficiency of the SVI information processing model.

All of these results support my hypothesis since the socialization among undercover officers facilitates information sharing. The differentiation and different approaches may be necessary features. The nature of undercover policing differs from that of routine policing. Emphasis on details may also increase the noise efficiency, and the sense of unity may narrow the perspective leading to a decrease in the efficiency of the output.

Regarding the experience element, only the variables about the education level, greater experience in the undercover profession, the requirement of undercover policing to adapt in accordance with the rapidly changing and mixing tasks, the involvement of juggling between multiple pieces of information in undercover policing, and the experience of working longer in the department have a significant relationship with the SVI model.

The analyses reveal that the education level of the respondents is really high. This is expected since the more highly educated people worked in more decision-making positions than

in practical positions, such as street cops, who have more of a chance and responsibility to arrest people than their decision-making colleagues. In addition, an increase in the requirement of undercover policing to adapt to rapidly changing and mixing tasks or an increase in the requirement of undercover police officers to juggle multiple pieces of information have an increasing impact on the SVI model. Assuming that adapting to rapidly changing and mixing information and juggling that information are both accelerated by experience and education, I conclude that these two indicators also reveal that experience has to be an element in the SVI model.

Regarding the combined effect of source and noise, the variables about trust in an informant, trust in an informant in the absence of other corroborating evidence, fitting in or passing for the bad guys, the undercover officers' families, undercover officers' language among themselves, review boards, and the intervention and understanding of the politicians have a significant relationship to the SVI model.

Finally, I conclude that the descriptive analyses support the existence of all four elements in the SVI model, as well as interactions between them to some degree. Hence, as a response to the first research question, my answer, based on the present research, is that it is possible to make use of models and concepts familiar to or drawn from the information sciences to construct a model of undercover police work that adequately and effectively represents the large number of entities and relationships. The data validate the social virtual interface model.

The answer to the second research question is that the analyses show that the constructed model has realistic implications. For example, the analyses show that what produces noise, credibility, sources and experience in undercover officers' information processing determines the efficiency of undercover police officers. The survey questions used to validate the SVI model

provide an idea about what constitutes source, noise, credibility and experience. An administrator utilizing the SVI model will know how to have an effective information source, how to reduce noise, how to increase credibility of information, and how to increase the experience in his/her agency, respectively.

From the practical and realistic point of view, the analyses about the information source element of the SVI model show that undercover law enforcement administrators need to exploit the benefits of technical surveillance and governmental records while reducing emphasis on the media as an information source. Furthermore, administrators need to know the benefits of the bureaucratic process while curbing the interventions of politicians.

The SVI model shows that it is beneficial in terms of reducing noise that reduces the value of information by contaminating it. Acknowledging the benefits of the hierarchy is particularly important in the contemporary management world. Knowing that beneficial side of a hierarchy, the undercover administrators could establish a balance between the benefits of vertical and horizontal hierarchical structures in their work environments.

In addition, the analyses about the SVI model show that politicians are important sources of noise. Hence, undercover administrators should provide a buffer zone between politicians and undercover business, in order to reduce the noise in that environment.

Undercover administrators should not complain about the work load since they reduce the noise in the information. Knowing such findings, the increased work load should be considered necessary to reduce noise but not an external load.

Regarding the practical conclusions about the credibility element of the SVI model, undercover administrators should be aware of what contributes to the credibility and what degrades the credibility of the information source. In other words, the undercover administrators

should encourage their personnel to socialize with each other in their spare time, and they should know that administration of undercover policing is different from routine policing and undercover officers have their own peculiarities since these peculiarities contribute to the credibility of information sources. On the other hand, administrators should discourage some sub-cultural traits such as being overly detailed, and having a very strong sense of unity that may promote unity and inclusion within the group but also creates a sense of exclusiveness and skepticism towards people outside of the group.

Regarding the practical conclusions of the experience element, undercover police administrators should know that information seeking and gathering in undercover work requires coping with rapidly changing and mixing tasks. In addition, having long-tenured personnel is important in order to improve the efficiency of the undercover police agency.

Future research can be conducted with more participants by having more observations to further validate the model. In addition, the SVI model may have more elements including cultural and sub-cultural factors. For example, confidence in an information source, in general, is a very important issue that may have a place in the SVI model. The undercover subculture is another important issue. If the subculture is an element in the SVI model, the model can be generalized to other disciplines including the military, law enforcement, academic settings, and so forth. In addition, further research may help model the interactions between the different elements of the SVI system and test them accordingly.

For more future research I suggest using the following:

- The same questionnaire conducted in United States may also be tested in different countries – Turkey, England, Germany – and the responses can be compared.
- The SVI model can be adapted to Game Theory to get a closer insight into the “good cop-bad cop” analogy.

- Furthermore, more quantitative analyses may be incorporated into the SVI model by asking questions about the output stage. I can apply Shannon's information theory to test the source and noise elements of the SVI model in terms of mathematical expressions.

It was not the intent of this research to suggest that the model itself answers any of the complex and highly controversial issues that always have arisen (and probably always will) between those who police and those who are policed. As David O'Connor states, "If anything, it better defines the complexity of the problem and better illustrates where many of the contentious issues originate. But there also was a great need within the police community itself for a model that clearly defined how the "process" of effective undercover police work proceeded. And the multitude of factors that can effect - either positively or negatively - that process." (personal communication, April 22, 2005). This dissertation represented a body of data and development of a viable model to help better and more clearly define the complex world in which the undercover police officer operates.

APPENDIX A
SAMPLE SURVEY

Sample survey

Thank you for taking your time to participate in our study. This survey is being conducted by Baris Aksakal, Graduate Student at the University of North Texas School of Library and Information Sciences. The purpose of this study is to understand and validate a model of information flow by police in the field; proposed model is a model of human information transformation from data to decisions. This survey will take approximately 20-40 minutes to complete. Participation is voluntary. If you give permission by completion of the survey, no individual responses will be reported to anyone and your responses will be strictly confidential. If you have any questions regarding this study, please contact candidate Baris Aksakal at (940) 595-1524 or Dr. Brian O'Connor, UNT School of Library and Information Sciences, (940) 206-1172. This project has been reviewed and approved by the UNT Institutional Review Board (940)565-3940. Please complete the questionnaire in its entirety.

Section One: Please select the most appropriate response for each statement. The questions in this section relate to demographic information.

Age: [18-24] [25-34] [35-44] [45-54] [55-64] [65 +]

Gender: [Male] [Female]

How long have you been working with the department?

[1-11 Months] [1-2 Years] [3-5 Years] [6-12 Years] [13 + Years]

What is the estimated population of your department's area?

[Less than 20,000] [20,001 to 50,000] [50,001 to 100,000] [100,001 to 250,000] [Over 250,001 residents]

Your jurisdiction: [State] [City] [County] Other:

Your department setting: [Rural] [Urban] [Suburban]

Please select the job title that best describes your current position:

[Commanding Officer] [Corrections Officer] [Sheriff] [Chief] [Commander] [Patrolman] [Officer]
[Trooper] [Ranger] [Training Officer and related personnel] [Captain] [Corporal] [Investigator] [Detective]
[Inspector]

[Other] Please specify:

How long have you been in this position?

[1-11 Months] [1-2 Years] [3-5 Years] [6-12 Years] [13 + Years]

Have you ever worked undercover in your profession?

[Yes-1-11 Months] [Yes-1-2 Years] [Yes-3-5 Years] [Yes-6-12 Years] [Yes-13 + Years] [No]

What is your education level: [High School] [Some College] [College Graduate] [Graduate School]

Section Two: Please select the most appropriate response for each statement. The questions in this section relate to your ideas and beliefs about undercover police work. Please answer the following questions based on the scale listed below.

Strongly Agree: [SA]
 Agree: [A]
 Mildly Agree: [MA]
 Mildly Disagree: [MD]
 Disagree: [D]
 Strongly Disagree: [SD]
 Unsure: [U]

- | | | | | | | | |
|-----------------------------------------------------------------------------------------|------|-----|------|------|-----|------|-----|
| Undercover police have strong attitudes and beliefs about the significance of their job | [SA] | [A] | [MA] | [MD] | [D] | [SD] | [U] |
| Undercover police form their own brotherhood | [SA] | [A] | [MA] | [MD] | [D] | [SD] | [U] |
| Undercover police tend to socialize with each other in their spare time | [SA] | [A] | [MA] | [MD] | [D] | [SD] | [U] |
| Undercover work requires more emphasis on details than other police work | [SA] | [A] | [MA] | [MD] | [D] | [SD] | [U] |
| Undercover police would prefer to live in a neighborhood where their colleagues live | [SA] | [A] | [MA] | [MD] | [D] | [SD] | [U] |
| Undercover police form their own world | [SA] | [A] | [MA] | [MD] | [D] | [SD] | [U] |
| Undercover teams have a strong sense of unity and belongingness | [SA] | [A] | [MA] | [MD] | [D] | [SD] | [U] |
| Undercover work is very different from routine police work | [SA] | [A] | [MA] | [MD] | [D] | [SD] | [U] |
| Undercover work is just the same as any other police work | [SA] | [A] | [MA] | [MD] | [D] | [SD] | [U] |
| Undercover police need to have different approaches than other police | [SA] | [A] | [MA] | [MD] | [D] | [SD] | [U] |
| Undercover police form their own community | [SA] | [A] | [MA] | [MD] | [D] | [SD] | [U] |
| Undercover police need to have a procedures checklist for handling situations | [SA] | [A] | [MA] | [MD] | [D] | [SD] | [U] |

Section Three: Please select the most appropriate response for each statement. The questions in this section relate to your ideas and practices concerning gathering information. Please answer the following questions based on the scale listed below.

Strongly Agree: [SA]
 Agree: [A]
 Mildly Agree: [MA]
 Mildly Disagree: [MD]
 Disagree: [D]
 Strongly Disagree: [SD]
 Unsure: [U]

I trust an informant	[SA]	[A]	[MA]	[MD]	[D]	[SD]	[U]
I trust an informant even when I have no other corroborating evidence	[SA]	[A]	[MA]	[MD]	[D]	[SD]	[U]
I trust an informant when I have a history with the informant	[SA]	[A]	[MA]	[MD]	[D]	[SD]	[U]
I trust an informant when another good source says he or she is dependable	[SA]	[A]	[MA]	[MD]	[D]	[SD]	[U]
The meaning of words that undercover police use in the office changes when the undercover officer is on the streets	[SA]	[A]	[MA]	[MD]	[D]	[SD]	[U]
Politicians interfere with good undercover work	[SA]	[A]	[MA]	[MD]	[D]	[SD]	[U]
Review boards get in the way of good undercover work	[SA]	[A]	[MA]	[MD]	[D]	[SD]	[U]
Legislators interfere with good undercover work	[SA]	[A]	[MA]	[MD]	[D]	[SD]	[U]
Politicians understand undercover work	[SA]	[A]	[MA]	[MD]	[D]	[SD]	[U]
Undercover police have to "think like the bad guy"	[SA]	[A]	[MA]	[MD]	[D]	[SD]	[U]
Understanding how words were used differently on the streets was a problem for me in the beginning of my profession	[SA]	[A]	[MA]	[MD]	[D]	[SD]	[U]
Undercover police have to fit in or pass for bad guys	[SA]	[A]	[MA]	[MD]	[D]	[SD]	[U]
The families of undercover cops understand and support their work	[SA]	[A]	[MA]	[MD]	[D]	[SD]	[U]

Section Four: Please select the most appropriate response for each statement. The questions in this section relate to your ideas about the processes involved in undercover work. Please answer the following questions based on the scale listed below.

Strongly Agree: [SA]
 Agree: [A]
 Mildly Agree: [MA]
 Mildly Disagree: [MD]
 Disagree: [D]
 Strongly Disagree: [SD]
 Unsure: [U]

- | | | | | | | | |
|-------------------------------------------------------------------------------------------------|------|-----|------|------|-----|------|-----|
| Undercover work is a simple (doesn't mean easy) process | [SA] | [A] | [MA] | [MD] | [D] | [SD] | [U] |
| Undercover work follows the same set of rules as general police work | [SA] | [A] | [MA] | [MD] | [D] | [SD] | [U] |
| Undercover work requires juggling between different bits of information | [SA] | [A] | [MA] | [MD] | [D] | [SD] | [U] |
| Information seeking and gathering in undercover work requires rapidly changing and mixing tasks | [SA] | [A] | [MA] | [MD] | [D] | [SD] | [U] |
| Undercover work has more gray areas than regular police work | [SA] | [A] | [MA] | [MD] | [D] | [SD] | [U] |
| Undercover work requires the evaluating and reevaluating of pieces of information | [SA] | [A] | [MA] | [MD] | [D] | [SD] | [U] |
| Making decisions without enough information is commonly done in undercover work | [SA] | [A] | [MA] | [MD] | [D] | [SD] | [U] |

Section Five: Please select the most appropriate response for each statement. The questions in this relate to how language is used in undercover work. Please answer the following questions based on the scale listed below.

Strongly Agree: [SA] Agree: [A] Mildly Agree: [MA] Mildly Disagree: [MD] Disagree: [D] Strongly Disagree: [SD] Unsure: [U]

- | | | | | | | | |
|---------------------------------------------------------------------------|------|-----|------|------|-----|------|-----|
| Undercover police have a distinct language or verbal communication | [SA] | [A] | [MA] | [MD] | [D] | [SD] | [U] |
| Undercover police have their own special meanings for regular words | [SA] | [A] | [MA] | [MD] | [D] | [SD] | [U] |
| Undercover police have to speak the same language as informers | [SA] | [A] | [MA] | [MD] | [D] | [SD] | [U] |
| Undercover team members have a language that only they would understand | [SA] | [A] | [MA] | [MD] | [D] | [SD] | [U] |
| Undercover police and bad guys are able to speak the same language | [SA] | [A] | [MA] | [MD] | [D] | [SD] | [U] |
| Undercover cops use their own language when talking to each other | [SA] | [A] | [MA] | [MD] | [D] | [SD] | [U] |
| Undercover police learn the language of the streets from their colleagues | [SA] | [A] | [MA] | [MD] | [D] | [SD] | [U] |

Section Six: Please select the most appropriate response for each statement. Please answer the following questions based on the scale listed below.

How often do you use the following in gathering information about a case or its suspects?

Always: [A]
 Usually: [US]
 Frequently: [F]
 Sometimes: [S]
 Rarely: [R]
 Never: [N]
 Unsure: [U]

Other undercover police officers	[A]	[US]	[F]	[S]	[R]	[N]	[U]
Departmental investigations	[A]	[US]	[F]	[S]	[R]	[N]	[U]
Informants	[A]	[US]	[F]	[S]	[R]	[N]	[U]
Criminal Case History	[A]	[US]	[F]	[S]	[R]	[N]	[U]
Technical surveillance	[A]	[US]	[F]	[S]	[R]	[N]	[U]
Other agencies	[A]	[US]	[F]	[S]	[R]	[N]	[U]
Media	[A]	[US]	[F]	[S]	[R]	[N]	[U]
Public records	[A]	[US]	[F]	[S]	[R]	[N]	[U]
Departmental records	[A]	[US]	[F]	[S]	[R]	[N]	[U]
Governmental records	[A]	[US]	[F]	[S]	[R]	[N]	[U]
Other -- Please list:							

Section Seven: Please select the most appropriate response for each statement. Please answer the following questions based on the scale listed below.

I find these sources reliable.

Always: [A]
 Usually: [US]
 Frequently: [F]
 Sometimes: [S]
 Rarely: [R]
 Never: [N]
 Unsure: [U]

Other undercover police officers	[A]	[US]	[F]	[S]	[R]	[N]	[U]
Departmental investigations	[A]	[US]	[F]	[S]	[R]	[N]	[U]
Informants	[A]	[US]	[F]	[S]	[R]	[N]	[U]
Technical surveillance	[A]	[US]	[F]	[S]	[R]	[N]	[U]
Criminal Case History	[A]	[US]	[F]	[S]	[R]	[N]	[U]
Other agencies	[A]	[US]	[F]	[S]	[R]	[N]	[U]
Media	[A]	[US]	[F]	[S]	[R]	[N]	[U]
Public records	[A]	[US]	[F]	[S]	[R]	[N]	[U]
Departmental records	[A]	[US]	[F]	[S]	[R]	[N]	[U]
Governmental records	[A]	[US]	[F]	[S]	[R]	[N]	[U]
Other -- Please list:							

Section Eight: Please select the most appropriate response for each statement. Please answer the following questions based on the scale listed below.

When working undercover to seek and gather information for a case, arrest, or on a suspect, how often do you do the following?

Always: [A] Usually: [US] Frequently: [F] Sometimes: [S] Rarely: [R] Never: [N] Unsure: [U]

Use a different way of speaking than I do normally	[A]	[US]	[F]	[S]	[R]	[N]	[U]
Use different words than I do in other aspects of my life	[A]	[US]	[F]	[S]	[R]	[N]	[U]
When undercover, encounter people who use language differently than I do	[A]	[US]	[F]	[S]	[R]	[N]	[U]
Find that working undercover has its own unwritten rules	[A]	[US]	[F]	[S]	[R]	[N]	[U]
Use different terminology with colleagues	[A]	[US]	[F]	[S]	[R]	[N]	[U]

Section Nine: Please select the most appropriate response for each statement. Please answer the following questions based on the scale listed below.

How often do you find the following to be barriers to information gathering or exchange?

Always: [A]
 Usually: [US]
 Frequently: [F]
 Sometimes: [S]
 Rarely: [R]
 Never: [N]
 Unsure: [U]

Laws	[A]	[US]	[F]	[S]	[R]	[N]	[U]
Regulations	[A]	[US]	[F]	[S]	[R]	[N]	[U]
Other officers	[A]	[US]	[F]	[S]	[R]	[N]	[U]
Bureaucracy	[A]	[US]	[F]	[S]	[R]	[N]	[U]
Politicians	[A]	[US]	[F]	[S]	[R]	[N]	[U]
Police review board	[A]	[US]	[F]	[S]	[R]	[N]	[U]
Bad guys	[A]	[US]	[F]	[S]	[R]	[N]	[U]
Informants	[A]	[US]	[F]	[S]	[R]	[N]	[U]
Police family	[A]	[US]	[F]	[S]	[R]	[N]	[U]
Supervisory officers	[A]	[US]	[F]	[S]	[R]	[N]	[U]
Bad guy's family	[A]	[US]	[F]	[S]	[R]	[N]	[U]
Structure of the department	[A]	[US]	[F]	[S]	[R]	[N]	[U]
Personal stress level	[A]	[US]	[F]	[S]	[R]	[N]	[U]
Chain of command	[A]	[US]	[F]	[S]	[R]	[N]	[U]
Inconsistent communication	[A]	[US]	[F]	[S]	[R]	[N]	[U]
Personal Safety	[A]	[US]	[F]	[S]	[R]	[N]	[U]
Work overload	[A]	[US]	[F]	[S]	[R]	[N]	[U]
Other -- Please list:							

Section Ten: Please respond to the following questions as indicated.

What factors can influence you in your information seeking and gathering?

How do you start your ground work to solve a specific task?

How do you search for and use your information sources for a specific case/assignment? Is there a pattern for this?

How do you interact with your information sources?

How do you match the expectations of your superiors with your ways of finding information?

What are your primary information sources for your work?

How do you gather information?

How did you learn to fit-in?

APPENDIX B
COPY OF IRB LETTER

UNIVERSITY^{of} NORTH TEXAS

Office of Research Services

January 18, 2005

Baris Aksakal
School of Library and Information Science
University of North Texas

Re: Human Subjects Application No. 04-413

Dear Mr. Aksakal,

As permitted by federal law and regulations governing the use of human subjects in research projects (45 CFR 46), the UNT Institutional Review Board has reviewed your proposed project titled "Makeshift Information Constructions: Validating the Social Virtual Interface (SVI) Model." The risks inherent in this research are minimal, and the potential benefits to the subject outweigh those risks. The submitted protocol and informed consent form are hereby approved for the use of human subjects in this study. **Federal policy 45 CFR 46.109(e) stipulates that IRB approval is for one year only.**

Enclosed is the consent document with stamped IRB approval. Please copy and **use this form only** for your study subjects.

It is your responsibility according to U.S. Department of Health and Human Services regulations to submit annual and terminal progress reports to the IRB for this project. Please mark your calendar accordingly. The IRB must also review this project prior to any modifications.

Please contact Shelia Bourns, Research Compliance Administrator, at ext. 3940 or Boyd Herndon, Director of Research Compliance, if you wish to make changes or need additional information.

Sincerely,



Scott Simpkins, Ph.D.
Chair
Institutional Review Board

P.O. Box 305250 • Denton, Texas 76203-5250 • (940) 565-3940
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REFERENCES

- Abadinsky, H. (2003). *Organized Crime* (7th ed.). Toronto, ON: Wadsworth/Nelson Thomson Learning.
- Aksakal, B. (2004, January). *Cops Under Cover: A Social Virtual Interface (SVI) for an extreme case of information flow*. Poster session presented at the ALISE Annual Conference, San Diego, CA
- Blair, D. C. (1990). *Language and representation in information retrieval*. New York: Elsevier North-Holland, Inc.
- Bowman, J., & Targowski, A. (1987) Modeling the communication process: The map is not the territory. *The Journal of Business Communication*, 24(4), 21-34.
- Burgin, Mark. 2003. Information: Problems, Paradoxes, and Solutions. *Cognition, Communication, Cooperation*, 1(1) 53-70.
- Chandler, D. (2000). *The transmission model of communication*. Retrieved March 2, 2005, from <http://www.aber.ac.uk/media/documents/short/trans.html#D>
- Chatman, E. A. (1986). Diffusion theory: A review and test of a conceptual model in information diffusion. *Journal of the American Society for Information Science* 37(6), 377-386.
- Chatman, E. A. (1991). Life in a small world: Applicability of gratification theory of information-seeking behavior. *Journal of the American Society for Information Science*, 42(6), 438-449.
- Chatman, E. A. (1996). The impoverished life-world of outsiders. *Journal of the American Society for Information Science*, 47(3), 193-206.
- Chatman, E. A. (1999). A theory of life in the round. *Journal of the American Society for Information Science*, 50(3), 207-217.
- Chatman, E. A. (2000). Framing social life in theory and research. *The new review of information behaviour research*. December 2000 (1), 3-17.
- Chen, H., Chung, W., Xu, J., Wang, G., Qin, Y., & Chau, M. (2004). Crime data mining: A general framework and some examples. *IEEE Computer*, 37(4), 50-56.
- Cline, A. (2000). Prioritization process using Delphi technique. *Carolla Development*. Retrieved on April 10, 2004 from <http://www.carolla.com/wp-delph.htm> (May 27, 2005).
- Creswell, J. W. (1998). *Qualitative inquiry and research design: Choosing among five traditions*. Thousand Oaks: Sage.

- Dalkey, N.C. (1969). *The Delphi method: An experimental study of group opinion*. Santa Monica, CA: The Rand Corporation.
- Denzin, N. K. (1978). *The research act: A theoretical introduction to sociological methods*. New York: McGraw-Hill
- Dervin, B. (1998). Sense-Making theory and practice: An overview of user interests in knowledge seeking and use. *Journal of Knowledge Management*, 2 (2), 36-46.
- Dintino, J., & Martens, F.T. (1983). *Police intelligence systems in crime control: Maintaining a delicate balance in a liberal democracy*. Springfield, IL: C. Thomas Publishing.
- Dreyfus, H., & Dreyfus, S. (1986). *Mind over machine*. New York: Macmillan.
- Fijnaut, C. & Marx, G., (1995). *Undercover: Police surveillance in comparative perspective*. The Hague: Kluwer.
- Flick, U. (1998). *An introduction to qualitative research*. London: Sage.
- Flick, U. (2002). *An introduction to qualitative research (2nd ed.)*. London: Sage.
- Gordon, T.J. (1994). *The Delphi method*. AC/UNU Millennium Project, Futures Research Methodology. Retrieved April 1, 2005 from www.rand.org.
- Hauck, R. V., Chau, M., & Chen, H. (2002) COPLINK: Arming Law Enforcement with New Knowledge Management Technologies. In W. McIver and A. Elmagarmid (Eds), *Advances in Digital Government: Technology, Human Factors, and Policy*. Kluwer Academic Publishers, April, 2002, pp. 163-179.
- Hayes, R. M. (1993). Measurement of information. *Information Processing and Management*, 29(1), 1-11.
- Huotari, Maija-Leena & Wilson, T.D. (2001). Determining organizational information needs: The critical success factors approach. *Information Research*, 6(3). Retrieved February 14, 2005 from <http://www.shef.ac.uk/~is/publications/infres/paper108.html>.
- Jorgensen, D. L. (2003). The methodology of participant observation. In M. R. Pogrebin (Ed.), *Qualitative approaches to criminal justice: Perspectives from the field* (pp. 17-26). Thousand Oaks, CA: Sage Publications.
- Linstone, H. A. (1978). The Delphi technique. In J. Fowles (Ed.), *Handbook of Futures Research* (pp. 273-300). Westport, CI: Greenwood Press.
- Maltz, M. D. (1996) From Poisson to present: applying operations research to problems of crime and justice. *Journal of Quantitative Criminology* 12: 3-61.
- McCarthy, B. (2002). "New Economics of Sociological Criminology." *Annual Review of Sociology* 28:417-42.

- Mick, U. (2003). *Introductory models and basic concepts: Shannon-Weaver*. Retrieved Apr. 16, 2005, from Communication, Cultural and Media Studies Infobase database: <http://www.cultsock.ndirect.co.uk/MUHome/cshtml/index.htm>.
- O'Connor, B.C., (1996). *Explorations in indexing and abstracting: Pointing, virtue, and power*. Englewood, CO: Libraries Unlimited
- O'Connor, B.C., & Copeland, J. (2003). *Hunting and gathering on the information savanna: Conversations on modeling human search abilities*. Lanham, MD: Scarecrow Press.
- Ramirez, A., Walther, J.B., Burgoon, J.K & Sunnafrank, M. (2002). Information-seeking strategies, uncertainty, and computer-mediated communication: Toward a conceptual model. *Human Communication Research*, 28, 213-228.
- Schubert, C. (2004). *Making interaction and interactivity visible on the practical and analytical uses of audiovisual recordings in high-tech and high-risk work situations*. Retrieved Jun. 23, 2005, from TUTS_WP_5_2002.PDF website: http://www.tu-berlin.de/~soziologie/tuts/Wp/TUTS_WP_5_2002.PDF
- Shannon, C.E., & Weaver, W. (1949). *The mathematical theory of communication*. Urbana: University of Illinois Press.
- Spradley, J.P., (1980). *Participant observation*. New York: Holt, Rinehart, and Winston.
- Terry v. Ohio, 392 U.S. 1 (1968).
- Wang, G., Chen H., & Atabakhsh, H., (2004). Criminal identity deception and deception detection in law enforcement. *Group Decision and Negotiation, Special Issues on Deception*, 13(2): 111-127, March 2004.
- Willmer, M. A. P. (1970). *Crime and Information Theory*. Edinburgh University Press, Edinburgh, Scotland.
- Wilson, P. (1973). Situational relevance. *Information Storage and Retrieval*, 9, 457-471.
- Wittgenstein, L. (1953). *Philosophical Investigations*. (G.E.M. Anscombe, Trans.). New York: The MacMillan Company.