
By

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This thesis is presented for the degree of

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DECLARATION

I declare that this thesis is my own account of my research and contains as its main contents work which has not previously been submitted for a degree at any tertiary education institution.

Nancy J Churchill
ABSTRACT

The current debate in police research is rich and multifaceted, focusing on such topics as fragmented contemporary police approaches to crime and disorder reduction. One crucial component of this debate is an epistemic one related to the preferred paradigm for police research. Another has to do with the level of theoretical inquiry and methodological pluralism needed to advance both the theory and practice of policing. Questions raised by both researchers and practitioners indicate concern with the rigour and relevance of police research as well as a growing consensus that a better alignment between research and practice is needed. A primary concern of this thesis is how to achieve that rigour, relevance, and alignment.

This study employs the Institutional Analysis and Development (IAD) framework and offers a research approach that closely aligns with practice. The Institutional Analysis and Development (IAD) framework has a rich history as a tool for theoretical inquiry in the social sciences, including political economics and public administration, but not as yet with policing. Epistemically the IAD framework goes beyond the scientific paradigm, recognising that knowledge is not derived from observation alone. It reflects that individuals are fallible learners and that trust, reciprocity, norms, and heuristics are important theoretical considerations (E. Ostrom, 2005).

Ontologically the IAD framework provides a hierarchical approach, with theory testing undertaken within the institutional framework through models designed to test specific questions. In this study, models tested the adequacy of rational choice and behavioural rational choice to explain collective action and collective choice. The study also inquired as to whether problem solving as reported in the policing literature could be explained as collective action and collective choice.

This research used the Institutional Analysis and Development (IAD) framework to model multiple, sequential collective action situations that had the potential to achieve call for service reductions in two Western Australia Police subdistricts. One model was endogenous (collective action situations with only police participants). The second model was exogenous (collective action situations involving police and nonpolice participants). The models were designed to allow police and nonpolice participants to
act dynamically and to engage in collective choice. The outcomes included significant reductions in calls for service and severity of calls in the two study subdistricts when compared to the entire district.

The study provided results at three levels: framework, theory, and model. From the research paradigm perspective, the IAD framework was used successfully to explore the collective choice behaviour of the police and the public, particularly with regards to reducing repeat calls for service. From a theoretical perspective, neither rational choice nor bounded rational choice explained the study results while the emerging behavioural theory of human action was more explicative. In addition, the study determined that collective action and collective choice were successful in reducing calls for service without the use of a proscribed problem solving model such as SARA (Eck et al., 1987).

The study has several strengths. First, the observed reductions in calls for service and call severity were outcomes from a methodologically rigorous and highly replicable design that aligned practice with research. The study’s theoretical inquiry into police and nonpolice behaviours provides a strong foundation for future research that uses theories extending beyond classical rational choice. By adopting an institutional perspective, the study reconciles some of the current fragmentation and confusion concerning contemporary police approaches. Finally and most important, the study provides a gateway to future police research using the IAD framework, the behavioural theory of human action, collective action, and collective choice.
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CHAPTER 1. INTRODUCTION

To understand institutions one needs to know what they are, how and why they are crafted and sustained, and what consequences they generate in diverse settings. Understanding anything is a process of learning what it does, how and why it works, how to create or modify it, and eventually how to convey that knowledge to others (E. Ostrom, 2005, p. 3).

A. The Current Climate of Policing Research

Policing is at a crossroads (Lum, 2014, p. 1) and policing research is as well. Lum, North American editor of the journal Policing, voices strong encouragement to police practitioners and researchers alike to advance the policing discipline through the forum offered by that publication. Her editorial is in response to the current academic debates on partnerships, approaches, and methodology and offers a quiet, mediated call to refocus on what is important. A great deal is at stake with respect to the issues being actively debated in policing. The most salient of these issues to the objectives of this research include:

- Fragmentation and competition amongst researchers in advancing particular contemporary police approaches, thus providing a confusing landscape for practitioners;
- Police not incorporating research into their operations, an observation by researchers and a strong topic of contemporary research inquiry and interest;
- Researchers undertaking research that may not be relevant, cost effective, or useful to police practitioners;
- The singularity of random control trials being offered, by some, as the preferred methodological approach for police research and being strongly opposed by others;
- The underlying quality of the research both as self assessed by researchers but also as viewed by those outside police research;
- The role of funding in driving the research agenda, and the fact that there is little funding to be had; and,
• Perhaps most significantly recognition that a new conceptual and analytical framework might have value in refocusing the research agenda of policing and allied disciplines.

In recent years these issues and related debates have resulted in strong interchanges between researchers, leading to increased polarization of the police research discipline. More fragmentation appears on the horizon as experimental criminologists, crime scientists, police scientists, and others form factions that all inevitably add to the tenor and richness of the general debate but do not necessarily always have constructive, time appropriate outcomes.

The most obvious issue is money. There either isn’t any, or what is available is vastly reduced from past times (Her Majesty's Inspectorate of Constabulary, 2013; Police Executive Research Forum, 2013). Little is available from governmental agencies or police organisations for policing research. Researchers have responded by turning inward: meta analyses of previous studies; (Braga & Weisburd, 2012b; L. Mazerolle, Bennett, Davis, Sargeant, & Manning, 2013; Weisburd, Telep, Hinkle, & Eck, 2010), literature reviews (Pearson-Goff & Herrington, 2014), a recasting of data from previously funded projects (Braga, Hureau, & Papachristos, 2014), and surveys exploring various aspects of police and their relationship, or lack thereof, to research (Grieco, Vovak, & Lum, 2014; Lum, Telep, Koper, & Grieco, 2012; McCarthy & O’Neill, 2014; Rojek, Martin, & Alpert, 2015). Police practitioners have responded by reducing staff and generally attempting to do more with less (Her Majesty's Inspectorate of Constabulary, 2014; O’Neill, 2014), including less integration of innovative programs (Gravelle & Rogers, 2011). Reduced funding has also translated to fewer funds for research. One researcher optimistically views this state of affairs as a positive opportunity. “[A]s once was said, allegedly, by Ernest Rutherford: ‘Gentlemen, we’ve run out of money. It’s time to start thinking’ – and that will hopefully be good for those wishing to promote experimentation” (Laycock, 2014, p. 8).

Meanwhile, reported crime decreases (Australian Institute of Criminology, 2013, p. iii; Federal Bureau of Investigation, 2013; Her Majesty's Inspectorate of Constabulary, 2013, p. 20), a phenomenon which policing researchers have been unable to explain from a policing perspective because of its complex dynamics (Blumstein & Wallman,
Nonetheless, policing research continues to study crime in isolation. Police practitioners, on the other hand, are dealing with a continued workload increase as measured by calls for service, a workload that is overwhelmingly not criminal (Greene, 2014, p. 203; Her Majesty's Inspectorate of Constabulary, 2013). This paradoxical relationship between decreasing crime and increasing police workload is a central concern of this research.

From a “front line” perspective, there is a limited capacity to undertake innovative efforts that do not specifically address the financial climate. Government responses to bridge the funding gap have included the UK Police Innovation Fund of £50 million, the awards for which have been heavily technology based (Home Office and the Rt Hon Mike Penning MP, 2014). In the United States, there is little discretionary federal funding available from traditional police sources such as the Office of Justice Programs (Office of Justice Programs, 2014). The National Institute of Justice has offered some discretionary funding for random control trials and research practitioner efforts (National Institute of Justice, 2014). The policy influence of some of the contemporary police approaches can be seen in the allocations of this limited governmental funding with evidence-based policing gaining an advantage in both the US and the UK in this regard. In the UK, the Home Office has provided direction by nominating evidence-based policing as the approach to be used to reduce crime (May, 2013, 2014). Meanwhile in the US, the Bureau of Justice Assistance and Police Executive Research Forum promote Compstat (Bureau of Justice Assistance & Police Executive Research Forum, 2013), the National Institute of Justice supports random control trials, aligned primarily with evidenced based policing, and Community Oriented Policing Services supports community policing and school resource officers (Office of Community Oriented Policing Services, 2014).

These funding limitations have spawned increased programmatic competition, including some unusually contentious debates in the literature. For example, those who support evidence-based policing’s random control trials are called “randomistas” (Sparrow, 2011). In the same article Sparrow (2011) provides a long, thoughtful critique of evidence-based policing while (Greene, 2014) dissects the medical model foundations of the approach. The Office of Community Policing argues that “problem-oriented policing, broken windows, intelligence-led policing, Compstat, third-party policing, and
hot spots, could be integrated into the community policing philosophy” (Scheider, Chapman, & Schapiro, 2009). Proponents of hot spots policing maintain that it “should be privileged” because it is evidence-based (Braga & Weisburd, 2010, p. 221). The jockeying for position appears to be connected to a quest for policy pre-eminence with the hopes that, if chosen, funding will follow (as it has in some cases). Sadly, this contention perpetuates confusion at the practitioner level. Which contemporary police approach has value, how it works explicitly, and which approach is best for which practitioner situation are all questions largely unanswered by the research. The answer at the moment is “all for everyone”, even though the vast majority of research has ignored the vast majority of police agencies, i.e. those that operate in suburban and rural locales (Cave, Telep, & Grieco, 2014). These approaches may or may not be relevant to them. We just don’t know. Because of it institutional perspective, this study is relevant to all locales be they suburban, rural, or urban.

In the face of this long term confusion, practitioners continue to resort to the traditional “benign neglect” approach. This approach includes appearing helpful while not actually implementing anything (Ortiz, Hendricks, & Sugie, 2007). It also includes practitioners’ reporting the use of the program du jour even though what was implemented may only be casually related to the original research (Coleman, 2008; Rojek, Alpert, & Smith, 2012). This is due to several factors. First, the original research is often so unclear about methodology that its replication is difficult in the best of circumstances, intelligence-led policing being but one of many examples (Hoggett, 2014). Second is that much overlap exists amongst the various approaches and the implementation steps are conveniently vague. This means that sometimes business as usual can qualify, e.g. targeting a high crime location one night equals “hot spots policing.” Working with community residents to solve this same problem is “community policing” and is also “problem-oriented policing”. If you are particularly clever, as police administrators often are, all of these can be “evidence-based” and “intelligence-led” as well. It is not surprising that when asked if they have implemented one of the many approaches, police practitioners very frequently answer “yes” even though they may be unclear about the approach (Rojek et al., 2012). Many clever practitioners then follow with a question of their own: will there be a grant available to fund more of their good work?
Third, police obtain most of their information about best practice research from police professional publications and government publications as opposed to directly from research journals (Nutley, Walter, & Davies, 2007; Cody W Telep & Lum, 2014). Thus by the time more rigorous research reaches the field, it not only is years later (Greene, 2014, p. 195) but often arrives at the practitioner’s doorstep in a mangled form. Finally in reporting “what works,” research occasionally shoots itself in the foot by exposing “what doesn’t,” for example the Campbell Collaboration systematic review of problem-oriented policing that determined only 10 studies of 5,500+ articles were sufficiently rigorous to be included in the review (Weisburd et al., 2010). This raises the provocative question, albeit unfair, about the credibility of the research of the other 5,490 studies. In another study, the Evidence-based Policing Matrix describes those parameters that appear to be more promising in reducing crime (Lum, 2009). However the categorisation of 92 research studies also indicated that a large number of studies had no effect or actually increased crime. Little guidance is provided to practitioners to help differentiate between what is “good” research and what is not. Thus from a police practitioner point of view, the definition of “good” research has become a simple one: that to which governmental funding is attached.

In summary, researchers have been researching and practitioners have been practicing, to a large degree without regard to one another’s endeavours (Bradley & Nixon, 2009). Researchers are frustrated by practitioners’ failure to integrate research into operations (Stanko, 2009). “Dialogue of the Deaf” (Bradley & Nixon, 2009), an article that described the research and practice disconnect, resulted in an entire special volume of Police Practice and Research: An International Journal (Volume 11, Issue 2, 2010). Responses included articles from leaders in both research and practice and expanded on the issues while also offering ideas for making progress. Part of the discussion has involved the perception that researchers were often seen to behave badly when working in the applied environment. In response, Cockbain and Knutsson (2015) provide a number of articles on how to approach that relationship in Applied Police Research (Brown, 2015; Greene, 2015; Kennedy, 2015; Laycock, 2015). Another part of the discussion has involved the observation by practitioners that research was not responsive to their operational needs (Buerger, 2010; Hoover, 2010), incomprehensible when provided (Rosenbaum, 2010), driven by the researcher’s funding driven agenda (Grieco et al., 2014, p. 4; Sparrow, 2011) or financially challenging, such as a recent
article advocating that police hire criminologists on their staff (Braga & Davis, 2014). To some degree this problem recapitulates the problem of money. As discussed above, funding often determines what is studied and how it is studied, as in the case of SMART Policing which among its mandates requires researcher/practitioner partnerships. Not unexpectedly, these forced partnership have had uneven success (Coldren, Huntoon, & Medaris, 2013).

Another concern related to the range of contemporary police approaches is the collective fragmentation and overlap (Greene, 2014, p. 215) as well as the lack of methodological clarity (Greene, 2014, p. 197). Without clarity research execution, theory testing, and predicting outcomes are a hit or miss affair, as is the interpretation of what approach does what and how. This issue manifests itself most critically in the various meta analyses intended to identify the best quality research about a particular topic such as problem-oriented policing (Weisburd et al., 2010), pulling levers policing (Braga & Weisburd, 2012a), hot spots policing (Braga & Davis, 2014), or evidence-based policing (Lum, Koper, & Telep, 2010). What these studies have also identified is that (a) a large number of studies in the study pool were not deemed rigorous enough to include and (b) of those included, not all demonstrated a positive change. The message is that much of what police research has on offer falls short (Weisburd et al., 2010, p. 14). That message, in addition to the fragmentation of approaches, does not make a compelling case to police practitioners to undertake an endeavour, in a very challenging environment, that might not deliver the goods (Sparrow, 2011).

All of this fragmentation, contention, friction, and lack of funding is not without its benefits. Thoughtful scholars have begun to analyse what is missing in the discipline, and what needs to change to improve it. The need for a new paradigm (framework), while originally offered to advance the position of evidence-based policing (Weisburd & Neyroud, 2011, 2013), has been recognised as a serious deficiency in the field by others. The most recent discussion involves considering the frameworks from other disciplines and in other ways than that advanced by Weisburd and Neyroud (Giblin & Burruss, 2009; Greene, 2014; Sampson, 2013; Sparrow, 2011). A framework for policing at the institutional level could offer hope in resolving the current fragmentation of approaches. The use of an institutional framework would, by definition, encourage
questions about the institution to be asked, as opposed to a researcher (or politician) preferred questions. Another observation is that the link between police research and theory is tenuous, overbroad, or missing altogether (Duffee & Maguire, 2007; Greene, 2014, p. 208). Theory is often used reflexively to explain what was observed, as opposed to being used predictively to explore what might be expected. The recognition of the role of theory in police research is growing (Cody W Telep & Lum, 2014). Theory testing of necessity requires modelling that, in a structured way, would improve methodology, replicability sustainability, and future study.

This framework, theory, and model testing approach is a conventional one in other social sciences but one which is applied by police researchers in a very limited way (Greene, 2014). For example, Sampson (2013) echoes this structure of framework, theoretical principals, and methodology in his article on the importance of place. The advantage of this research structure is that the theoretical question drives the methodology. The structure also allows for modification and retesting in a way that aids exploration and interpretation. The current debate about methodology has been quite heated and polarized as will be discussed more fully in Contemporary best practices in policing research methods (p. 81). The debate does appear to be trending towards methodological pluralism but only slowly (Greene, 2014, p. 217). Other social sciences, particularly those of economic and political economics from which the foundation theories of much policing research have come, incorporate methodological pluralism more as a matter of course and to good effect. This effect includes the development of other behavioural choice theories. One emerging is a more general behavioural theory of human action and the individual (E. Ostrom, 1998; 2014a, pp. 189-197; Poteete, Janssen, & Ostrom, 2010, pp. 220-232). Another with some longevity is prospect theory (Kahneman, 2011; Kahneman & Tversky, 1979). These theories, as well as others from behavioural economics, psychology, and a broader range of social sciences, are alien to the theoretical landscape of current police research.

Other social science disciplines have engaged in the epistemological debate as to what is knowledge, developing frameworks, theories, and models to support their inquiry. Their approach is often more ecumenical, particularly from a methodological perspective where methodological pluralism is encouraged. This research structure, i.e. hierarchically nested framework, theory, and model, leads us to other fields that have
had success with the approach. One field is political economics and the work of Elinor Ostrom and the Bloomington School. A key contribution of Ostrom and the Bloomington School has been the Institutional Analysis and Development (IAD) framework which will be discussed briefly below and more comprehensively in the *IAD Framework Overview* (p. 54). One opportunity presented by the use of this framework is the potential for recasting existing police research into a context where overlaps, complementarities, and consistencies can be identified and constructively resolved. The opportunity also exists to extend the level of theoretical inquiry and expand the methodological rigour of policing research.

Even with the fragmentation and frustrations, good work is being done. However, the future needs to be more about collaboration and cooperation, both within the research discipline and with practitioners. It also must recognise that police research would benefit from the work of other social science disciplines.

**B. Overview of the Study**

This study responds to the current issues in contemporary police research in the following way.

- Positioning the study from a macro institutional perspective as opposed to a micro perspective such as operational or tactical.
- Offering the Institutional Analysis and Development (IAD) framework as more epistemically and ontologically appropriate to the police discipline, as compared to the current debate recommending natural and physical sciences paradigms.
- Systematically assessing the content, issues, and theoretical bases, of contemporary police approaches and identifying (a) the theoretical bases of these approaches and (b) the commonality of problem solving amongst them.
- At the practical level, identifying an institutional problem identified by the police agency that is significant and also relevant broadly across other police agencies regardless of size.
• Defining a research methodology that juxtaposes the requirements of conducting high quality research with the practical considerations of the police agency, including such issues as utility and replicability of the research as well as funding.

This study undertakes this new exploration of policing in three ways. First is the application of the IAD framework to policing as an institution. Second is the investigation of foundation social science theory that underpins contemporary police research. This theoretical investigation will extend the current police research use of social science theory beyond an historical criminology focus and apply that theory to understanding the behaviour of police officers. Third is the inquiry into problem solving, specifically the phenomenon of shallow problem solving, as a tool for animating the institutional analysis. The scope of the study includes policing in Australia, the United State and the United Kingdom (England and Wales). The research is conducted in two subdistricts of the Western Australia Police.

1. Policing as an institution.

Policing is identified as an institution both through the language of the IAD framework as well as in the police profession itself. “Institutions are human constructed constraints or opportunities within which individual choices take place and which shape the consequences of their choices” (McGinnis, 2011a). Ostrom states that the term institution “refers to many different types of entities, including both organizations and the rules used to structure patterns of interaction within and across organizations” (E. Ostrom, 2010a). Shepsle describes institutions as (1) game forms and (2) equilibria. His discussion of institution-as-equilibrium versus institutions-as-constraints is important in that the former allows for the prospect of defection (Shepsle, 2006), which is, to a large degree, what policing is intended to address. Police scholars and practitioners regularly refer to policing as an institution in a more general way and often within the context of the criminal justice system, an overarching polycentric institution.

As an institution, policing is not evolutionary or adaptive. It is robust.

The larger the range of changes in context for which the institution continues to induce more or less the same equilibrium behavior, the more robust it is. It may
exhibit this robustness because the outcomes it produces prove acceptable in a wide range of circumstances. Then again, it may be robust because the institution is very hard to alter, with the transaction costs of change exceeding the benefits of change (Shepsle, 2006, p. 10).

The process of effecting change in robust institutions is particularly complex because they are not designed to be adaptive or evolutionary. Unfortunately, the slow pace of change of the policing institution, and with many of the police organisations within that institution, is often attributed by researchers and the public to intransigence and cultural resistance by the police. An alternative view, and the one proposed for use in this research, is that the robustness of the policing institution in the US, UK, and Australia that has resulted in a stable, monolithic, and sustainable, albeit sometimes frustrating institution to outsiders, is far more desirable than a fragile one.

One important reason for the investigation of the police institution is that it has several extraordinary characteristics. First is the robustness. Second are the powers of arrest and discretion granted to the police. Third is that policing exists as an institution in large part to deal with institutional defectors. The question is: Will these extraordinary institutional characteristics result in behaviours that align with the IAD framework, or not?


![Figure 1. The IAD Framework: Simple Schematic (E. Ostrom, 2005, p.13)](image)

The thesis of this study is that research frameworks with economic and social science traditions have the potential to enhance police research and that the application of these frameworks, with associated theories and methodologies, can improve the practical application of policing research. This study specifically explores the application of one such framework to policing, the Institutional Analysis and
Development (IAD) framework (Figure 1). It also explores the use of behavioural choice theory that has emerged from collective action research using the IAD framework.

While the IAD framework has been applied to a range of empirical settings (E. Ostrom, 2005), it has yet to be applied to the institution of policing. Blomquist and deLeon (2011) discuss how diversification of the IAD framework into other issue areas is crucial, a view supported by E. Ostrom (2011). The IAD framework endeavours to investigate complex human behaviour in a structured way, providing theoretical tools for the investigation of social science dynamics from an institutional and significantly more complex perspective (E. Ostrom, 2005). Developed by the Vincent and Elinor Ostrom Workshop in Political Theory and Policy Analysis at Indiana University, Bloomington, the IAD framework not only provides a conceptual framework but connects that framework to practice. The IAD framework is an ontological framework used to organise empirical research (Poteete et al., 2010, p. 233). It facilitates inquiry into theoretical questions within an applied setting. It is first, and foremost, intended to be used practically to understand real life institutions and behaviours within those institutions.

3. Theoretical basis.

In describing behaviours, much of police research is underpinned by rational choice theory. However, institutional inquiry has identified significant limitations with the theory. An attraction of rational choice theory is that it is simple, elegant and decisive (E. Ostrom, 2005, p. 103). A criticism of the theory is that it is simple, elegant and decisive... in a world that is complex, messy, and uncertain. This observation as well as fundamental critiques of the assumptions of the theory have resulted in some easing of the basic assumptions and loosening of the theory (Martinelli, 2010, p. 253). Bounded rational choice theory is the primary choice theory that has evolved with this easing and loosening. However even with these modifications, the theoretical limitations of rational choice are not eliminated. The problem is that when rational choice models are operationalised, they often fail to predict outcomes (E. Ostrom, 2010a, 2010b). “There are simply too many findings, in too many contexts, which do not support the assumption [of self interest, which is at the core of rational and bounded rational choice theories]” (Frohlich & Oppenheimer, 2006, p. 258). As Ostrom observes, the “grave
hesitation of some theorists to adopt ‘more realistic’ assumptions stems, to a large extent, from the messiness of the alternative superstructures” (E. Ostrom, 2005, p. 103). An approach to move forward is to recognise the value of rational choice theory but as only one of many models in a family of models (Poteete et al., 2010, p. 221). Ostrom’s body of work has addressed the disconnect between rational choice theory and empirical findings in game theory, economics, and her study of the Commons (E. Ostrom, 2005). Her work has also offered an emerging theoretical explanation that has been advanced under emerging titles such as a general behavioural theory of human action (Poteete et al., 2010) and behavioural rational choice (McGinnis, 2011a).

This study will investigate rational choice theory, bounded rational choice theory, and the emerging behavioural theory of human action. This study will also explore theory from two perspectives. This first is endogenously. “Endogenously” refers to the policing organisation and how the police engage in collective action and collective choice wholly within that organisation. The second is exogenously. “Exogenously” refers to how the police engage in collective action with those outside the policing organisation. These “others” can be community members (both criminal and non-criminal), government agencies, businesses, and a host of others.

4. **Problem solving.**

The contemporary police approaches do overlap. An important component of this overlap is that almost all contemporary police approaches have, as a unifying theme, a strong element of problem solving. This study will explore that unifying theme of problem solving in *Contemporary policing approaches and theoretical bases* (p. 20) and will also capitalise on that common theme for use in the research design. Because problem solving is a significant element of most contemporary police approaches, this study will use problem solving as a means of animating the institutional analysis of policing. Specifically, a phenomenon entitled “shallow problem solving” as described by Braga and Bond (2008) is used. Shallow problem solving refers to a less than full implementation of the SARA problem solving model (Eck et al., 1987) while significant results were observed nonetheless. This phenomenon is of practical interest to police practitioners. Thus, it provides a relevant topic of inquiry for exercise of the IAD framework. A more fulsome discussion of the phenomenon and its study relevance will be developed in *Problem Solving* (p. 49). In order to theory test, this research utilises
repeat calls for service, an institutional problem that has been previously identified by the study police organisation and that also is relevant to the contemporary police approaches and research.

5. **Contemporary policing approaches.**

Policing is awash in competing approaches produced from police research. During this time of great change, some historical policing approaches have survived and other new approaches have emerged. Policing stalwarts such as community policing, problem-oriented policing, and broken-windows policing continue to be the topic of research questions, often as meta analysis studies. Other approaches that constitute the most popular of reforms are pulling levers policing, third-party policing, hot-spots policing, Compstat, and evidence-based policing (Herbert, 2007). These all will be explored more fully in *Contemporary policing approaches and theoretical bases* (p. 20). Also to be included will be more recent models such as Intelligence-Led Policing and SMART Policing, an initiative of the US Department of Justice, Bureau of Justice Assistance. These approaches have been selected because they are most frequently referred to by researchers themselves. Other approaches exist, e.g. zero tolerance, but are less well known or less well studied. Other thematic topics of contemporary police research inquiry also exist, such as procedural justice and police legitimacy. This study will explore only those approaches that have a close link to police operations, from a practitioner perspective, and that have a strong problem solving element. In summary, these approaches include:

- Broken Windows Policing
- Community Policing
- Compstat
- Evidence-Based Policing
- Hot Spots Policing
- Intelligence-Led Policing
- Problem-Oriented Policing
- Pulling Levers Policing
This study will refer to all the above as “approaches.” The term “approach” is used specifically because there is inconsistency amongst all when referenced against the epistemological and ontological foundations of IAD, particularly the framework – theory – model theoretical tool distinctions (McGinnis, 2011a, p. 170). Some contemporary approaches have stated theoretical bases, others have inferred theoretical bases, and others have neither. Some are methodological but that methodology may be either practitioner focused, like Compstat, or research focused, like evidence-based policing. Of note is that all have a significant element of problem solving.

6. Practical policing considerations.

This is a time of great change for policing. Extraordinary environmental factors need to be considered in the design of the research methodology. The impact of terrorism and the heroic police budget reductions in the United States and United Kingdom (and less heroic but nonetheless substantial reductions in Australia), have resulted in a retrenchment to a more traditional, reactive policing approach (Kim & de Guzman, 2012; Murray, 2005; Ortiz et al., 2007). Counter intuitively, the crime rate continues to drop in all countries (Australian Institute of Criminology, 2012; Federal Bureau of Investigation, 2013; Office for National Statistics, 24 April 2014). While crime rate is the predominate measure of performance for most police agencies, particularly those in the United States, its relationship to overall police performance is tenuous at best (Boettke, Palagashvili, & Lemke, 2013, p. 420; E. Ostrom, Parks, Whitaker, & Percy, 1978, p. 382). And while crime and violence dominate both the practical and scholarly discourse of policing, the reality is that most police work is not criminal. For example, the Western Australia Police calls for service are predominantly non-criminal. This means that research and practitioner resources are focused on crime and violence problems, which are serendipitously declining, while the non-criminal workload continues to grow unexamined and unchecked. Realigning research and practice to also address the non-criminal workload of police, a theme of this thesis, may improve the understanding of how resources could be allocated more effectively to achieve allied outcomes.
Policing research efforts have been sufficiently disparate in terms of their focus and relevance that the concept of practice-based evidence has been mooted. “Practice – based evidence shares the basic idea with evidence-based practice that policy and practices should be directed by theoretical constructs and systematic evidence; however, the difference is that ‘practice’-based evidence is collected from routine practice and not from artificially constructed research studies” (Boba, 2010, p. 123). This study will approach its methodological development from both a research and practice perspective, including the use of calls for service as a key measurement.

C. Research Statements

Figure 2 provides a pictorial representation of the preceding discussion and research statement connections. The IAD framework provides for inquiry into the policing institution. The theoretical inquiry of the study involves rational choice, bounded rational, and the emerging behavioural theory of human action. Models have been designed to test these research statements in a field environment.

![Figure 2. Research Statement Schematic](image)

The specific research statements are:

- To determine whether the IAD framework can be used to explore the behaviour of the police and the public in collective-choice social dilemmas
- To determine how rational choice theory, bounded rational choice theory, and the emerging behavioural theory of human interaction describe the
observed behaviour of police in an endogenous collective-choice social dilemma (amongst police officers)

- To determine how rational choice theory, bounded rational choice theory, and the emerging behavioural theory of human interaction describe the observed behaviour of police and public in an exogenous collective-choice social dilemma (between police and the public)
- To determine whether collective action and collective choice explain the observed phenomenon of “shallow problem solving.”

D. Justifications of the study

The results of this study have important implications in three areas: theoretical, methodological, and practical

1. Theoretical justification of the study.

This study will contribute to the literature on rational choice, bounded rational choice, and the emerging theory of rational behaviour. It will do this by observing two collective-action social dilemmas: one amongst the police only and one between the police and public.

A specific contribution will be to investigate the behaviour of the police in terms of the aforementioned theories. It will do this by investigating the behaviour of police in a collective-action social dilemma within the police organisation. The first test will be whether collective action does occur. The second is, if it does, is it sustainable as an informal, independent activity within the police organisation? The third will be whether rational choice, bounded rational choice, or the emerging behavioural theory (or none) explains the observed behaviour.

Another specific contribution will be to investigate the behaviour of police and public in a collective-action social dilemma and describe the theoretical implications of the observed behaviour.
2. **Methodological justification of the study.**

This study will contribute to the literature on both institutional analysis and development as well as policing. First, while the IAD framework has been used to analyse a number of institutions, policing has not been one of them. Policing is of particular interest as an institution because of its extraordinary characteristics: (a) it is hard to alter, (b) the police have extraordinary powers, and (c) the policing institution exists in large part to deal with defectors. These three characteristics will hypothetically stretch the competency of the IAD framework in that it has to date been used to analyse more “normal” institutions and situations such as land boards, coffee cooperatives, common-pool resource settings, day care centres, and metropolitan services. Policing may be too robust and bureaucratic to allow for collective-action to occur although Ostrom has hypothesised that even in very bureaucratised institutions, there is room for collective-action to occur (E. Ostrom, 2005).

Second, a number of contemporary policing approaches exist that do not have a unifying conceptual framework. The result has been confusion at the practitioner level as to how to proceed. The IAD framework has the potential to contribute to the development of a research approach that is more practical in its outcomes and more structured in its inquiry.

3. **Practical justification of the study.**

Problem solving for police has primarily been the execution of the SARA problem solving model (Eck et al., 1987). The model is structured and precise in its expectations. That structure is rarely followed and the level of precision rarely achieved (Braga, 2010a). Observations are that the time requirements to execute the SARA Model, the lack of transformation of the results into practice, as well as the competing demands for officer time make implementation of Problem-Oriented Policing difficult (Rickman, Stewart, & Dimitrov, 2013, p. 5). Nonetheless, the SARA Model endures.

E. **Outline of the Study**

This thesis consists of five chapters. This introductory chapter provides a broad overview. The second chapter will review the existing literature and expand on the subjects introduced in the *Introduction*. Chapter 3 describes the research design,
methodology, data collection and procedures, and the analysis methods. Chapter 4 presents the results. Chapter 5 is a discussion of the results, significant findings, and recommendations for future research as well as a conclusion.

F. Chapter Summary

This chapter has outlined the methodological, theoretical, and practical aspects of the study at an introductory level. It has also presented the current climate in police research to help position this work. It has identified issues and opportunities for institutional analysis and policing research and refined the scope of this study to:

- Australia, United States, and United Kingdom (England and Wales) policing
- Investigation of the Institutional Analysis and Development Bloomington approach in relationship to the police institution
- Inquiry into the application of rational choice theory, bounded rational choice theory, and the emerging behavioural theory of human action in the police institution
- Inquiry into collective action, collective choice, and problem solving.
CHAPTER 2. LITERATURE REVIEW

A. Introduction

The research broad questions or themes to be explored in this thesis are:

- Whether the IAD framework can be used to explore the behaviour of the police and the public in collective-choice social dilemmas
- How rational choice theory, bounded rational choice theory, and the emerging behavioural theory of human interaction may be used to describe the observed behaviour of police in an endogenous collective-choice social dilemma (amongst police officers)
- How rational choice theory, bounded rational choice theory, and the emerging behavioural theory of human interaction may be used to describe the observed behaviour of police and public in an exogenous collective-choice social dilemma (between police and the public)
- Whether collective action and collective choice explain the observed phenomenon of “shallow problem solving.”

The Literature Review juxtaposes two primary disciplines in response to these statements.

First, this chapter reviews the contemporary policing approaches and the recent literature related to them. One subtext of this review is identifying the theoretical basis of each approach as well as any common element(s) amongst them. Problem solving proves to be thematically consistent across all the approaches. Problem solving and, in particular, the observed phenomenon of “shallow problem solving” present a specific opportunity for inquiry that this study targets. The Contemporary policing approaches and theoretical bases section is organised to identify the fragmentation of these approaches but also to recognise their value. Specifically, if framework(s) can be identified that coordinate these approaches and the future research related to them, the opportunities for complementarity and cooperation present themselves.
Next, the Institutional Analysis and Development framework is reviewed. The IAD framework offers a potential tool for addressing some of the police research issues identified. It facilitates research at the institutional level, which is a level different from much of police research. The focus of this section is specifically on those aspects of the framework that are relevant to this study’s inquiry into the collective action and choice aspects of problem solving. Topics include action arenas, action situations, social dilemmas, and rules, all of which are key elements of the research design. The IAD framework discussion also presents the literature on collective action, collective choice, and face to face communications in more detail since these concepts are important to the study.

The following section reviews the current theories as stated in the literature as the bases for the police approaches. These theories are primarily rational choice and bounded rational choice. Known limitations of these theories are presented. This section also discusses criminological theories that are derived from the rational choice, such as deterrence theory. The objective of the section is to clarify the depth of the theoretical connection to the contemporary police approaches and to identify current issues with this connection. Also discussed is the emerging general behavioural theory of human action which begins to address some of the limitations of rational choice theory.

The final review is of methodological issues. First, is a discussion of those methodological issues in relationship to police research. Next, is a broader discussion of the issues from the perspective of best practices in social science. The last subsection reviews applied research considerations, from the police organisation’s perspective. This applied aspect is a current and highly published topic in police research.

B. Contemporary policing approaches and theoretical bases

This section of the Literature Review involves a survey of contemporary policing approaches, particularly from the perspective of their framework, theory, and modelling. The term “approach” is used specifically to reflect that the use of police research language does not differentiate along these three parameters. Reviewing each approach with a focus on its structural, theoretical, and investigative components provides the baseline for understanding uniqueness, contentiousness, or complementarity with other police approaches and with the IAD framework. A number of meta analyses of the
research associated with each of these approaches has been undertaken, particularly through the Campbell Collaboration and will provide the basis for several of the sections including pulling levers, hot spots policing, and problem oriented policing. The contemporary police approaches included in this Literature Review are:

- Broken Windows Policing
- Community policing
- Compstat
- Evidence-based Policing
- Hot Spots Policing
- Intelligence-Led Policing
- Problem-Oriented Policing
- Pulling Levers Policing
- SMART Policing
- Third Party Policing

These approaches are provided as single entities because they have been advanced by scholars and practitioners alike as such. Some more recent work has begun to recognise that there are overlaps, or at least potential for shared characteristics, both between some policing approaches themselves as well as with non-policing approaches (Willis, 2011; Wolf, 2012).

1. **Problems of language in social science and police research.**

The terms framework, theory, and model have specific meanings within the context of the IAD framework.

**Framework** identifies, categorizes, and organizes those factors deemed most relevant to understanding some phenomenon.

**Theory** posits general causal relationships among some subsets of these variables or categories of factors, designating some types of factors as especially important and others as less critical for explanatory purposes.
Model specifies the specific functional relationships among particular variables or indicators that are hypothesized to operate in some well-defined set of conditions (McGinnis, 2011a, p. 170, emphasis in original).

These are utilitarian terms, hierarchical and nested. Frameworks identify the elements of institutional analysis and use a metatheoretical language. Theories provide for specifying which elements of the framework are relevant to a question and for making broad working assumptions. Models “make precise assumptions about a limited set of parameters and variables” (E. Ostrom, 2005, p. 28).

Known problems exist in the social sciences with language both intra and interdisciplinary, including that the three terms “are used almost interchangeably by diverse social scientists” (E. Ostrom, 2005, p. 27). This is not a police research problem but a broader one. However, in order to tease out the elements of the following police approaches, it is necessary to focus on the language of these approaches in order to provide a working standard. For example, a recent article about broken windows simultaneously refers to the approach as a theory and a paradigm (Wicherts & Bakker, 2014). For this Literature Review, the above definitions will be used with the one addition being that the term “paradigm” is considered synonymous with “framework.”

Another point of confusion is the theoretical basis of many of the contemporary policing approaches. A few refer to mainstream theories. Others refer to foundation theories that, on occasion, may not even exist. Others are silent about their theoretical connections. When a foundation theory has been stated in the literature, it has been adopted. When a foundation theory is referred to in the literature and it exists in the literature, it is identified as “inferred” and the approach is discussed on this basis. Approaches without theoretical foundations are categorised as appropriate, e.g. “model” when the approach rises to that level as described above.

2. Broken windows policing.

The seminal article for broken windows was published in the Atlantic Monthly and addressed the significance of police order-maintenance activities (J. Q. Wilson & Kelling, 1982). The term “broken windows” is described by its author as a “metaphor” (Sousa & Kelling, 2006, p. 78). In their subsequent book on the subject Kelling and
Coles (1996, pp. 242-243) describe broken windows as a strategy with four elements: dealing with disorder and low-level offenders, high police visibility, citizen control of public spaces, and integration of other agencies and institutions. A crucial component of the approach is “disorder” as defined by “incivility, boorish and threatening behavior that disturbs life, especially urban life” (Kelling & Coles, 1996, p. 14). Disorder behaviour is also frequently non-criminal behaviour, recapitulating the observations and opportunities discussed in Practical policing considerations (p.14).

The primary studies investigating the relationship between disorder and more serious crime do not provide overwhelmingly supportive results. These studies are also few in number. R. B. Taylor (2001, 2006) defines the approach as incivilities reduction policing and concludes that the theoretical and empirical research support is limited. Another study testing a theory of social cohesion found that the relationship between public disorder and crime is “spurious” except for robbery (Sampson & Raudenbush, 1999). One significant study conducted by Wesley Skogan (1992) found a significant relationship between disorder and perceived crime. A subsequent reanalysis of the data, including removal of some neighbourhoods from the original data set, reported no significant difference (Harcourt, 1998). A response to Harcourt’s findings was that the reanalysis did not disprove Skogan’s findings but identified a sensitivity to outliers in the data (Eck & Maguire, 2006). Harcourt has responded with a full book treatment in defence of his original criticism.

My starting point is the simple but startling fact that, decades after its first articulation in the Atlantic Monthly, the famous broken windows theory has never been verified. Despite repeated claims that the theory has in fact been “empirically verify[ied]” (Kelling & Coles, 1996, 24), there is no reliable evidence that the broken windows theory works. In fact, the existing social-scientific data suggests that the theory is probably not right (Harcourt, 2009, p. 8).

Harcourt makes observations including identifying broken windows’ sharing the same theoretical roots as mass incarceration and the theory of incapacitation (Harcourt, 2009, p. 11). He also points out that the mechanisms of broken windows may not be the “fixing” of broken windows but the closer proximity brought on between police and community.
A recent Campbell Collaboration “Title registration for a review proposal: Broken Windows Policing to Reduce Crime in Neighborhoods” discusses the question:

In New York City, for example, it is unclear whether broken windows policing can claim any credit for the 1990s crime drop (Eck, 2006; Karmen, 2006) with evaluations reporting significant reductions in violent crime (Corman & Mocan, 2005; Kelling & Sousa Jr), modest reductions in violent crime (Messner et al., 2007; Rosenfeld, Fornango, & Rengifo, 2007) and no evidence of reductions in violent crime (Harcourt & Ludwig, 2006). These conflicting results have generated questions on the crime prevention value of dealing with physical and social disorder (Braga & Welsh, 2012, p. 2).

The registration identifies broken windows as an “intervention” with a strong problem solving element.

In summary, broken windows policing has an inferred though not specific problem solving component and no specific theoretical basis.

3. **Community policing.**

Community policing, also known as community-oriented policing (COP), is arguably the most popular of all the contemporary police approaches. The three main elements of community policing are: community engagement/partnership, problem solving, and organisational transformation (Fridell, 2004a; Office of Community Oriented Policing Services, 2012). In a 1997 US survey by the Police Executive Research Foundation, 100% of those agencies surveyed with populations of greater than 100,000 reported implementing community policing (Fridell, 2004b). The depth of implementation was, however, “relatively modest” and “the implementation of internal organizational aspects of COP have outpaced the adoption of most forms of citizen participation” (Cordner, 2004, p. 65). Skogan also identifies the difficulty in achieving the pervasive organisational changes and identifies that many police agencies have implemented community policing “on the cheap” (Skogan, 2004, p. 162).

In *Innovations in Policing* (Weisburd & Braga, 2006), the advocacy and criticism of community policing are provided respectively by Wesley Skogan and Stephen Mastrofski. As an advocate, Skogan (2006) describes community policing as an
organizational strategy that leaves setting priorities and achieving them to residents and
the police. He defines the three crucial elements as community involvement, problem
solving, and decentralization. How these are implemented by residents and police is
unclear. Even Skogan as an advocate questions whether community policing can
survive accountability management especially when “…measured accomplishments get
attention and unmeasured accomplishments do not” (Skogan, 2006, p. 41).

Conversely, as critic Mastrofski (2006, p.44) describes the “all-things-to-all-people”
appeal of community policing precisely because it is ambiguous and flexible. Sherman
refers to the “flabby” content of community policing and its politically appealing label
in comparison to Goldstein’s “muscular conceptual framework” (Sherman, 1991, p.
692). Others also point to the difficulties in defining what community policing, exactly,
is (Eck & Rosenbaum, 1994; Greene & Mastrofski, 1988; Weisburd & Eck, 2004).
Mastrofski further observes that the longevity of community policing is a result of the
political viability that characterizing approaches with attractive names but non-specific
outcomes. Because the approach has not narrowed its focus over time, conducting
rigorous inquiry into its merits is problematic (Mastrofski, 2006).

Over the past two decades there has been a major investment on the part of the
police and the public in community policing. Because community policing
involves so many different tactics, its effect as a general strategy cannot be
directly evaluated. Some community policing strategies appear to reduce crime,
disorder, or fear of crime. Many others have not been found to be effective when
evaluated (National Research Council, 2004, p. 232)

The National Research Council recommended that as opposed to evaluating community
policing as an approach in its entirety, that it be broken down by researchers for
component evaluation instead (Mastrofski, 2006; National Research Council, 2004).
The conclusion is that structural changes have not occurred through community
policing, but that the rhetoric has altered (Mastrofski, 2006, p. 65).

Weisburd and Eck (2004) reviewed a broad range of research related to the elements of
both traditional and community policing. Their findings suggest that community
policing without a problem-oriented approach may reduce citizen distrust but may not
achieve reductions in crime and disorder. Also troubling, however, was the lack of
quality research on many policing tactics. The conclusion was that a systematic review of community policing was required and was subsequently completed (Gill, Weisburd, Telep, Vitter, & Bennett, 2014).

The resulting Campbell Collaboration review concluded the “findings are overall ambiguous” (Gill et al., 2014, p. 1). The review included 65 reports and 65 independent tests and “sought to investigate the extent to which community-oriented policing impacts crime, disorder, fear of crime, citizen satisfaction with police, and police legitimacy, as well as identify the most effective strategies police can use in collaboration with the community to prevent crime” (Gill et al., 2014). Most of the reports reviewed were from technical publications as opposed to journals. The authors raise questions of what outcomes should be expected as well as the dynamics associated with those outcomes, because the mechanisms for same are not obvious with COP.

Nonetheless, if we consider the potential mechanisms by which crime prevention might be achieved directly through COP, it makes sense that a systematic process of collaborative problem solving should be more effective than the police simply talking to citizens (even though that may have beneficial effects on other outcomes) (Gill et al., 2014, p. 22)

The authors then call for the development of a logic model in which various variables and outcomes can be investigated. They also identify that there is “no clear theory of change” (Gill et al., 2014, p. 22). The authors’ recommendations for future research are along the lines of producing a non-linear model to allow for testing the various elements and mechanisms of the community policing approach and to provide an implementation map of best practices for police departments.

In summary, while problem solving is a key element of the approach, no theoretical basis is directly attributable to it.

4. **Compstat.**

The peer reviewed literature concerning Compstat begins to appear in early 2000 with predecessor practitioner literature also discussing the approach which won the prestigious *Innovations in American Government Award.* (Also, please note that various authors vary the capitalisation: Compstat, CompStat, and COMPSTAT). The
former is used here with the exception of direct quotes). Defined as “a goal-oriented strategic management process that uses technology, operational strategy and managerial accountability to structure the delivery of police services and provide safety to communities” (Walsh, 2001, p. 347). A hallmark of the approach in New York was weekly crime control meetings the intent of which was to improve the flow of information as well as ensure accountability, the emphasis being strongly on accountability (Moore & Braga, 2003; O’Connell, 2001; Walsh, 2001). In the first year three fourths of the precinct commanders were replaced (Heskett, 1996). The publication of a book describing the implementation process (McDonald & Greenberg, 2002) was met with favourable reviews for the process description but critiqued for the lack of statistical evidence that it improves on other police management systems (Mesloh, 2002).

The ensuing discussion reflected this dichotomy: was Compstat truly a police innovation or just another operational model and, most important, was it effective and in what way (Firman, 2003; Kania, 2004; Walsh & Vito, 2004; Weisburd, Mastrofski, McNally, Greenspan, & Willis, 2003)? Weisburd et al. consider Compstat in the framework of strategic problems solving and conclude that elements of strategic problem solving had predated the emergence of Compstat and, thus, that any gains observed might be more attributable to problem solving than to Compstat. Another issue, and one which raised much ensuing discussion, was whether Compstat was adopted more enthusiastically by the police as a way of preserving the traditional hierarchical model of the police organisation (Magers, 2004; Weisburd et al., 2003). Outcomes analysis of Compstat made it unclear as to whether a reduction in crime could be attributed to Compstat and, even if it were argued that Compstat was effective, which aspect was the causal link (Rosenfeld, Fornango, & Baumer, 2005). Others argued the approach had significant weaknesses in due process, community relations, leadership, and problem solving (Eterno & Silverman, 2006).

While there is general consensus in the literature that problem solving is an integral component of Compstat, it was only in 2007 that the theoretical inquiry was introduced. Willis et al. use three case to review Compstat in light of the technical/rational and institutional models of organisations and conclude that institutional theory might provide the better explanation. Willis et al. also point out that while the components of
Compstat have been identified, the dynamics are untested and not well understood (Willis, Mastrofski, & Weisburd, 2007). More recent articles have explored community policing and Compstat synthesis (Willis, 2011; Willis, Mastrofski, & Kochel, 2010) as well as improvements to its problem solving component which is primarily reactive (Bond & Braga, 2013).

In summary, the literature on Compstat is silent on its theoretical basis. The approach has a strong problem-solving component.

5. Evidence-based policing.

The lack of program evaluation using scientific standards and methodologies was raised in two seminal articles targeting respectively practitioners and researchers (Sherman, 1998; Sherman et al., 1997). In answer to the question about what works and what doesn’t work in crime prevention and a review of 500 programs through 1996, the conclusion was “that there is minimal evidence to establish a provisional list of what works, what doesn’t, and what’s promising. (Sherman et al., 1997, p. 1). The subsequent call for more rigor in police research resulted in several outcomes.

One was coining of the term “evidence-based policing” as titled in Sherman’s (1998) Police Executive Research Forum article. The term was drawn from the “evidence-based medicine” approach (Sherman, 2004, p. 159) approach and the need to produce rigorously researched, replicable studies as being discussed in medicine at the time (Chalmers, 2003). The tying of medicine and police research continues to manifest itself in arguments related to increased funds for police research (Weisburd & Neyroud, 2011). The emphasis is on empirical research and scientific validity (Welsh, 2006).

The next outcome was, indeed, an increased awareness about what constituted evidence and the research expectations associated with getting it. Two centres of expertise were created/identified: the Center for Evidence-Based Crime Policy at George Mason University (US) and the Institute of Criminology at Cambridge University (UK). The US centre works to identify research that is evidence based and assisting practitioners to apply it (Braga & Davis, 2014; Lum, 2009; Lum, Koper, & Telep, 2011; Willis, 2013).

The Cambridge work has distinctly emphasized the use of experimental methodologies (Sherman, 2004), with an increased emphasis on randomised control trials (Ariel, Vila,
Current projects include Crim-Port, a criminological protocol of randomised trials, as well as a registry of randomised trials in criminology for police ("Experimental Criminology @ Cambridge," 2014). This emphasis on randomised trials is a current topic of debate in the field of police research and more fully discussed in *Contemporary best practices in policing research methods* (p. 81). This latter section highlights the current methodological debate of which the evidence-based proponents are at the centre.

A third outcome has been the identification of an “implementation gap” and increased interest in police/research partnerships. Academic research is inherently removed from the day to day operational aspects of police service delivery (Weisburd & Neyroud, 2011). As such, a bridge is needed between research and practice to reflect the benefits of synchronicity between the two (Buerger, 2010). This is a thematic aspect of this thesis as discussed in *Contemporary policing approaches* (p. 13) and *Practical policing considerations* (p. 14). The topic was explored in a special issues of Police Practice and Research: An International Journal which devoted itself to these evolving practitioner/researcher relationships (Cordner & White, 2010). Braga and Davis suggest that one way to bridge that gap is add criminologists to police department staffs (Braga & Davis, 2014). A comprehensive study of 90 police practitioners with research partnership experience concluded that there were a number of benefits to the police agency (Hansen, Alpert, & Rojek, 2014). Thus, the discussion of building police/researcher partnerships has been a major, continuing focus of the approach.

Evidence-based policing has evolved in some aspects as a methodological, as opposed to a theoretical, approach. There is an inferred problem solving association because many of the studies that intend to be evidence-based have significant problem solving components (Weisburd, 2008; Weisburd, Telep, Hinkle, & Eck, 2008).

### 6. Hot spots policing.

One definition of “hot spots” is “that a hot spot is an area that has a greater than average number of criminal or disorder events, or an area where people have a higher than average risk of victimization” (Eck, Chainey, Cameron, Lietner, & Wilson, 2005). The term is used to refer to: address ((Eck & Weisburd, 1995; Sherman, Gartin, & Buerger, 1989), intersection (Braga et al., 1999), blocks (R. B. Taylor, Gottfredson, & Brower,
1984; Weisburd & Green, 1995), clusters (Braga & Bond, 2008), and clusters of blocks (Block & Block, 1995). A current hot spot suggestion is that micro level programs are best focused on street segments (the two block faces on a street between two intersections (Braga, Hureau, & Papachristos, 2011; Groff, Weisburd, & Yang, 2010; Weisburd, Groff, & Yang, 2014, p. 31; Weisburd, Morris, & Groff, 2009). Another interesting definition of “hot spot” has been schools (Kautt & Roncek, 2007). Taylor observes that this is a “core conceptual confusion” in the approach (R. B. Taylor, 2010, p. 272). The confusion results in difficulties with transforming theoretical definition into operational terms, and the conflict between rigid boundaries and the realities of more fluid social norms (Buerger, Cohn, & Petrosino, 1995, p. 237).

Several theoretical foundations have been advanced as to why focusing on “place” as opposed to “person” is advantageous in crime prevention. “Routine activities approach” suggests analysing the dynamics of crime rates by concentrating on the circumstances in which predatory criminal acts are committed versus emphasizing the characteristics of offenders (L. E. Cohen & Felson, 1979). Cohen and Felson argue that by making structural changes in three elements, crime rates can be influenced: “(1) motivated offenders, (2) suitable targets, and (3) the absence of capable guardians against a violation” (L. E. Cohen & Felson, 1979, p. 589). In this same article, Cohen and Felson observe that the adequacy of many theories of crime “is evaluated by cross-sectional data, or no data at all” (L. E. Cohen & Felson, 1979, p. 604). Ironically what the authors offer as an “approach” and “framework” (L. E. Cohen & Felson, 1979, p. 591) appears very quickly thereafter in the criminological literature as “theory.”

Criminological theory has had to react to studies that indicated that criminals do not offend at the same frequency or severity, and that crimes are not distributed evenly through a geographic area. One study indicates that crime does not occur randomly in space, revealing “substantial concentrations of all police calls, and especially calls for predatory crime, in relatively few ‘hot spots’” (Sherman et al., 1989, p. 38). The authors conclude that the regulation of the routine activities of places is a far simpler task than the regulation of the routine activities of persons and suggest that a “criminology of place would seem to offer substantial promise for public policy as well as theory” (Sherman et al., 1989, p. 49). As compared to other contemporary police approaches were the amount of literature could only be characterised as sparse, a large
number of studies have involved inquiry into the hot spots approach (Braga et al., 1999; Caeti, 1999; Sherman et al., 1995; Sherman & Weisburd, 1995; Weisburd & Green, 1995). More recently the problem-oriented policing, evidence-based policing (random control trials), and hot spots policing approach have been used as a combined approach to inquiry (Braga & Bond, 2008).

A series of Campbell Collaboration systematic reviews have generally indicated that the approach can be effective (Braga, 2001, 2012a; Braga, Papachristos, & Hureau, 2012). In the most recent article, several opportunities are discussed. The first is the need to understand the police-community relationship aspects of the approach. Second is the potential unintended consequences including a high level of arrests, straining the local judicial system, and subsequent significant increase in fugitive defendants (Goldkamp & Vilcica, 2008). A final recommendation is for formal cost-benefit assessments which were universally missing from the studies reviewed.


The study of crime events at places is influenced and supported by three complementary theoretical perspectives: rational choice, routine activities, and environmental criminology. The importance of focusing police resources on crime hot spots is also informed by the ‘broken windows’ thesis on the relationship between disorder and more serious crimes (Braga & Weisburd, 2010, p. 67)

The authors also discuss crime pattern theory as a useful complement to routine activities theory in studying the hot spots approach. In contrast Rosenbaum (2006) indicates that while the importance of place can certainly be considered through these theories, but that “hot spots policing, in practice, is not so sophisticated and reflects a basic deterrence model (Rosenbaum, 2006, p. 250).

In his review of the book, Tilley (2012) offers the notion of “hot spots” as only one aspect of the larger situation problem-oriented policing. In a more robust response to a broad based implementation proposal for a US national program to develop and test hot spots policing (Mastrofski, Weisburd, & Braga, 2010), Taylor argues a number of concerns:
1. Hot spots do not exist in the real world. To believe they do is to commit the logical fallacy of reification.

2. The most important abstract quality of hot spots may not be that they are hot spots. To believe so is to commit the logical fallacy of misplaced concreteness.

3. There is no set definition of the policies and procedures that constitute HSP [hot spot policing]. We know where this places police, but no consensus has emerged about what police do next. In short, there may not yet be a coherent set of policies, procedures, practices and strategies most would agree represent the core of HSP.

4. Advancing HSP as a national policing policy over and above other plausible initiatives is at best premature (R. B. Taylor, 2010, p. 271). Taylor observes that what characterises a large number of hot spots implementations is aggressive enforcement, with the unintended consequence of reducing procedural justice particularly in communities of colour. His conclusion is that “[e]mbracing HSP may mark another step in American policing’s retreat from reform .... The reforms intended initially to create co-produced-public safety and increase police responsiveness (E. Ostrom, Parks, Whitaker, et al., 1978); (E. Ostrom & Whitaker, 1973) ended up doing just the opposite” (R. B. Taylor, 2010, p. 275).

Hot spots policing refers to a number of theoretical bases including Rational Choice Perspective, Routine Activity Theory, Crime Pattern Theory (Environmental Criminology). It has a strong problem solving component.

7. **Intelligence-led policing.**

Intelligence-led policing “involves effectively sourcing, assembling and analysing ‘intelligence’ about criminals and their activities better to disrupt their offending, by targeting enforcement and patrol where it can be expected to yield the highest dividends” (Tilley, 2011, p. 375). The impetus for the approach is to a large degree the result of the National Intelligence Model (NIM) in the UK where it was implemented (Tilley, 2011), as well as in New Zealand (Darroch & Mazerolle, 2013; J. Ratcliffe, 2005), Australia (J. Ratcliffe, 2003) and the US (Carter & Carter, 2009).
The precise definition and methodological steps of intelligence-led policing are unclear. J. Ratcliffe (2003) observes the general assumption “that the term speaks for itself, and definitions are rare” (J. Ratcliffe, 2003, p. 2). This lack of precision is comparable to community policing where the practical implications of the approach are unclear, particularly in relationship to police agencies’ mission, structure, and processes (McGarrell, Freilich, & Chermak, 2007). Some practitioners align the approach closely with problem-oriented policing, indicating that the SARA methodology (Eck et al., 1987) is used (J. Ratcliffe, 2003). “Intelligence-led policing can be closely associated with problem-oriented policing (Goldstein, 1990) in that they are both tactics that can support a broader policing paradigm such as community policing” (J. Ratcliffe, 2003, p. 5). Others indicate a close association with evidence based practice (Maguire & John, 2006). Carter and Carter (2009) argue that Intelligence-led policing (ILP) “is a complementary expansion of the community policing concept” (Carter & Carter, 2009, p. 310) while Bullock (2013) observes that the two are “somewhat conceptually distinct” (Bullock, 2013, p. 40). Another view is that the intelligence-led policing approach is the same as Compstat (J. Wood & Shearing, 2007). As various approaches are confused or merged with intelligence-led policing, the conclusion is that a clarifying definition might helpful (J. Ratcliffe, 2011).

In his book length treatment of the topic, J. Ratcliffe (2011) attempts to provide that definition and proposes the following:

Intelligence-led policing is a business model and managerial philosophy where data analysis and crime intelligence are pivotal to an objective, decision-making framework that facilitates crime and problem reduction, disruption and prevention through both strategic management and effective enforcement strategies that target prolific serious offenders (J. Ratcliffe, 2011, p. 89).

As a policing philosophy, its significant traits are that: “it is managerially centered and top-down in decision-making format; it is proactive; it is informant and surveillance-focused with heightened attention directed toward recidivists and serious crime offenders, and it provides a central crime intelligence mechanism to facilitate objective decision making (J. H. Ratcliffe & Guidetti, 2008, p. 112). The general thrust of this approach is to establish intelligence-led policing as different from other approaches.
The direction of other academics and practitioners is in the opposite. Carter and Carter (2009) observe the conceptual and methodological ambiguity of intelligence-led policing. “Indeed, there is a movement toward the adoption of ILP without a universally accepted definition or operational philosophy” (Carter & Carter, 2009, p. 315). Their study proposes a homeland security perspective, placing intelligence–led policing within that context and integrating community policing and problem-oriented policing into that perspective (Carter & Carter, 2009). They also acknowledge that while there are differences between intelligence-led policing and Compstat, that there are similarities that will facilitate the implementation of intelligence-led policing.

Thus, intelligence-led policing finds itself as having practitioner prominence but existing in something of a “conceptual fog” which generally characterises the business of policing (J. Ratcliffe, 2011, p. 80). Ratcliffe observes that “[m]ore generally, there has been a lack of clarity in regard to policing paradigms and the frameworks by which academics and practitioners articulate their vision of how policing should function.” (J. Ratcliffe, 2011, p. 80). One study investigating the relationship between intelligence-led policing and changes in state law enforcement agencies concluded that observed changes were attributable more by “pragmatic interest in the utility of intelligence rather than a theoretically guided approach based on the principles or core works of ILP” (Schaible & Sheffield, 2012, p. 781). Tusikov (2012) states that intelligence-led policing “is a widely adopted but critically under-theorised and relatively unproven management strategy” (Tusikov, 2012, p. 100).

Intelligence-led policing as an approach does not have a stated theoretical basis but does appear to have inferred connections with community policing, problem-oriented policing and Compstat. There is strong problem solving component.

8. **Problem-oriented policing.**

In his 1979 *Crime and Delinquency* article, Herman Goldstein published the first in a number of articles and books about the need for policing to transition, through the use of problem solving, from a purely reactionary approach to one that was proactive (Goldstein, 1979). Thanks in part to Eck and Spelman’s recasting of the concept into the SARA problem solving model (Eck et al., 1987; Spelman & Eck, 1987), Goldstein’s conceptualisation of problem-oriented policing has spread widely within the policing
profession. The problem solving component is arguably one of the most recognised, accepted, and implemented approaches in US policing (Weisburd et al., 2010).

Most professional police officers are familiar with the concept of problem-oriented policing. What is less well recognised within the profession are some of the specific organisational and police legitimacy issues related to the proposed transition from a reactive to a proactive policing approach. The concept of problem solving is simple. Thus, the policing profession has tended to focus on the problem solving aspect of the concept without recognising or addressing its much broader institutional implications.

In his review of Goldstein’s *Problem-Oriented Policing*, Sherman identifies one of many of these broader system implications, i.e. integration. Reflecting on Goldstein’s comparison of then modern police to bus drivers who are too busy to stop for passengers because it would put them behind schedule, Sherman states:

> Failure to create a reliable system for assessing police results will mean a failure to institutionalize the importance of results themselves in American policing. If that happens, the basic goal of Goldstein’s strategy will be displaced, even with widespread adoption of the process. The police may again become bus drivers too busy to stop for passengers. The only difference will be a different model bus (Sherman, 1991, p. 706).

Goldstein himself touches on some of the institutional level issues facing the successful integration of the problem-oriented policing approach including the need to make organisational structural decisions (special unit or department wide), redefining the role of rank-and-file officers, decentralization, and revising performance criteria amongst others (Goldstein, 1990).

The findings of a Campbell Collaboration systematic review of problem-oriented policing and its effectiveness in reducing crime and disorder found systemic problems in the execution of problem solving, determining that only ten of 5,500 articles and studies met the inclusion criteria (Weisburd et al., 2010). Also observed was that the “portfolio of studies is at best serendipitous and does not represent any concerted public effort to either assess the effectiveness of POP as an approach or understand the mechanisms that would make it more successful” (Weisburd et al., 2010, p. 164).
Essentially, the study observed that there was an absence in the literature of evidence for the approach. The study concluded that there was a modest but significant statistically significant impact of problem-oriented policing on crime and disorder and characterised this as “overwhelmingly positive” (Weisburd et al., 2010, pp. 139-140).

Problem-Oriented Policing (Goldstein, 1990) describes more broadly the concept and implications of problem-oriented policing, and in it Goldstein discusses other aspects of policing and the implementation of problem-oriented policing that continue to be relevant today. They are relevant today because these concepts and implications reflect on policing as a system and also remain fundamentally unchanged from Goldstein’s time. For example, Goldstein discussed one of the fundamental conflicts of policing is that the most “awesome” powers were invested in the police but that these powers are “delegated to individuals at the lowest level of the bureaucracy to be exercised, in most instances, without prior review and control” (Goldstein, 1990, p. xii). This translates well into issues of police legitimacy that are contemporary.

The issues of authority and police legitimacy are crucial to the definition of a police systems model because they inherently define the scope of work for the police. What work is policing work and, by definition, the work in which police are authorised to engage? What work is not? One term introduced to describe the reactive policing model is “incident-driven policing” (Eck et al., 1987). This phrase describes a policing system where a call is placed to the police and the police respond. As such, and from the perspective of authority and legitimacy, the scope of work is clear and limited. Community members call for service. The police provide that service. “Incident-driven policing” continues to be a significant component of contemporary police work.

Goldstein’s concept, however, proposes that the police become proactive. This concept expects the police to identify and resolve problems that are not necessarily the result of a preceding incident, thus expanding the scope of “legitimate” police work but not necessarily in a way that requires prior review and control, either internal or external. And while the identification of a problem may be an innocuous police activity, the response to that problem may not. He articulates his thesis at the institutional level.

Change in a large bureaucracies grow out of a variety of developments, many of which are not predictable. It follows that change more often is a matter of
skillfully taking advantage of opportunities than systematically executing a detailed plan. An awareness of these dynamics, however, does not eliminate the need to consider how any single proposal will fit into the complex framework that is current-day policing. Nor does it eliminate the need to have in mind a coherent vision of the ideal arrangement for providing police services so that, despite the messy way in which change occurs, each change will move the agency a little closer to the achieving the ideal. Complex as it is to achieve significant, lasting change in a police organization, the chance of doing so is greatly increased if it is appropriately related to a larger scheme (Goldstein, 1990, p. 31).

The discussion in the policing discipline did not remain at the institutional level for long and, as result, full implementation of problem-oriented policing as presented by Goldstein is rare (Boba & Crank, 2008; Braga & Weisburd, 2006; Goldstein, 2003).

It is at this juncture that Goldstein’s version of problem-oriented policing with its original, robust systemic observations and arguments was diverted. That diversion involved the publication of the SARA Model (Eck et al., 1987) and the subsequent informal redefinition of problem-oriented policing as the use of the SARA Model (Goldstein, 2003; Knutsson, 2003). Problem-oriented policing examples began to bear little resemblance to Goldstein’s thesis (Clarke, 1998).

The Campbell Collaboration review used a specific study selection criteria that included “SARA Characteristics” (Weisburd et al., 2010, p. 148) and also states that while a study need not specifically have noted its use of the SARA model, that it was expected that the steps be generally followed (Weisburd et al., 2010, p. 146). The issue is that while Goldstein’s problem solving is somewhat amorphous and creative, the SARA Model is highly structured. This structure leads to incomplete implementation and, as observed, only 10 studies out of 5,500 meeting the level of rigor required for study inclusion.

In summary, while problem solving is clearly a component of this approach, the theoretical bases for the approach are unclear. Tilley and Scott (2012) observe that the various theories are underutilised with regards to the problem-oriented policing approach.
9. **Pulling levers policing.**

Pulling levers policing, also known as focused deterrence strategies (Kennedy, 1996), involves “deploy[ing] enforcement, services, the moral voice of the communities, and deliberate communication in order to create a powerful deterrent to particular behavior by particular offenders” (Kennedy, 2006, p. 156). The approach is strongly founded in rational choice theory. However, problems are observed when theorizing about the behaviour of offenders who make choices that, to most reasonable people, would be irrational. Committing a crime is in and of itself, by standard social norms, is an irrational act. Bounded rationale choice theory, where information is not complete, is likewise unable to address this issue of criminality (Kennedy, 2009).

Kennedy has added the dimension of “radical subjectivity” to explain the observed criminal behaviours (Kennedy, 2009, p. 23). In short, what might not be rational to you or I, may be perfectly rational to an offender. The proposition is that the offender may use a simpler and smaller frame of reference in his choice (Carroll, 1978, 1982).

In turn, these simpler strategies might allow for simple decision rules, what Phillip Cook called “rules of thumb” or “standing decisions”: basic personal tenets that obviate the need for continual assessments of particular situations and options” (Cook, 1980, as quoted in ; Kennedy, 2009, p. 22)

Thus, comes the introduction of rules and the notion that not everyone has the same rules for decision making. “One can be, according to this thinking, quite rational and at the same time quite wrong” (Kennedy, 2009). The next step in his theoretical evolution is to understand the “subjective response of offenders” to the “objective facts” (Kennedy, 2009, p. 23).

Kennedy (2009) raises many considerations for reframing deterrence.

- Understanding groups, networks and collectivities since offending often occurs within this context and have their own influential processes
- The role of messages, which has not been explored, as well as communication to individuals. networks and groups, and nonoffenders
- Norms, key standards, and “rules of thumb” from the perspectives of individual, peer and network, and community
- The notion of relationships amongst authorities, offender and offender groups, communities, and others

The use of information and face to face meetings is an important component of the approach, particularly the use of information as opposed to enforcement (Kennedy, 2009).

A Campbell Collaborate systematic review of selected deterrence approach studies observed statistically significant results in ten of the eleven (Braga & Weisburd, 2012b). The authors also observed the shortage of randomised control trial experiments in the literature pool, generally, and study group, specifically. The studies primarily dealt with serious and violent crime as well as drugs, a particularly challenging intervention target. Subsequent studies have shown some mixed effects. One study, using a combined problem solving and deterrence approach, achieved statistical reductions in non-violent offences but not in violent offences (Corsaro, Brunson, & McGarrell, 2013). Another indicates that suppression, e.g. arrests, may be a significant factor as opposed to focused deterrence as is envisaged (Corsaro & Brunson, 2013). One study inquires into the theoretical foundations of “pulling-levers” through interviews (Rivers, Norris, & McGarrell, 2012). Some literature on the approach has identified the need for strengthening an understanding of the theory and link to practice (Braga, 2012b; Rivers et al., 2012).

The pulling levers policing approach has rational choice theory, as modified by “radical subjectivity” as its theoretical foundation. The approach has strong problem solving characteristics.

10. **SMART Policing Initiative (SPI).**

The SMART Policing Initiative (SPI) was announced in September 2009 by the US Department of Justice, Office of Justice Programs, and the Bureau of Justice Assistance as an approach to achieve crime reduction and increased closure rates (Medaris & Huntoon, 2009). Two primary targeted strategies are offender-based and place-based (“hotspot”) policing with a focus on the replication of evidence-based practices. Other
elements of SPI include a mandatory requirement of police/research partnership including affiliation between a police organisation and a research institution as well as the use of the SARA problem solving model, as updated to reflect the evidence and research based underpinnings of SPI (US Department of Justice, 2013). The program eventually had 30 law enforcement agencies selected for funding during that five year period (CNA Corporation, 2009).

The program is described as a new policing paradigm that builds on the theory and research of community-oriented policing. It is also described as a problem-oriented policing approach that is derived from Goldstein’s work (Rickman et al., 2013). However Rickman et al. also observe that widespread implementation of problem-oriented policing is difficult to achieve because of the time consuming nature of the SARA problem solving model.

The SPI program has five key components:

- Performance measurement and research partnerships
- Outreach and collaboration
- Managing organizational change
- Strategic targeting, and
- Making better use of intelligence and other data and information systems (Bureau of Justice Assistance & CNA Incorporated, 2013a)

The program’s performance requirements are primarily process oriented. The key performance measures are:

- Revision of strategic plan
- Revision or implementation of a new tactical plan
- Number of trainings on evidence-based or data-driven topics
- Policies or standard operating procedures created or updated
- Data sources (CNA Corporation, 2013)
The performance reports review progress on these process measurements but are silent on outcome measure related to the stated program objective of crime reduction and increased closure rates (Bureau of Justice Assistance & CSR Incorporated, 2011, 2012, 2013).

An aspect of the program that is not readily apparent is the participation of many key researchers and institutions that have been instrumental in developing the range of other policing approaches previously discussed in this section. Thus, SPI had supported a diversity of approaches.

The results of the program have been uneven. Of the thirty sites, some have reported results in scholarly journals and/or the BJA web site. Other sites have been silent in this regard. Those reporting and their observations follow:

- A reduction in targeted convenience store crime in Glendale, Arizona (White & Balkcom, 2012; White & Katz, 2013)
- A retrospective quasi-experimental analysis of Boston Police Department’s Safe Streets Teams, establishing its crime control effectiveness (Braga, Davis, & White, 2012; Braga & Schnell, 2013)
- Observation of congruence between problem solving and positive property crime reductions in Lowell, Massachusetts (Bond, Hajjar, Ryan, & White, 2014; Bond & Hajjar, 2013)
- Evidence indicating a reduction in crime in the target area by intervening with violent repeat offenders and gang members who create crimes in that area of Los Angeles (Uchida et al., 2012)
- Description of staff increases and approaches used as a basis for increasing police legitimacy with immigrant communities in Palm Beach, Florida (White, Ainbinder, & Silva, 2012)
- Offender-focused strategy achieved crime reductions while foot patrol and problem-solving did not in Philadelphia targeted violent hot spots (J. Ratcliffe, Groff, Haberman, & Sorg, 2012; J. Ratcliffe, Groff, Haberman, Sorg, & Joyce, 2013)
Progress made toward reducing the availability of prescription drugs in the Reno area (Barthe, Venzon, Ward, & White, 2013)

The issues observed with the program to date, include the use of “smart” which is unclear. Coldren et al. (2013, p. 276) indicate a preferred uniformity of system operations, practices, values and goals such that the operationalising term results in distinct changes and that there is a common understanding of what, practically, the term means. Another concern is that researcher and practitioner collaboration has been uneven. Even in sites where a partnership existed, the result was not the development of an experimental or quasi-experimental design (Coldren et al., 2013, p. 280). Perhaps the most salient issue is expressed by James Stewart and is an overarching concern for all policing approaches that result from extraordinary funding: “The enduring question that needs to be answered is, ‘Can SPI be sustained once the grant money is exhausted?'” (Joyce, Ramsey, & Stewart, 2013, p. 366).

In summary, the literature on SMART policing is silent on its theoretical basis with the exception of the stated link to community policing theory. The approach has a strong problem-solving component.


The term third-party policing “describes police efforts to persuade or coerce nonoffending persons to take actions which are outside the scope of their routine activities, and which are designed to indirectly minimise disorder caused by other persons or to reduce the possibility that crime may occur” (Buerger & Mazerolle, 1998, p. 301). Third party policing practically involves the use civil law to achieve its disorder and crime reduction objectives. Buerger and Mazerolle discuss the persuasion and coercion characteristics of the model as well as the assumption that “persons will behave according to their basic instincts unless and until a subordinate power demands that they conduct themselves otherwise (Buerger & Mazerolle, 1998, p. 309) with that assumption aligning well with rational choice theory and bounded rational choice theory. The model is also characterised as an extension of problem solving initiatives that preceded it.
Third party policing is one of the few contemporary police approaches to offer a model (Figure 3). The model describes the formation between the police and external third party(s) of partnerships that involve coercive-collaborative partnership(s). The purpose of the partnership is twofold: crime prevention and crime control (L. Mazerolle & Ransley, 2005) and can target both crime and quality of life problems (Finn & Hylton, 1994). While the capacity exists for initiators other than police, the focus of third party policing has primarily involved police initiated activities. The partnership matrix (Figure 7) provides another layer of insight into partnership characteristics.

The next defining feature of the model is the application of a legal level, ultimately targeting individuals with deviant behaviour with the objective being a civil remedy involving sanctions and/or penalties (L. Mazerolle & Ransley, 2005).
coercive component is its potential use to engage and activate the third party. The model includes “consequences” for the implementation of the legal levers with ultimate outcome being a positive change in the crime problem.

This coercive aspect of the model has raised questions. Mazerolle and Ransley (2005) discuss adverse social consequences, displacement, or unintended effects on the co-opted tool or person. Other critical observations have involved the impact on civil liberty, racial equity, and the urban poor as well as questioning the cost and benefits of the approach (Desmond & Valdez, 2012; Meares, 2006).

The language in a recent article by Mazerolle (2014) has emphasised the partnership versus the coercive aspects of the model while also adding the aspect of long term impact as an outcome. Also incorporated is reference to Routine Activities Theory and the emerging theory of relational coordination as being theoretically consistent with the model. A recognised problem solving component is inherent in the model. However, the SARA approach (Eck et al., 1987) is noted as inconsistent with third-party policing since the interventions are dictated by regulatory law. Other evolutionary changes include the clear identification of Public Police (first party), Partners (third parties), and Problem People, Places or Situations (second parties). General police responses also complement the partnership and legal lever implementation.

![Figure 5. Third Party Policing Model (L. Mazerolle, 2014, p. 348)](image)

Julianne Webster (2013) has also emphasised the partnership aspects of third-party policing but presents third-party policing, in itself, as an intervention. The article also provides as a theoretical basis problem-oriented approaches, situational approaches, and routine activity approaches. The concluding implications of the study involving
police/pharmacy partnerships was that “...policing partnership models are complex and prone to weakness in their design” (Webster, 2013, p. 15). Most recently, a theoretical discussion of Third Party Policing using a truancy project as an example, concludes that police partnerships, particularly ones with third parties who have interest, regulatory levers, and a mandate, are crucial to long term success (L. Mazerolle, 2014).

In summary, the elements of third party policing as they relate to this study are the inferred rational choice and bounded rational choice theory foundations as evidenced by the focus on coercion/deterrence, the specified routine activities theory link, and the inclusion of problem solving.

12. **Summary of contemporary police approaches.**

Table 1 summarises the approaches and presents an expert definition. A review of only the definitions tends to confirm that fragmentation and redundancies exist amongst the approaches (Greene, 2014). Next, information about the *stated* theoretical basis for an approach is presented. This represent the theory articulated in a survey of relevant research articles and books. All the approaches have *inferred* theoretical bases but by being inferential, these bases are unclear. What is unifying thematically is problem solving, and this is very clearly exemplified in Table 1. Summary of Contemporary Approaches. It either is an inherent component of the approach itself or the literature describes it as important. For example, while the definition of Evidence-Based Policing does not clearly state a problem solving orientation, the current work as described in *Evidence-based policing* (pp. 28-29) makes that orientation clear.
<table>
<thead>
<tr>
<th>NAME OF APPROACH</th>
<th>DEFINITION</th>
<th>STATED THEORETICAL BASIS</th>
<th>SIGNIFICANT PROBLEM SOLVING COMPONENT</th>
</tr>
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<tbody>
<tr>
<td>Broken Windows Policing</td>
<td>&quot;a police emphasis on disorderly behavior and minor offenses, often referred to as &quot;quality of life&quot; offenses like prostitution, public urination, and aggressive panhandling&quot; (Sousa &amp; Kelling, 2006, p. 78)</td>
<td>Yes</td>
<td></td>
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<tr>
<td>Community Oriented Policing</td>
<td>&quot;a law enforcement philosophy that encompasses a range of policing strategies involving the community, such as community policing, neighborhood policing, and problem solving&quot; (Weisburd et al., 2012, p. 1)</td>
<td>Yes</td>
<td></td>
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<tr>
<td>Compstat</td>
<td>&quot;command accountability system that uses computer-mapping technology and timely crime analysis to target emerging crime patterns and coordinate police response&quot; (Bratton &amp; Malinowski, 2008, p. 259)</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Evidence Based Policing</td>
<td>&quot;Evidence-based policing is the use of the best available research on the outcomes of police work to implement guidelines and evaluate agencies, units, and officers. Put more simply, evidence-based policing uses research to guide practice and evaluate practitioners. It uses best evidence to decide what constitutes best practice. It is a systematic effort to parse out and codify unsystematic &quot;experience&quot; as the basis of police work, refining it by ongoing systematic testing of hypotheses.&quot; (Sherman, 2002, p. 226).</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>NAME OF APPROACH</td>
<td>DEFINITION</td>
<td>STATED THEORETICAL BASIS</td>
<td>SIGNIFICANT PROBLEM SOLVING COMPONENT</td>
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<tr>
<td>Hot Spots Policing</td>
<td>&quot;hot spots policing is the application of police interventions at very small geographic units of analysis&quot; (Braga &amp; Weisburd, 2010, p. 9)</td>
<td>Rational Choice Perspective, Routine Activity Theory, Crime Pattern Theory (Environmental Criminology)</td>
<td>Yes</td>
</tr>
<tr>
<td>Intelligence-Led Policing</td>
<td>&quot;a business model and managerial philosophy where data analysis and crime intelligence are pivotal to an objective, decision-making framework that facilitates crime and problem reduction, disruption and prevention through both strategic management and effective enforcement strategies that target prolific and serious offenders&quot; (J. Ratcliffe, 2011, p. 6)</td>
<td></td>
<td>Yes</td>
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<tr>
<td>Problem Oriented Policing</td>
<td>&quot;A proposal for incorporating greater concern for the end product of police work into efforts to effect change in the police was initially outlined in the 1979 article cited above and has since been referred to as ‘problem-oriented policing’ (Goldstein, 1990, p. 3)&quot;</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>NAME OF APPROACH</td>
<td>DEFINITION</td>
<td>STATED THEORETICAL BASIS</td>
<td>SIGNIFICANT PROBLEM SOLVING COMPONENT</td>
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<tr>
<td>Pulling Levers Policing</td>
<td>&quot;new problem-oriented policing framework to prevent gang and group-involved violence, generally known as “pulling levers” focused deterrence strategies. Focused deterrence strategies honor core deterrence ideas, such as increasing risks faced by offenders, while finding new and creative ways of deploying traditional and non-traditional law enforcement tools to do so, such as directly communicating incentives and disincentives to targeted offenders.&quot; (Braga &amp; Weisburd 2012, 5)</td>
<td>Deterrence Theory</td>
<td>Yes</td>
</tr>
<tr>
<td>SMART Policing</td>
<td>&quot;an emerging paradigm in American policing that stresses crime reduction and promotes improvement of the evidence base for policing. Smart Policing emphasizes effectively using data and analytics as well as improving analysis, performance measurement, and evaluation research; improving efficiency; and encouraging innovation&quot; (Coldren et al., 2013, p. 275)</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>Third Party Policing</td>
<td>&quot;police efforts to persuade or coerce nonoffending persons to take actions which are outside the scope of their routine activities, and which are design to indirectly minimize disorder caused by other person or to reduce the possibility that crime may occur. In practice, third-party policing invokes formal, noncriminal controls imported from the regulatory wing of civil law&quot; (Buerger &amp; Mazerolle, 1998, p. 301)</td>
<td></td>
<td>Yes</td>
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</table>
A primary thematic consistency amongst the contemporary policing approaches is problem solving. Problem solving is focus of this study as well, for two reasons. The first is so that this study is relevant and thematically consistent with other contemporary police approaches. The second is that the application of the IAD framework encourages theoretical questions to be asked through the application of models. These models need to be animated in some way. This study animates the models by examining collective action, collective choice and a phenomenon described as “shallow problem solving” (Weisburd & Braga, 2006, p. 145).

Formal problem solving efforts in policing have had uneven results (Weisburd et al., 2010). The majority of these problem solving efforts used the SARA model of problem solving (Eck et al., 1987), with SARA characteristics being an inclusion condition for the Campbell systematic review of the topic (Weisburd et al., 2010). One common concern is that the SARA Model is cumbersome to use in that it assumes the user must be specifically guided through a defined structure and process. As a result, applied research has often been unsuccessful in fully applying the model as designed (Bond & Hajjar, 2013; Braga & Weisburd, 2010; Braga et al., 1999). Many projects that originally intended for the SARA model to be used have observed practical uses that were, instead, “shallow” problem solving responses (Braga & Bond, 2008; Braga & Weisburd, 2006; Cordner & Bieber, 2005; Eck, 2006).

Weisburd and Braga (2006) do not define “shallow problem solving” other than to suggest it refers to weak problem analysis and something less than adherence to the SARA model (Eck et al., 1987). Eck himself playfully refers to it as “problem-solving ‘light’ ” (Eck, 2006, p. 128). Amongst other issues, Braga and Weisburd point to a policing culture that is resistant to such an in-depth approach as well as questioning the need for a relatively complex model for fairly simple problems. The suggestion is that shallow problem solving efforts should take place at the beat level with more complex problems addressed higher in the organisation with more sophisticated resources (Braga & Weisburd, 2006).

Other scholars observe similar issues with the use of SARA. The delivery of SARA in many cases is described as “rather desultory and formulaic” (Tilley, 2010, p. 186) and
not following “the linear and separate steps of the SARA model” (Braga & Weisburd, 2006, p. 134). Others note gaps or weaknesses in the application of SARA (Bond & Hajjar, 2013; Braga & Weisburd, 2006; Cordner & Biebel, 2005; Read, Tilley, & Britain, 2000). Braga (2010) identifies two randomised control experimental studies that use SARA and retrospectively observes that these studies documented what is “usually practiced in the field – ‘shallow’ problem solving characterized by weak problem analysis and limited response development” (Braga, 2010b, p. 176).

Two directions emerge from these discussions. One, is to improve the SARA model, replace it with an alternative and/or improve the ability of police agencies to implement problem solving (Braga, 2010a; J. Ratcliffe, 2011; Scott, 2000; Sidebottom & Tilley, 2011). The other direction is to recognise that while SARA may (or may not) be useful for large complex problems, that it has less utility for smaller problems that can be addressed by “ad hoc shallow problem-solving efforts that focus police on high-risk places, situations, and individuals” (Braga & Weisburd, 2006, p. 149), although the authors are unclear as to what these ad hoc efforts might be. Braga and Bond then test this hypothesis in random control trial (Braga & Bond, 2008). Officers used general policing disorder strategies, also not defined, and the study reports significant reductions in crime and disorder calls for service.

The difficulty for researchers is that these “shallow” problem solving efforts, which apparently are the majority of problem solving efforts reported, often achieved significant reductions in crime or calls for service (Braga & Weisburd, 2010). Also problematic is that no alternative explanation for this success has been offered. Braga and Bond (2008) attempted to test a more prescriptive shallow problem solving but it is unclear in their article as to the theory and model being tested. They do introduce the notions of general policing disorder strategies, situational strategies, and social service strategies but the definitions of these are likewise unclear. However, the study reports significant reductions in crime and disorder calls for service. In a more recent article analysing Compstat, Bond and Braga (2013) describe elements of a process that begins to look more like collective action and choice, although the underlying assumptions and theoretical attribution of their study are quite different.
The compelling question that arises from all this is if positive results are observed but police study participants have been using the SARA Model in a very suboptimal way (if at all), what is really going on?

Even practice-focused art forms like the Goldstein Awards of the Center for Problem-Oriented Policing require that accounts of action research projects be forced into a stylized schema (in this case the four-part ‘SARA’ – scanning, analysis, response, assessment – model), which can bear little relation to how the work actually occurred in reality (POP Center, 2013).

We thus have classic research conducted on police interventions, and often in partnership with the police, without much in the way of material that can shed light on how it all happened, why it did or did not go well, and what both researchers and police can learn from the experience (Kennedy, 2015, pp. 13-14).

Thus, the phenomenon of shallow problem solving provides an animating opportunity for this study’s modelling. It also provides an opportunity to explore, as described in this study’s fourth research statement: whether what is being observed as shallow problem can be explained by collective action and collective choice, as described in Collective action and collective choice, (p. 65).

D. Introduction to Institutional Analysis and Development

The work of the Bloomington School incorporates the inquiries of many participants and collaborators, including the career long inquiries of scholars Vincent Ostrom and Nobel Prize Laureate Elinor Ostrom. The Institutional and Development (IAD) framework is one of the primary contributions of these inquiries. This study proposes that the IAD framework has applicability to the policing institution, as stated in the first research statement. The exploration of this proposition requires an understanding, from the conceptual and theoretical perspective, of the preceding contemporary police approaches and the IAD framework, as well. Since the IAD framework has been developed to assist with institutional inquiry, it provides the generic basis for the design, with the research methodology of this study crafted using it. However the extent of the literature on the topic is vast. Thus, the IAD Framework Overview emphasises only
those aspect of the framework that are salient to the study and, generally, reappear in *Research Design and Methodology* (p. 94).

The theoretical discussion most related to the formation of the Workshop in Political Theory and Policy Analysis (also known as the Bloomington School) and the IAD framework arguably begins with the 1961 American Political Science Review article, “The Organization of Government in Metropolitan Areas: A Theoretical Inquiry” (V. Ostrom, Tiebout, & Warren, 1961). The article introduces the view of government in metropolitan areas as polycentric political systems (or “multinucleated political system”). The general concept of *polycentric order* is a foundation stone of institutional analysis. Polycentric order, as opposed to gargantuan, suggests that overlapping jurisdictions might be more efficient and effective than a single power centre (McGinnis, 1999). While gargantuan may provide an optimal organisational structure for the delivery of large public services, such as policing, it might not (R. C. Wood, 1958). The question of the complexity and bureaucracy of gargantuan led to subsequent questions of inefficiency in the delivery of public services.

The first empirical studies of the Bloomington School to inquire into this question of efficiency in public service delivery were with the police. A major component of this formative research was the study of police service delivery and the interrelationship amongst different jurisdictions. The results of this work is contained in a book length treatment of the research (E. Ostrom, Parks, Whitaker, et al., 1978). From this policing work and other early research programs, the IAD framework was developed. The publication of the nascent model appeared in 1982 (Kiser & Ostrom, 1982). Subsequent Workshop research programs have focused on the management of common-pool resources such as water, fisheries, and forests from California to Nepal as well as the macro structure of constitutional order (McGinnis, 1999). Thus, the IAD framework has been under continuous use and development over the past forty years. The social-ecological systems (SES) framework, a derivative of the IAD framework, provides an augmented framework based, in part, on those results (Anderies, Janssen, & Ostrom, 2004).

From the mid 1980’s the Workshop and partners moved away from a focus on policing and metropolitan government. McGinnis (1999) explains the change in three ways. First, policy issues of police forces were very complex and difficult to explain,
particularly when attempting to describe research findings within the context of polycentric governance in metropolitan areas. Second, was that research results of the Workshop conflicted with the political climate of the times, such as where research supported, in some cases, the advantages of small organisations for public service deliver over gargantuan ones (E. Ostrom, Parks, & Whitaker, 1973). Third was that the two major players, Elinor and Vincent Ostrom, moved on to other research projects including the common pool resources work that has been a primary Workshop focus since its early years. However the Commons and constitutional governance interests of the major players should not be misconstrued as a lack of interest in the larger questions of institutional diversity. Elinor Ostrom makes clear that it is not the discipline that is the criterion for inquiry. It is the pursuit of understanding of whether there are an underlying set of universal building blocks that cut across disciplines, what those building blocks might be, and how they come to create institutions (E. Ostrom, 2005).

The recent article “Riding in the cars with boys: Elinor Ostrom’s adventures with the police” brings the topic of police full circle (Boettke et al., 2013). The article praises Ostrom’s legacy of on-the-ground research and also revisits the results of her and her research’s team’s early work on policing. This work challenged the popular belief that consolidation and centralization of services was the universally best way to provide public services through its study of police service delivery (E. Ostrom, Parks, & Whitaker, 1978; Parks, 1979, 1985). This work also raised issues such as the inadequacy of police internal records to provide data that can be easily analysed to understand police operations effectiveness, a contemporary policing problem articulated more expansively by Intelligence-Led Policing (E. Ostrom & Whitaker, 1973; J. Ratcliffe, 2011). This continues today as an unresolved issue with Federal Bureau Of Investigation’s (US) current crime index, the primary source of policing data in the US, as likewise unreliable and unable to provide data for the analysis of research questions about governmental responsiveness and citizen control (Boettke et al., 2013). One other legacy issues, and one which is relevant to this research, is the need for continued iterations of inquiry into the theoretical, then the practical, and back again.

“Understanding how individuals solve particular problems in field settings requires a strategy of moving back and forth from the world of theory to the world of action. Without theory, one can never understand the general underlying mechanisms that operate in many guises in different situations (E. Ostrom, 1990, pp. 45-46).
Thus, while the policing research was formative in the development of the IAD framework, policing has not been investigated using that framework. In a modest way, this research proposes to do just that and with a particular focus on collective action, collective choice, and problem solving.

E. IAD Framework Overview

![Diagram of the IAD framework]

**Figure 6. A Framework for Institutional Analysis (E. Ostrom, 2005, p. 15)**

The IAD framework (Figure 6) was developed, and continues to develop, as a tool to facilitate social science research. It is a multitier conceptual map. The framework provides a structure for investigating multilevel complex systems involving human interaction. It assists researchers to move beyond the simple, static cause-effect paradigm to one that is dynamic, multi-tiered, complex and more robust (E. Ostrom & Basurto, 2011). The purpose of this section is to provide a brief introduction to the IAD framework and identify the specific aspects of the framework that are relevant to this research project. More in depth overviews of the framework are available elsewhere (McGinnis, 2011a; E. Ostrom, 2005, 2010a, 2011). Table 2 presents the definitions of framework, theory, and model which comprise the ontological foundations and which should inherently drive the policy change process (Schlager, 1999).

The study of institutions is undertaken at three levels of specificity: frameworks, theories, and models. Frameworks provide the macro view for theoretical development and inquiry and also provide the metatheoretical language to aid that inquiry. Theoretical investigation enables the researcher to identify what part of the framework
is relevant to the question at hand. Theories make assumptions about those elements, how they work together, and what outcome might be predicted. Multiple theories are compatible with the IAD framework and include economic theory, game theory, and social choice theory to name a few (E. Ostrom, 2011). This thesis will specifically investigate a subset of social choice theory including rational choice, bounded rational choice, and behavioural rational choice, particularly the emerging general theory of human action (Poteete et al., 2010, pp. 220-227). Models are then used to make precise assumptions about a limited set of variables and to predict outcomes (E. Ostrom, 2005, 2011). A key component of the IAD framework is the action arena, and nested within it action situations.

Table 2. Ontological Foundations Reformatted from McGinnis (2011a, p. 170)

<table>
<thead>
<tr>
<th>ANALYTICAL TOOLS</th>
<th>DISTINCTIONS BETWEEN</th>
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<tbody>
<tr>
<td>Framework</td>
<td>Identifies, categorizes, and organizes those factors deemed most relevant to understanding some phenomenon</td>
</tr>
<tr>
<td>Theory</td>
<td>Posits general causal relationships among some subsets of these variables or categories of factors, designating some types of factors as especially important and others as less critical for explanatory purposes</td>
</tr>
<tr>
<td>Model</td>
<td>Specifies the specific functional relationships among particular variables or indicators that are hypothesized to operate in some well-defined set of conditions</td>
</tr>
</tbody>
</table>
1. **Action arena.**

![Diagram of Action Arena](image)

**Figure 7. The Focal Level of Analysis - an Action Arena (E. Ostrom, 2005, p. 13)**

Action arena (Figure 7) is the term used to describe where participants and an action situation “interact as they are affected by exogenous variables (at least at the time of the analysis at this level) and produce outcomes that in turn affect the participants and the action situations (E. Ostrom, 2005, p. 13). It differs from the action situation as shown in Figure 8. The factors that affect the action area are shown in Figure 6 and include: the attributes of the biophysical world that are acted upon in the arena, the structure of the community in which the action arena is placed, and the rules used by participants to order their relationships.

2. **Action situation.**

The action situation (Figure 8) refers to “the social space where participants with diverse preferences interact, exchange goods and services, solve problems, dominate one another, or fight (among the many things that individuals do in action arenas)” (E. Ostrom, 2005, p. 14). From the perspective of institutional analysis, the action situation provides a focal unit, providing a set of variables that allows for a structured description and analysis.

The structure of all these situations-and many more-can be described and analyzed by using a common set of variables. These are: (1) the set of participants, (2) the positions to be filled by participants, (3) the potential outcomes, (4) the set of allowable actions and the function that maps actions into realized outcomes, (5) the control that an individual has in regard to this function, (6) the information available to participants about actions and outcomes and their linkages, and (7) the costs and benefits—which serve as incentives and deterrents-assigned to actions and outcomes (E. Ostrom, 2005, p. 32)
Figure 8. The Internal Structure of an Action Situation (E. Ostrom, 2005, p. 33)

A more extensive discussion of each of these characteristics can be found in E. Ostrom (2005, Chapter 2) and (1983). Table 3 provides a synopsis of the more salient characteristics of each variable.

A final consideration in working with actions situations is the number of times a particular action situation will be repeated. This repetition is shown on Figure 6 (IAD framework) and Figure 8 (Action Arena) by the interactions as well as the evaluation of outcomes and the potential for looping back into the action arena. This capacity for feedback and learning adds a dimension to the IAD framework that has important theoretical implications. For example, one consideration is that actors are fallible and their actions may require multiple iterations to achieve an outcome acceptable to them.
However, this fallibility, iteration, and dynamism are not a consideration in classical choice theories.

**Table 3. Components of Action Situation Adapted from E. Ostrom (2005, Chapter 2)**

<table>
<thead>
<tr>
<th>COMMON VARIABLES OF ACTION SITUATION</th>
<th>DESCRIPTION</th>
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<tbody>
<tr>
<td>Participants</td>
<td>Participants are &quot;decision-making entities assigned to a position and capable of selecting actions from a set of alternatives made available at nodes in a decision process, (p. 38).&quot; Participants can be individuals, teams, or composite actors, e.g. a household, and attributes.</td>
</tr>
<tr>
<td>Positions</td>
<td>Positions describe the allowable actions of a participant and the authorised actions and limits on actions that the position holder can take. The capacity exists for &quot;anonymous slots&quot; (pp. 40,193)</td>
</tr>
<tr>
<td>Potential Outcomes</td>
<td>Outcomes are the consequence or result, including unintended outcomes and status quo outcomes (pp. 64-65).</td>
</tr>
<tr>
<td>Action-Outcome Linkages</td>
<td>&quot;An action can be thought of as a selection of a setting or a value on a control variable (e.g., a dial or switch) that a participant hopes will affect an outcome variable (p. 45). A setting on a control variable is considered 'linked' to a state variable when it is possible to use that setting to cause the state variable to (1) come into being, (2) to disappear, or (3) to change in degree, (p. 45).&quot; The action-outcome linkage includes considerations of certainty, risk, and uncertainly on the structural aspects of the action situation.</td>
</tr>
<tr>
<td>Control</td>
<td>Control in the action situation is concerned with the &quot;extent of control over the linkage of the action to outcomes (p. 49)&quot; and includes considerations of opportunity and power.</td>
</tr>
<tr>
<td>Information</td>
<td>Information refers to the information available to participants in the action situation (pp. 50-52).</td>
</tr>
</tbody>
</table>
### COMMON VARIABLES OF ACTION SITUATION

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participants</td>
<td>Participants are &quot;decision-making entities assigned to a position and capable of selecting actions from a set of alternatives made available at nodes in a decision process, (p. 38).&quot; Participants can be individuals, teams, or composite actors, e.g. a household, and attributes.</td>
</tr>
<tr>
<td>Cost and Benefits</td>
<td>Costs and benefits include &quot;rewards and/or sanctions that may be distributed to participants in positions dependent on the path taken to achieve a particular outcome (p. 52).&quot;</td>
</tr>
</tbody>
</table>

### 3. Linking action arenas.

While action arenas have been presented above as independent entities, in social reality they are rarely independent. Action arenas often operate as multiples and are linked sequentially, simultaneously, or potentially. These linkages, as well as the number of times that an action situation is repeated within that arena, begin to raise issues of reciprocity, reputation and trust. These elements of reciprocity, reputation, and trust are not inherent in the rational choice and bounded rational choice theories and begin to predict behaviours that are inconsistent with both theories (E. Ostrom, 2005). Thus, the linkages between action arenas need to be understood as part of the analysis.

Action situations may likewise be linked. They are linked organisationally, as in the operations of one department affecting another. They are also linked to “shifting levels of analysis from one situation to a deeper rule-changing situation (E. Ostrom, 2005, p. 56).” This analysis of linked action situations allows questions of how, in two linked situations, the rules of one situation may be changed by the other. To facilitate this inquiry, the IAD framework, therefore, offers different levels of analysis and outcomes.

### 4. Levels of analysis and outcomes.

As a multitier conceptual framework, the IAD framework provides for hierarchical linkages within institutions, defining different levels of situations. These levels of analysis are shown in Figure 9 and include: meta constitutional, constitutional,
collective choice, and operation situations. These are nominal levels with an infinite capacity to expand. However, for the purpose of this study these four levels of working concepts and terminology are sufficient. While action arenas may be nested at one level of analysis, they might also be nested across several levels of analysis.

**Figure 9. Levels of Analysis and Outcomes (E. Ostrom, 2005, p. 59)**

In this study, two action arenas are created: endogenous and exogenous. The endogenous action arena occurs within the police organisation. The exogenous action
arena occurs both internal and external to the police organisation. The action situations within each arena involve both constitutional and collective-choice levels of analysis and outcomes. While the study will focus primarily on the collective-choice situations, organisational implications at the operational and constitutional level are discussed in *Discussion and Conclusion* (p. 172).

5. **Exogenous variables: Rules.**

![Diagram](image)

Figure 10. Rules as Exogenous Variables Directly Affecting the Elements of an Action Situation (E. Ostrom, 2005, p. 189)

The three sets of exogenous variables for the IAD framework (Figure 6) are: biophysical/material conditions, attributes of community, and rules. In this study both the biophysical/material conditions and attributes of community were assumed to be fixed. The exogenous factor incorporated into the study is rules. In the context of the IAD framework, rules are defined to be shared understandings by participants about *enforced* prescriptions concerning what actions (or outcomes) are *required*, *prohibited*, or *permitted* (Commons, 2007; Ganz, 1971; V. Ostrom, 1980). All rules are the result of implicit or explicit efforts to achieve order and predictability among humans by creating classes of persons (positions) who are then required, permitted, or forbidden to take classes of actions in relation to required, permitted,
or forbidden outcomes or face the likelihood of being monitored and sanctioned in a predictable fashion (V. Ostrom, 1991) in (E. Ostrom, 2005, p. 18)

Figure 10 illustrates the action situation and indicates the name of the rule that affects each variable.

Rules need not be the result of law nor written down. For example, formal institutions are characterised by rules-in-form. Informal institutions are characterised by rules-in-use. The dominant rule is that which is the working rule, i.e. the set of rules to which participants would make reference if asked to explain and justify their actions to fellow participants (E. Ostrom, 2005, p. 19). It is therefore possible to have written rules, including a legally created one, but have the rules-in-use differ substantively. This includes rules-in-use being different from the rules-in-form of a formal institution. Rules-in-use will be the rule form used in this study.

Table 4. Rule Definitions Adapted from E. Ostrom (2005, Chapter 7)

<table>
<thead>
<tr>
<th>RULE</th>
<th>DEFINITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Position</td>
<td>&quot;the set of positions or anonymous slots that are filled by participants and to which specific action sets are assigned at junctures in the decision process&quot; (p. 193).</td>
</tr>
<tr>
<td>Boundary</td>
<td>Also called entry and exit rules &quot;define (1) who is eligible for a position, (2) the process that determines which eligible participants may enter (or must enter) positions, and (3) how an individual may leave (or must leave) a position&quot; (p. 194).</td>
</tr>
<tr>
<td>Choice</td>
<td>&quot;specify what a participant occupying a position must, must not, or may not do at a particular point in a decision process in light of conditions that have, or have not, been met at that point in the process&quot; (p. 200).</td>
</tr>
<tr>
<td>Aggregation</td>
<td>&quot;determine whether a decision of a single participant or of multiple participants is needed prior to an action at a node in a decision process&quot; (p. 202).</td>
</tr>
<tr>
<td>Information</td>
<td>&quot;information available to participants about the overall structure of the situation, the current state of individual state variables, the previous and current moves of other participants in positions, and their own past moves&quot; (p. 206).</td>
</tr>
<tr>
<td>RULE</td>
<td>DEFINITION</td>
</tr>
<tr>
<td>------</td>
<td>-------------</td>
</tr>
<tr>
<td>Payoff</td>
<td>&quot;assign external rewards or sanctions to particular actions that have been taken or to particular readings on outcome state variables&quot; (p. 207).</td>
</tr>
<tr>
<td>Scope</td>
<td>&quot;affect a known outcome variable that must, must not, or may be affected as a result of actions taken within the situation&quot; (p. 208).</td>
</tr>
</tbody>
</table>

In addition to being defined, as in Table 4, rules can also be classified. Two classification approaches are: horizontal and vertical. The horizontal approach uses the acronym AIM(sic) and is concerned with the level of action. The horizontal approach classifies a rule by that part of the action situation that is most directly affected.

The vertical approach classifies rules by operational, collective-choice and constitutional-choice levels of analysis. These rules are nested within these hierarchical levels. For example, operational rules are crafted in a collective-choice situation that was, in itself, structured by collective-choice rules that were crafted in constitutional situations (E. Ostrom, 2005, pp. 214-215). The relevance of these hierarchical rule sets is important in discussing sustainability.

**Table 5. The AIM (sic) Component of Each Type of Rule (E. Ostrom, 2005, Table 7.1, p. 191)**

<table>
<thead>
<tr>
<th>Type of rule</th>
<th>Basic AIM verb</th>
<th>Regulated component of the action situation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Position</td>
<td>Be</td>
<td>Positions</td>
</tr>
<tr>
<td>Boundary</td>
<td>Enter or leave</td>
<td>Participants</td>
</tr>
<tr>
<td>Choice</td>
<td>Do</td>
<td>Actions</td>
</tr>
<tr>
<td>Aggregation</td>
<td>Jointly affect</td>
<td>Control</td>
</tr>
<tr>
<td>Information</td>
<td>Send or receive</td>
<td>Information</td>
</tr>
<tr>
<td>Payoff</td>
<td>Pay or receive</td>
<td>Costs/Benefits</td>
</tr>
<tr>
<td>Scope</td>
<td>Occur</td>
<td>Outcomes</td>
</tr>
</tbody>
</table>
Language, as used practically, helps one to understand the type of rule. There is also an association between the components of the action situation and the type of rule. Table 5 provides the language associated with each rule as well as its associated action situation component. This study will focus primarily on choice rules.

6. **Outcomes and evaluative criteria.**

Outcomes may result not only from the action situation but also from exogenous influences. Thus, the action situation is said to have potential outcomes which are subjected to evaluative criteria that assesses the true outcome. Evaluation can occur at any stage and allows for continued feedback and sequential iterations of the action situation if needed, as will be the case in this study. These evaluative criteria are shown in Table 6.

**Table 6. Evaluative Criteria Reformatted from McGinnis (2011a, p. 176)**

<table>
<thead>
<tr>
<th>CRITERION</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Efficiency</td>
<td>in use of resources, especially capture of economies of scale</td>
</tr>
<tr>
<td>Equity</td>
<td>in distributional outcomes and processes</td>
</tr>
<tr>
<td>Legitimacy</td>
<td>as seen by participants in decision processes</td>
</tr>
<tr>
<td>Participation</td>
<td>tends to increase legitimacy; co-production can be an especially effective form of participation</td>
</tr>
<tr>
<td>Accountability</td>
<td>especially to direct users of resource</td>
</tr>
<tr>
<td>Fiscal Equivalence</td>
<td>the extent to which the beneficiaries of a public good or service are expected to contribute toward its production</td>
</tr>
<tr>
<td>Moral Values</td>
<td>consistency with moral values prevalent in that community</td>
</tr>
<tr>
<td>Adaptability, Resilience, Robustness, or Sustainability</td>
<td>loosely speaking, a system's capacity to suffer a disturbance and yet still continue to function, without losing its basic structural or functional integrity. Of these terms, robustness is the term most appropriate for use as a performance criterion for human-designed systems</td>
</tr>
</tbody>
</table>
7. **Collective action and collective choice.**

Collective action and collective choice are different. Where collective action refers to the phenomenon that occurs when a group of individuals with similar interests work together towards a common goal (Olson, 1965), collective choice refers to the process of the collective work and the outcomes, i.e. choices (E. Ostrom, 2005). The collective aspect refers to the macro level rules and regulations that play a role in a group’s decision making.

Collective action refers to how, when a group shares a set of interests and goals, they work together to attempt to reach this potential (Olson, 1965). Olson argued that when collective action occurs, it is unlikely that the group will reach their goal. His reasoning was that, in a large group, there is little individual motivation to contribute and, therefore, a member will wait for the rest of the group to take action. He also argued that working in a small group will lessen this problem (Massey, 1994, pp. 421-422) but not eliminate it. Olson’s findings have been elaborated on by theorists from different disciplines, most often to use collective action as a reasoning for social and economic phenomena, but at times simply to elaborate on collective action itself.

The IAD framework utilises the concept of collective action but not collective action theory since the research results do not support it. For example, the notion that larger groups being less effective than small face-to-face groups does not stand up to the research (E. Ostrom & Ostrom, 2014, p. 84). In part, the observed results can be attributable to trust (Arrow, 1974 in E. Ostrom, 2009; Rothstein, 2005) while collective action theory focuses more on payoffs of transactions (E. Ostrom, 2009, pp. 431 - 432). Trust then leads to the notion of reciprocity in collective action and, eventually, of reputation (E. Ostrom, 2005, Chapter 4). All of which then leads to the heuristics used by individuals to make collective choices in social dilemmas. The IAD framework incorporates collective action intrinsically through its action situations (E. Ostrom, 2005, Chapters 2 and 3).

Collective choice is a crucial aspect of the IAD framework and is presented through different levels of analysis which translate to choice decisions. The major levels identified by E. Ostrom (2005, pp. 58 - 64) and presented in Figure 9 are:
• the operational level (e.g. everyday life of individuals, working level of organizations),

• the collective choice level, which includes more formal settings (such as legislatures, regulatory agencies, and courts) as well as informal arenas (e.g. gatherings, appropriation teams, and private associations, and

• the constitutional level (with the potential addition of an even more basic metaconstitutional level).

Rules are an inherent component of this analysis and have been described in *Exogenous variables: Rules* (p. 61).

**8. Face to face communications.**

Mehrabian and Ferris (1967) state that the meaning derived from communication is 7% verbal, 38% vocal, and 55% facial expression and body language. Brosig, Weimann, and Ockenfels (2003) argue that these three components are the key to why face to face communication is the optimal means of communication, as opposed to phone or email communication, as neither of the latter options provide all three components at the same time. Research seems to confirm these findings, as there are “fifty years of studies showing significantly more effective cooperation in conflict resolutions using face-to-face rather than written communications” (Helliwell & Huang, 2013, p. 2).

Current studies focus on the increase in electronic communication and social media and its effect on human affect due to the lack of face to face communication. Overall, these studies argue that: people are less satisfied with relationships formed from electronic communication as opposed to face to face communication (Helliwell & Huang, 2013), cooperation is increased when in the presence of others (Ramsuben, 2014), and that when people communicate in person they tend to be more honest and more moral (Van Zant & Kray, 2014).

E. Ostrom (2005, Chapter 3) discusses the experimental and field findings in support of face-to-face communication. For example, enforced external rules may achieve less than face-to-face communication.
Subjects, who were simply allowed to communicate with one another on a face-to-face basis, were able to achieve a higher joint return than the subjects who had an optimal but imperfectly enforced external rule imposed on them. These experiments provide further support for Bruno Frey’s (1997a, 1997b) hypothesis that external rules imposed on citizens can crowd out intrinsic motivation and lead to worse outcomes than reached through voluntary agreements (E. Ostrom, 2005, p. 95).

(E. Ostrom, 2005, p. 254) observes that in the field, this face-to-face aspect of collective action is important. When individuals have the autonomy to change rules, face-to-face communication may be the gating factor as to whether they organise themselves. The operative factors appear to be: “exchanging mutual commitment, increasing trust, creating and reinforcing norms, and developing a group identity” (E. Ostrom, 1998, p. 7).

9. Key IAD framework components and summary.

To recapitulate the main components of the IAD framework (Figure 3) there are: inputs, the action situation, outcomes, evaluation, as well as feedback and adaptive learning (McGinnis, 2011a). Inputs include the contextual factors (exogenous variables) that “encompass all aspects of the social, cultural, institutional, and physical environment that set the context within which an action situation is situated” (McGinnis, 2011a, p. 172). The action situation is the “black box” (McGinnis, 2011a, p. 172; McGovern & Yacobucci, 2008). Outcomes are the result of the exogenous variables and action situation. Participants then evaluate. Feedback and adaptive learning may also occur and modify the process at any stage (McGinnis, 2011a). Thus with evaluation, feedback, and learning, the framework becomes less of one where participants have perfect knowledge but, rather, are fallible and have imperfect knowledge. The situations analysed are also nonmarket versus market. Face to face communication is an important consideration in collective choice.

These conditions do not align with the assumptions of rational choice theory (E. Ostrom, 1991). Thus, results obtained have often not supported rational choice and bounded rational choice theory. The emerging theory of behavioural action choice recognises fallibility as well as trust, reciprocity, and reputation. A more extensive
review of these theoretical considerations is contained in *Theoretical Perspective*, (p. 71).


The *IAD Framework Overview* is admittedly a very sparse representation of 40+ years of work by the Bloomington School and its participants. The review has focused on broad elements of the IAD framework and those that are specifically relevant to this study. Even in this sparse state, the IAD framework would appear to be complex and difficult to use. Ostrom addresses this problem:

The challenge of institutional theorists...is to know enough about the structure of a situation to select the appropriate assumptions about human behaviour that fit the type of situation under analysis....As a scholar committed to understanding underlying components of all social systems, I do not introduce complexity lightly. I view scientific explanation as requiring just enough variables to enable one to explain, understand, and predict outcomes in relevant settings. Thus, for many questions of interests to social scientists, one does not need to dig down through nested layers of rules....One can develop a good analysis of the situation..., decide what assumptions to make about participants... and predict outcomes. If predictions are supported empirically, that may be all that is needed (E. Ostrom, 2005, pp. 7-8).

One example of the above is the practical notion of the action situation as a “black box” (McGinnis, 2011a; McGovern & Yacobucci, 2008) where a small number of variables are used. This recognises that there is complexity but encourages a focused, minimalist, approach to analysis, the purpose of which is to understand behaviours and test theory. This study uses that approach.

11. Recent developments in the IAD framework.

Ostrom’s focus of inquiry and that of the Bloomington School Workshop moved early on from questions about policing to those of common pool resources (McGinnis, 1999). However, Elinor Ostrom reconfirms that the Workshop’s intent is continued broad inquiry into “empirically supported theory of self-organizing and self-government forms of collective action” the nature of which demands an interdisciplinary approach
The Workshop also places a “special emphasis on the concept of ‘public entrepreneurship.’” (E. Ostrom in Aligica & Boettke, 2009, p. 155). This breadth of scope and entrepreneurial emphasis have led to evolutions ranging from new methodological and analytical approaches to changes in the IAD framework itself.

Particularities about inquiry into resource governance have subsequently led to the development of the Social-Ecological Systems (SES) framework (E. Ostrom & Cox, 2010). The SES responds to difficulties many ecologists were finding in the IAD framework with regards to the exogenous variable “biophysical world” being too constrained (E. Ostrom, 2011). In addition, the concept of “action arena” appeared to be confusing with the suggestion made that “action situation” be used to encompass the characteristics of both (McGinnis, 2011b; E. Ostrom, 2011). These framework changes retain the integrity of the IAD framework but for resource governance inquiry, in particular, allow for more investigation into more complex ecological settings (E. Ostrom, 2011).

This study uses the IAD framework because the questions being asked are about public goods and services governance as opposed to resource governance. This study also retains the “action arena” because it has value in describing the procedural approach to the fieldwork, as described more full in Research Design & Methodology (p. 94).

12. Methodological implications for this study.

The challenge for institutional analysts are threefold. First is that the language within and between disciplines is inconsistent. The term “neighbourhood” may have a different definition for different researchers as well as for different geophysical locations, e.g. urban versus rural. A second challenge is determining what the appropriate level of analysis is for a given question (E. Ostrom, 2005).

Ostrom encourages investigation into small elements of institutional analysis to ensure that the diverse elements of a problem are understood: “Thus, it is important to learn about relatively simple situations that have been successfully analysed and shown to have empirical support before venturing off into the interesting but difficult work of understanding and explaining behaviour in more complex settings” (E. Ostrom, 2005, p. 94).
The action arena provides that small element. It is of particular interests to the work of institutional analysis because the action arena is dynamic. It is the place where diverse types of situations, including social dilemmas, are animated.

The third challenge is to ensure that the analysis of institutions encompasses broad nonmarket situations (E. Ostrom, 2005). A particular impetus for this nonmarket approach is the application of rational choice theory and bounded rational choice theory. Both theories developed to explain behaviour in the marketplace. One major issue is the theoretical assumption that it is possible to have complete knowledge in the marketplace. It is also unlikely for participants to have complete knowledge in nonmarket situations. As a result, the outcomes predicted by rational choice theories are not supported in many social dilemmas.

We are likely to make more progress if we do not try to develop a single model of human behaviour that can be used to predict behaviour in all market and nonmarket action situations. A more focused effort to explain collective action in overcoming social dilemmas appears to have a higher probability of success in the near future (E. Ostrom, 2005, p. 120).

The methodology of this study will involve action situations with social dilemmas that explore all three choice theories.

Social dilemmas are also situations where each member of the group has a clear incentive to make a choice that results in a poorer outcome for all groups members had that choice not been made.

Social dilemmas are defined by two simple properties: (a) each individual receives a higher payoff for a socially defecting choice (e.g. having additional children, using all the energy available, polluting his or her neighbours) than for a socially cooperative choice, no matter what the other individuals in society do, but (b) all individuals are better off if all cooperate than if all defect (Dawes, 1980, p. 169).

This paradox has been observed in almost all social sciences (Dawes & Messick, 2000). The term “collective action problem” is sometimes represented as a synonym for “social
The concept of a “collective action problem” begins to consider the notions of reciprocity, trust, and reputation that extend the theoretical considerations beyond purely rational choice.

Also advocated by institutional analysts is a broader, more encompassing research approach. Because of the challenges of inquiry, no single method overcomes all the challenges and “methodological pluralism” is advocated. A strong emphasis on mixed methods has resulted (Poteete et al., 2010). The objective is to capture the richness of the situation. While some of that richness can be obtained from a, for example, small-N experiment, the subtleties of the participant interactions and the “cheap talk” will not. The preference is to use two or more methods at each stage of research.

That being said, Ostrom advocates a conservative approach to inquiry,

Once one decides to explore alternative assumptions about human behaviour, the number of choices that the researcher has to make are substantial. Alternative assumptions are not likely to be as clean and elegantly simple as those of rational choice models. Frohlich and Oppenheimer (2001, p. 22) reflect that the “standard rational choice model, simple, elegant and decisive, is not liable to be replaced with as simple and manipulable a model. The anomalies which have been identified are broad and diffuse and they are likely to require more theoretical superstructure for their explanation”....The grave hesitation of some theorists to adopt “more realistic” assumptions stems, to a large extent, from the messiness of the alternative superstructures (E. Ostrom, 2005, p. 103)

Thus, Ostrom and others have adopted a conservative strategy of not changing all assumptions at the same time when trying to model a particular situation, an approach that this study also adopts.

F. Theoretical Perspective

Table 1 provides information on the stated theoretical basis of each of the contemporary police approaches as identified in the literature. There are many blanks. Several, like third party policing, have a strongly inferred deterrence theory basis. However, the link
is not clearly articulated in the third party policing literature and has, as a result, been
left unstated. What remains are a number of theoretical foundations that are either (a)
specifically rational choice or bounded rational choice based or are, (b) derivatives of
rational choice such as rational choice perspective, routine activities theory and
deterrence theory.

This section will first introduce rational choice and bounded rational choice theory since
they are foundation theories for police research as well as providing one aspect of the
theoretical inquiry of this study. Next, the theories of the contemporary police
approaches as described in Table 1. Following this is a more multidisciplinary
discussion about the current state of rational choice and bounded rational choice theory.
Finally the emerging behavioural theory of human action is introduced.

1. **Rational choice and bounded rational choice theory.**

Martinelli (2010) provides a basic outline of rational choice theory as adapted from
Becker (1991) and as offered from a sociological as opposed to economic perspective.
This choice of orientations for the Literature Review was made to lessen the harsher
contrasts that can result from the use of economic terminology. Three formulations of
the theory exist:

1. The classical maximization approach assuming utility and profit optimization
   (with transitivity, independence and completeness), perfect competition and
   information, accurate calculation, and the like.

2. The theory of bounded rationality that rejects the premise of optimization in
terms of ‘satisficing’, but retains utility and profits as objective functions and
   ends.

3. The stochastic, game theory model, where rationality is strategic rather than
   parametric and information and transaction costs play a key role (Martinelli,
   2010, 250).

The contemporary police approach research relies on the classical maximization and
bounded rationality formulations. The development of the IAD framework has involved
research into all three formulations. The collective theory has a number of key concepts
which are abbreviated here:
1. The teleological principal of individual purposive action as methodological precondition....

2. The concept of methodological individualism...according to which societal-level phenomena can only be adequately explained in terms of actions of individuals....

3. The concept of (utilitarian-economic) rationality as optimization of the means-ends relation through consistent cost-benefits calculations....

4. The concept of stable preferences....

5. The concept of market equilibrium, according to which the market as the most efficient mechanism for exchange and resource allocation in conditions of scarcity (Martinelli, 2010, pp. 251-253).

Because of objections to the assumptions, including portraying individuals as rational egoists, those situations where individuals do not act rationally, and other issues, sociological proponents of rational choice have tended towards a “loose version” of the theory (Martinelli, 2010, p. 253), not unlike the modifications observed below in criminology.

2. Theoretical foundations of contemporary police approaches.

While the argument can be made that the theoretical attributions in Table 1 might be expanded, it is correct to say that most contemporary policing approaches have a stated or inferred rational choice precedent. These precedents have been developed in different ways. Clarke (2014, p. ix) reviews the 1986 edition of The Reasoning Criminal: Rational Choice Perspectives on Offending where rational choice perspective (RCP) was introduced and then discusses criticisms of it since that introduction. RCP contains six core concepts and four decision making models, of which the concepts are:

- Criminal behavior is purposive
- Criminal behavior is rational
- Criminal decision-making is crime specific
- Criminal choices fall into two broad groups: ‘involvement’ and ‘event’ decisions
• There are separate stages of involvement

• Criminal events unfold in a sequence of stages and decisions (Cornish & Clarke, 2011, p. 24)

Introduced as a theory of crime, as opposed to criminality or delinquency, Clarke (2014, p. xii) states that RCP was not intended as a “full-fledged theory, but only to be ‘good enough’ to guide policy thinking.” It can more accurately be described as a heuristic device or conceptual tool (Cornish & Clarke, 2011, p. 24). One of its main objectives is “to provide a more secure theoretical underpinning for situational crime prevention (Clarke, 2014, p. ix) and, as such, it takes the bounded rational choice model of decision making (Simon, 1978).

The criticism of RCP from within the criminological community is in one degree a criticism of how the theory has been used, as opposed to a criticism of the theory of bounded rationality itself. Researchers have tended to focus on the “rationality” part of the model while forgetting the “bounded” part. Thus, since its introduction in 1986, little theoretical development of RCP has taken place (Wortley, 2013, p. 239). Wortley points out, as do others, the explosion of major advances in other fields, such as neuroscience and behavioural economics, little of which is evident in models of criminal decision making (Van Gelder, Elffers, Reynald, & Nagin, 2013, p. 13 in Cornish & Clarke, 2014). Thus, some of the limitations of the foundation choice theories are evident in the derivative criminology theories as well.

Deterrence theory is one example. “Deterrence theory posits that crime can be prevented when the costs of committing the crime are perceived by the offender to outweigh the benefits (Gibbs, 1975; F. Zimring & Hawkins, 1973)” (Braga & Weisburd, 2012b, p. 324). Classical deterrence is a form of rational choice theory, and Kennedy (2009) provides a review of some of the problems with its rational choice foundations. First, is that the structured thinking of rational choice, and the continuous assessment of profit maximization, is not how people think. For example, an armed robber is “is unlikely to make, on the brink of each crime, the fine-grained calculations about the expected value of the robbery or the likelihood of apprehension and punishment, still less about the long-term consequences of an arrest or a prison record” (Kennedy, 2009, p.16). And if offenders are not rational, he asks, where does this leave
deterrence theory? He then introduces the idea of “radical subjectivity” (Kennedy, 2009, p. 23). In this approach, Kennedy redefines the benefits and costs of deterrence as those as understood by offenders and potential offenders, extending the concept of rationality to the subjective. Most important, he introduces a simple point:

Collectivities, not individuals, and processes involving collectivities are at the center of some of the most powerful ways we have to understand and address crime. Crimes, viewed as events, frequently involve groups of some sort.... Such collectivities matter a great deal. Nearly as important, and secondary perhaps only as a matter of logical and causal precedence, are dynamics within and between such collectivities (Kennedy, 2009, p. 75).

Piquero, Paternoster, Pogarsky, and Loughran (2011) observe that the empirical research on deterrence theory is mixed and echo Kennedy in offering that social bonding, morality, and social network position might be of importance.

Routine activities was introduced as an approach for analysing crime rate trends and cycles (L. E. Cohen & Felson, 1979). The authors’ use of the term “approach” and “analysis” metamorphosed to the term “theory” in the police research community at some later point in time and in a way that is unclear. The parameters of the approach include a likely offender, a suitable target, and the absence of a capable guardian all converging in time and space. The approach has provided the transition from a focus on criminals to a focus on place and is often twinned with rational choice to explain criminal behaviour (Braga & Weisburd, 2010, p. 72). It is largely a specific variation of bounded rational choice in that it involves an actor in a choice situation. Nonetheless, the transition to place is important. Routine activities theory provides the foundation of environmental criminology, also known as crime pattern theory, which combines rational choice and routine activity (Braga & Weisburd, 2010; Brantingham & Brantingham, 1991, p. 75).

The reader will have observed that to this point, research on the contemporary police approaches and its theoretical discussion deals with (a) places and (b) people. However, the “people” discussed are almost universally “criminals” or “offenders.” Kennedy’s quote above is particular relevant in this regard (Kennedy, 2009, p. 75). Thus, the discipline finds itself with a limited theoretical basis; that which it has is often stale;
and, generally, that theory is applied primarily to one agent of many. The policing literature is virtually silent on the theories as applied to other participants, including the non-offending public and the police themselves, as well as dynamics amongst them. It is this collective dynamism that this study will explore through Research Statements three and four.

3. **Current observations about rational choice theories.**

The title of a recent article encapsulates the current state of rational choice theories in the social sciences: *Rational choice requiem: The decline of an economic paradigm and its implications for sociology* (Zafirovski, 2014). Zafirovski introduces the death of *homo economicus* and reviews the breakdown of:

- The assumption of exclusive economic motivation and universal egoism
- The assumption of fixed tastes and preferences
- The conception of perfect rationality

He is not alone in his observations. Martinelli argues that:

> The dilemma of rational choice applications outside economics is that, wherever the assumptions of rational choice are accepted in their strong version, the theory is logically more consistent, but inadequate to interpret and explain social relations which are much more complex than economic life, whereas wherever a weak version is adopted, assumptions become more reasonable but the rational choice perspective tends to lose its specific character. Many recent versions of rational choice incorporate notions of unstable preferences, risk and uncertainty situations, incomplete information, power differentials among actors, satisficing rather than maximizing 'bounded rationality' models. But in so doing they stretch the idea of the rational to the point of theoretical degeneration. As Smelser points out, "everything becomes rational if you push hard enough, and 'rational' becomes more or less synonymous with 'adaptive' “ (Martinelli, 2010, p. 254).

Hodgeson approaches the same observation from a different angle. “Q: Why did the chicken cross the road? A: To maximize its utility. Some economists may be satisfied with this answer. But it tells us nothing about chickens, roads, specific motives,
developmental histories, or detailed causal mechanisms” (Hodgson, 2012, p. 101). And as economists are questioning and deconstructing rational economic man and rational choice, sociologists (and criminologists) appear to have become enamoured (Hodgson, 2012; Kontopoulos, 1993).

Various observations have contributed to the requiem. Game theory has played an important part in identifying the limitations of rational choice theory. Experimental research has shown that “behavior in many forms of social dilemmas and other games is not consistent with what would be predicted if all individuals behaved in a manner consistent with the rational egoist model” (E. Ostrom, 2005, p. 102). Zafirovski (2014, p. 214) points to a number of leading scholars including Nobel-Prize winning economists, sociologist, and theorists who in their writings have diagnosed or anticipated the breakdown. This breakdown raises a dilemma.

how scientifically rational or theoretically reasonable and explanatory is it to continue generalizing to and praising as a sort of scientific panacea for sociology and all social science a theoretical paradigm and approach that shows accelerating, even alarming, multiple, and seemingly irremediable syndromes of breakdown, failure, crisis, or inadequacy even at its original home and natural habitat, economics (Zafirovski, 2014, p. 446).

To paraphrase Kennedy (2009, p. 17), if rational choice theory does not explain the behaviours of offenders (or anyone else), criminology and police research are in big trouble.

Many of the aforementioned leading scholars who have anticipated the demise of rational choice have also been working on frameworks and theories that do not rely on rational choice. One compensatory approach is to recognise that rational choice theory has a place, but a place that is decidedly limited and involving qualitatively different questions than those which involve an institutional context (Martinelli, 2010; Mouzelis, 2010; E. Ostrom, 1998). That is, rational choice theory becomes but one tool in a larger toolkit. Other tools are those frameworks and theories that are more appropriate to the complex questions and developed by scholars for whom rational choice has been inadequate. Two of these scholars are Elinor and Vincent Ostrom, whose body of work has been instrumental in creating the Institutional and Development framework.
Investigations using the IAD framework have consequently led to the emerging general behavioural theory of human action.


Over twenty years ago E. Ostrom (1991, p. 238) observed the limitations of rational choice theories, in particular as tools for normative analysis and empirical explanation. In 1998, she reviewed these limitations and offered an “initial theoretical scenario” that incorporates reciprocity, reputation, and trust (E. Ostrom, 1998, p. 1). She argued the need for a grounded theory of collective action since this describes a multitude of human endeavours as well as provides the core justification for the state. In addition, the behavioural aspect of this theory is essential to understanding “why face to face communication so consistently enhances cooperation in social dilemmas or how structural variables facilitate or impeded effective collective action” (E. Ostrom, 1998, p. 1). Her review of the limitations of first-generation rational choice concludes acknowledging that complete rationality models have their place but that a second generation model is needed that “views all humans as complex, fallible learners who seek to do as well as they can given the constraints that they face and who are able to learn heuristics, norms, rules, and how to craft rules to improve achieved outcomes” (E. Ostrom, 1998, p. 9).

At this time, Ostrom does not offer a new formal model but identifies the attributes of a second-generation model of rationality.

The individual attributes that are particularly important in explaining behavior in social dilemmas include the expectations individuals have about others’ behavior (trust), the norms individuals learn from socialization and life’s experience (reciprocity), and the identities individuals create that project their intentions and norms (reputation) (E. Ostrom, 1998, p. 14).

However she does provide some illustrative examples and research questions, one of which relates to how institutions, such as policing in this study’s case, enhances or restricts the building of mutual trust, reciprocity and reputations (E. Ostrom, 1998, p. 17).
From this point forward the development of this theory appears in a number of contexts and by a number of names: “a more general behavioral theory of human action” (Poteete et al., 2010, p. 220), “a more general theory of the individual” (E. Ostrom, 2009, p. 429), and “behavioral rational choice” (McGinnis, 2011a, p. 170). The former term, while somewhat unwieldy, is used in this study since it concretely ties to explicative literature. We discover that scholars are still in the frontier of this second-generation work. The aspects of trust, reciprocity, and reputation have not changed from Ostrom’s perspective. However, what is now being proposed is a family of models, of which rational choice is redefined as but one model, with these models being useful for analysing human decision in experimental settings (Poteete et al., 2010, p. 211). This approach is consistent with the IAD framework in terms of models being used to explore theoretical questions, and it is also consistent with Ostrom’s historical advocacy of experimental research, where variables can be more rigorously controlled providing the foundation for theory, than field work, where control of variables is difficult.

Some observations that are particularly interesting as this second generation theory develops is the more direct influence of microsituational variables, as compared with broader contextual variables, as well as the centrality of trust (Poteete et al., 2010). Thus context becomes important. Put succinctly, the “core problem that needs to be solved in order to increase cooperation is creating trust among participants that others are reciprocators, and that cooperating will not make an individual a sucker” (Poteete et al., 2010, p. 229). Poteete et al. (2010, pp. 229-231) go on to describe microsituational variables known to increase trust and positive outcomes, at least in experimental social dilemmas and in some field settings. However, the conclusion is that the complexity and multiple levels of analysis of such inquiries require a number of diagnostic theories to illuminate causal processes. The IAD framework is the ontological framework that supports the development of those diagnostics theories (Poteete et al., 2010, pp. 232-233). But the methodology used is just as important to ensure that the framework is used optimally.
G. Best Practices in Research Methodology

This section is introduced to explore the methodological issues from two perspectives: social science generally and police research in particular. Methodology is a very contemporary and hot debated topic in policing. This study’s design and methodological decisions are framed to respond to the best practices in social research methods (SRM).

1. Social science best practices and social research methods (SRM).

In their historical review of social research methods, Crothers and Platt (2010) discuss the best practices of the contemporary era. SRM has developed along several tracks including the meta-theoretical as well as the “formalisation of methodology and detailed empirical investigations into how methods work and can be improved” (Crothers & Platt, 2010, p. 44). From a historical perspective, the authors identify the 1930s-1980s as having an emphasis on a broadly positivist approach augmented by specialist methods that were exploratory or qualitative. The 1970s to present have resulted in an evolution to a “more balanced framework of ‘mixed methods’ ” with the different levels of emphasis on this approach depending on the discipline (Crothers & Platt, 2010, p. 45). Another evolution has been that with SRM becoming more inter-disciplinary, that particular disciplines can no longer lay claim to specific methods as being their sole methodological approach.

Poteete et al. (2010) provide a book length treatment of this topic and strongly emphasise the need for mixed methods to capture the robustness, depth, and complexity of the human experience. Thematically they discuss the debate of the superiority of particular methods and the promise of multiple methods. Simply put, “no single method overcomes all challenges” (Poteete et al., 2010, p. 11). Using collective and the Commons as examples, the authors explore various methodologies and how methodological pluralism can be particularly effective. They also discuss the development of methodological approaches that are unique to the questions and conditions of inquiry, particularly in their discussion of agent-based models. Of particular interest is interconnecting theoretical inquiry with methodology (Poteete et al., 2010) and the recognition “that research in the social sciences requires both methods and theory” (Manicas, 2010, p. 126).
Manicas (2010) provides a broad survey of methodologies. He also differentiates between physical sciences and social sciences. While he agrees with Poteete that all methods have a role, he also states:

This means also that we must be clear about our goals and recognise that while the physical sciences provide useful lessons for inquiry in the social sciences, this demands that we have a sound conception of inquiry in the physical sciences. The idea of explanation and causality are critical here. But we need also to recognise that huge differences in subject-matters of the human and physical sciences make for differences in theory and methods, if not in goals (Manicas, 2010, p. 148).

Sabetti and Aligica (2014, p. 17) bring us back to “the notion that clarifying the methodological problem requires clarifying an epistemological problem and that, in turn, requires clarifying an ontological problem.” They also point out that when a methodological doctrine grows independent of these epistemological and ontological connections, that its analytical and empirical relevance becomes less and less (Sabetti & Aligica, 2014, p. 17).

Thus, SRM would guide the methodology from an antecedent theoretical question, from an ontology, and from an epistemology, with the understanding that the methodology was a fourth level consideration and one driven by the antecedent questions.

2. **Contemporary best practices in policing research methods.**

In direct contradiction of Manicas’ (2010) differentiation between the physical and human sciences and the relevant research methodologies involved, policing has most recently trended toward a positivist approach and experimentalism as the “gold standard” in criminology research (Braga, Welsh, et al., 2014; Laycock, 2012; Sherman, 1998). The Campbell Collaboration’s Crime and Justice Group, Academy of Experimental Criminology, and leading experimental criminologists are strong supporters of the use of randomized experiments (Braga, Welsh, et al., 2014). “The randomized experiment is generally considered the strongest research design available to evaluate programs and test theories due to its strong internal validity (Berk, 2005; Shadish & Cook, 2002)” (Braga, Welsh, et al., 2014, p. 2).
There are also critics of this approach and a contemporary debate about the topic. (Berk, 2005), a qualified proponent, also offers that randomized experiments should not be the automatic choice in part because they are difficult to do correctly and in part because they may not be appropriate to the question at hand. Another position is that a significant difference exists between experimental criminologists and crime scientists (Laycock, 2005) and their research methods reflect this difference.

experimental criminologists are firmly committee to randomized controlled trials as their preferred methodology; these are seen as the gold standard in experimental design (Sherman et al., 1998). Crime scientists, while applauding experimentation in crime control, take the view that the appropriate methodology is determined by the hypothesis under investigation. There is no a priori reason why this should be a randomized control trial. Indeed there are sometimes very good theoretical or ethical reasons why it cannot be such (Laycock, 2012, p. 104).

Thus, the debate is not only about methodology but about disciplinary fragmentation as well. Lacock discusses two examples using two Campbell Collaboration systematic reviews: (Lum, Kennedy, & Sherley, 2006) and (Weisburd et al., 2010). Lum and Kennedy offer a spirited response to criticisms of their approach while, at the same time, acknowledging that there does appear to be rising, albeit small, objections to the evidence-based approach and pure experimental method (Lum, 2011). Braga and Weisburd (2012b) in another Campbell Collaboration systematic review on focused deterrence express their concern about the lack of randomised control trial studies in the pool of literature. Others have pointed out that a random control trial methodology is impractical in some cases, e.g. the random assignment of cities at the national level, and does not recognise the complexity and interdependencies within policing (Kennedy, 2006, 2009; Moore, 2006).

Welsh, Braga and Bruinsma (2013) acknowledge the prior discussions and then offer a conclusion that well summarises the current methodological debate in police research:

It seems plausible that the advancement of experimental criminology within the broader criminology discipline has been hindered by a rather unproductive ideological academic fight over the value of different methodologies in establishing causation. To move forward, experimental criminologists should
explicitly adopt a more pluralistic view on what constitutes good social science research. It is worth reiterating that it should be the research questions that ultimately shape the selection of research methods and analytic models. Moreover, this in no way detracts from the need for high-quality experimental and quasi-experimental research (Welsh, Braga, & Bruinsma, 2013, pp. 416-417).

The problem with a discussion that focuses on methodologies is that it ignores the basic research tenet that focus should be on theory. The theoretical question being asked and the model designed to test that question should drive the methodological choice (Poteete et al., 2010). While more recent work indicates a broadening of the methodological debate in police research (Saunders, Lundberg, Braga, Ridgeway, & Miles, 2014), this methodological broadening does not eliminate the issues with theoretical connectivity in the research.

H. Considerations for Applied Policing Research

The police practitioner receptivity to the contemporary police approaches, in general, and to research, in particular, can best be categorised as tepid. In part, this tepid receptivity is due to budget reductions which have been significant as well as with the lack of clarity as to what these approaches and research reforms will achieve, particularly in terms of improved operations and reduced costs. Conversely, researcher frustration with this lack of receptivity is also evident in the literature. The issues on both the research and practitioner sides need to be understood in order for this study’s research methodology to be both sustainable and relevant.

1. Policing research issues.

Researchers and police practitioners recognise the opportunities inherent in creating a connected relationship. Police Practice and Research: An International Journal (Volume 11, Issue 2, 2010) devoted an entire issue to the topic. The issue was largely in response to an article by Bradley and Nixon titled Ending the ‘dialogue of the deaf’ (Bradley & Nixon, 2009). Reviewed were the two current police research traditions: critical police research and policy police research, as they have evolved in the US, UK, and Australia with the suggestion that a new approach of close and continuous collaboration had merit. While selecting researchers who had prior experience with
successful police/practitioner collaborations, the responding articles reflect the many research challenges ahead. Some of these challenges include:

- The ability of researchers to learn “...about the importance of producing timely, policy-relevant, and readable research findings for local practitioners and national policymakers” (Rosenbaum, 2010, p. 148).

- The observation that little in the way of institutional and operational change in policing has been accomplished in the past 25 years (Kennedy, 2010).

- The need for incremental as opposed to revolutionary improvements and, as an approach, the provision of detailed call information by address by type of problem to police officers, recognising that traditional patrol functions are at the core of police work (Hoover, 2010).

- The need for a research agenda that pursues that which is meaningful to police in addition to having a theoretical base; incorporating the police into the crafting of the research; the building replication into the original research design; and the improvement of transfer of knowledge developed from a cooperative approach (Buerger, 2010).

And finally, the considered observation that policing is not simple and that research and practice needs to reflect that.

Contrary to popular impressions, the police do not deal with a monolithic crime problem that can addressed by a few broad strategies well and faithfully executed. Rather, the reality of policing is that it entails dealing with hundreds of discrete public safety problems, many of which are quite complex and difficult to address. Accordingly, no more than one would expect physicians to know how to treat thousands of different diseases and forms of injury without benefit or careful research into the causes and cures for each of them, should we expect the police can effectively address the hundreds of crime and disorder problems they confront without a solid understanding of each of them, an understanding that can only be derived through careful inquiry. And it is on this count that police practitioners and scholars alike have erred for a long time: imagining that policing is simpler and easier than it truly is (Scott, 2010, p. 97).
Other researchers encourage not only collaboration but even more proactive approaches from the researcher’s point of view. Some of these are described more comprehensively by Marco Busi and include the need to take “The Customer’s” view and how to change/influence behaviour, with the customer being the recipient of the research benefits (Busi, 2013). Gravelle and Rogers speak of the “customer” from the perspective of those receiving police services (Gravelle & Rogers, 2012, p. 309). Baker and Hyde (2011) discuss a more market like approach to policing where the community has input into service provision. This approach is reflected by Burn (2010) in describing the New South Wales Customer Service Programme. These customer perspectives are important considerations in determining what research is relevant and the ultimate use to which it will be put.

Thus not only what is studied but its utility is an important research design consideration in policing, as is the relationship between researchers and the police. This researcher has observed that the notion of relevance should extend more broadly to considerations such as organisational size, operating climate, and the nature of police organisations. For example, policing research needs ideally to result in outcomes that have broad utility to small agencies as well as large (Cody W. Telep & Weisburd, 2012). In another observation, policing research which is designed as an integral part of existing operations is preferable to research that “adds on” layers of structure and process, and subsequently requires additional resources to maintain.

2. **Robustness of the policing institution.**

Policing is, by definition, a robust institution. From a structural design perspective, robustness results in specific characteristics that also transfer to the organisations within that institution.

Robustness in an organization introduces redundancies in task-resource allocation resulting in a stable organization with respect to environmental perturbations and/or decision processing errors. Evidently, this insensitivity results in slightly degraded performance on each specific mission, but minimises the organization’s fragility (Levchuk, Meirina, Pattipati, & Kleinman, 2001, p. 2593).
Levchuk et al. also point out that from a design perspective, robust institutions are different in design from adaptive institutions and that there are performance trade-offs between the two.

Shepsle (1989) recognises that there are both structural and procedural aspects to robustness. Exogenous and endogenous transformational events also occur over time with transaction costs associated with these changes. The robustness of an institution provides some insulation to change.

In terms of institutional robustness, the transaction costs of change provide an institution with something of a cushion, giving it the stability it might not otherwise enjoy in a transaction-cost-free world. Thus, even when institutional arrangements are not optimally suited to a given environment, they may nevertheless endure because prospective gains from change are more than outweighed by the costs of effecting them. In a world full of uncertainty about future states, imperfect information and a modicum of risk aversion of participants may make that cushion substantial (Shepsle, 1989, p. 144).

The process of effecting change in robust institutions is particularly complex because these institutions are not designed to be adaptive or evolutionary. Unfortunately, the policing institution’s slow pace of change, and the commensurate slow rate of change with many of the police organisations within that institution, is often attributed by researchers and the public to intransigence and cultural resistance by the police (D. Allen & Karanasios, 2011, p. 88; Ashby, Irving, & Longley, 2007). Darroch and Mazerolle (2013) encapsulate the challenges in their discussion of police receptivity to innovation.

Historically, police innovation is especially troubled by resistance to reform (Etter, 1995; Finnane, 1999; Ford, 2002; Goldstein, 2003; Mastrofski, Uchida, Fyfe, Skolnick, & Sherman, 1993; Scott, 2003; Skogan, 2008; Zhao, Thurman, & Lovrich, 1995), a tendency to adopt innovations superficially (R. Y. Allen, 2002; Weisburd et al., 2003), tensions between frontline officers and managers (Reuss-Ianni, 1993), and a conservative police culture (Chan, 1997; Foster, 2003). Research also shows that police organizations are unwilling to adopt strategic
An alternative view, and the one proposed for use in this research, is that the robustness of the policing institution in the US, UK, and Australia that has resulted in a stable, monolithic, and sustainable, albeit sometimes frustrating institution to outsiders, is far more desirable than a fragile one. Thus from a research design perspective, institutional robustness needs to be addressed, with the objective being to accommodate it in the research design. Minimalist research design changes to the police organisation’s existing structure, process, and personnel are expected to be less disruptive; be better received by police, both managers and frontline officers alike (Willis et al., 2010); and, are incorporated into the design of this study.


While researchers have observed a need for relevance and refocusing of policing investigation, police practitioners in the current economic climate have either continued blithely unaware of the research or, when aware, resorted to a bunker mentality, reverting to traditional command and control operations (if they ever moved off command and control in the first place). The benign neglect to Homeland Security (US) imperatives observed by Ortiz et al. (2007) is comparably reflected in policing’s overall receptivity and integration of research findings.

Aside from the institution’s inherent robustness, good reasons exist for this inertia. This researcher proposes that the primary reason is research relevance, as described above in relationship to past research undertakings. But a more troubling aspect of relevance is that what research is undertaken, is undertaken in policing organisations that are not apposite. For example, most police agencies are small and/or operate in a primarily suburban or rural environment. Of the 10,826 city agencies in the US for whom full time law enforcement employees are reported, 70% serve populations under 10,000 and 85% serve populations under 25,000 (US Federal Bureau of Investigation, 2012). A sample research comparison is the results of the Campbell Collaborative systematic review of problem-oriented policing (Weisburd et al., 2010). Ten eligible studies were identified from eight different US cities and six wards in the UK. Nine involved large metropolitan police agencies.
Another observation is many research topics do not resonate with the majority of police agencies. Topics of gun violence, drug markets, violent places, street prostitution and the like are exciting for researchers, but not the stuff that consumes the resources of the majority of police organisations. What consumes the majority of police agency workload is almost universally non-criminal.

Darrell Stephens, a past police chief and CEO of the Police Executive Research Forum in the US, observes that the research outcomes and publication of those results need to be sensitive to the risks and politics surrounding police departments as well as being presented in a operational useful way (Stephens, 2010). His observations related to the impact of research on operational practices are an important caution for researchers.

One of the most difficult areas for police departments is when the research design calls for a significant change in operational practice. That increases the difficulty of participation in the project because of all the issues associated with organizational change. In some cases researchers want a special unit created to focus exclusively on the subject of the research. In other cases there are expectations that officers be reassigned to other areas or times of the day. There are circumstances when these types of changes are required but it should be understood that complicates the entire process and departments may get caught up in controversy that has a negative impact on the entire project. To the extent possible, researchers should look for partners who are already doing what they want to study or want to and haven’t yet made the change (Stephens, 2010, p. 153).

While internal police researchers may have a better view of operations, their research may be affected by political forces, including not only a non-rigorous design but also manipulation of the results (Davis, 2010). Davis also observes that academic professionals’ work may be “too theoretical or too long term to be of practical use” (Davis, 2010, p. 129).

In that vein Boba introduces the concept of “practice-based evidence” (Boba, 2010). The evidence-based policing model is a strongly emergent and debated approach that is discussed more fully in the Evidence-based policing (p. 28). Succinctly defined, evidence-based policing “is the use of the best available research on the outcomes of
police work to implement guidelines and evaluate agencies, units, and officers” (Sherman, 1998, p. 3). Boba offers the complementary practice-based concept. “Practice –based evidence shares the basic idea with evidence-based practice that policy and practices should be directed by theoretical constructs and systematic evidence; however, the difference is that ‘practice’-based evidence is collected from routine practice and not from artificially constructed research studies” (Boba, 2010, p. 123). In short, the gold standard of research, the random control trial (RCT), may produce research outcomes that are not, in the end, practical.

This view is also advanced by Innes and Everett (2008). In addition to being critical of the passive notion of evidence-based policing where police practitioners are the recipients of gold standard research, Innes and Everett state that the collaboration needed is more than communications.

It is unlikely that a change in communication between researchers and practitioners will eliminate all the difficulties inherent in formulating justice policy, but we might hope it would help discourage the worst abuses. This is part of the reason that communication, in and of itself, is seldom the solution. Researchers, for instance, frequently prescribe more communication with practitioners so researchers can convince practitioners of the value of research. Less often do researchers resolve to listen better in order to appreciate the value of practice (Innes & Everett, 2008, p. 53).

Divergent needs from a research and police operations perspective also confound the collaborative process. One manifestation of these divergent needs is the plethora of contemporary policing approaches. Those reviewed in Contemporary policing approaches and theoretical bases (p. 20) include: third party policing, community policing, hot spots policing, pulling levers policing, intelligence-led policing, problem oriented policing, broken windows policing, Compstat, evidence-based policing, intelligence-led policing, and SMART policing. These are the more contemporary or high profile approaches. There are others. Even for an informed police practitioner, this is confusing. For the uninformed, it is overwhelming. Kerlikowsk and Beal, informed practitioner and researcher collaborators, suggest the following:
Perhaps ‘we should put to bed the era of community policing’ (Kerlikowske, 2004, p. 8) and, by extension, problem-oriented policing, intelligence-led policing, and all the other adjective-laden kinds of policing. It might be time to stop with the new forms of policing that repudiate older methods and incorporate ‘what we learned in this business over the last half century and call it policing’ (Beal & Kerlikowske, 2010, p. 9).

The public is not persuaded by the silver bullet claims of these various approaches, either. In a newspaper article titled “A hot spot for policing goes cold” Bill McClellan, an experienced police reporter with the St Louis Post Dispatch, provides a synopsis of a recent St. Louis police press release attributing to hotspot policing the observed downward crime trends. McClellan then visited one of those hot spot locations. His report portrays community residents involved in a much more complex dynamic than the simplistic view contained in the police press release (McClellan, January 15, 2014).

Another consideration is the volume and quality of the research available to police practitioners. A number of important meta analyses have been conducted recently. For example, from an evidence-based policing perspective, the Evidence-based Policing Matrix describes those parameters that appear to be more promising in reducing crime (Lum, 2009). However the categorisation of 92 police studies also indicated that a large number of studies had no effect or actually increased crime. In a Campbell systematic review of the effectiveness of problem-oriented policing, Weisburd et al. (2010) identified only ten of 5,500 articles and reports that were methodologically rigorous. Encouragingly, efforts are being made within the research community through such reviews to identify what works. However, this does not obviate the past practice of publicising research that appears to have achieved important outcomes only to discover years later that these outcomes may not have been actually obtained.

An important police practitioner issue is the political environment in which police organisations function. The politics often drive police organisations in directions that are counter theoretical. Braga and Weisburd (2010, p. 54) observe that of “the major police innovations of the last decade, what is most striking from a criminologists perspective is the extent to which new programs and practices have been developed without reference to either criminological theory or research evidence”. Policy decisions have been affected by the same lack of rigor.
There are many recent examples of highly contested criminal justice issues in which the argument could be made that public fear and absence of a clear understanding of the body of relevant research conspired to produce dubious policies: popular three-strike sentencing plans, mandatory sentences for drug offenses and the special attention given to crack cocaine, some domestic violence interventions, general approaches to white collar and corporate crime, and correctional innovations such as boot camps or community programs like DARE (Innes & Everett, 2008, p. 53).

Another aspect of the effect of politics and public policy on policing research is financial. From a budgetary perspective, US and UK agencies are facing significant budget reductions. Strategies advocated to meet these reductions are reducing costs, managing demand, revaluing policing and re-engineering operations (Gascon & Foglesong, 2010). Internal research funding is strained.

External funding is likewise reduced and, even when available, sometimes problematic. The SMART Policing Initiative discussed in SMART Policing Initiative (SPI) (p. 39) mandates researcher partnerships. While commendable in its efforts to advance the notion of research/practitioner collaboration, these forced relationships have been uneven in their quality (Coldren et al., 2013, p. 280). In other instances where research funding is available, that funding is tied to proscriptive requirements that are not responsive to research or practitioner issues. For example in the US, Byrne Grants provide funding and specific guidance as to how that funding can be used. That guidance in and of itself has resulted in unintended consequences, e.g. a police focus on arrest and prosecution of offenders such that the US now has too many offenders expensively locked up (The Economist, 30 November 2013). This grant focus is now being questioned in the US Congress. A final problem attendant with research funded projects is that when the funding ends, all too often... so does the project.

4. **Applied research design considerations.**

Much more can be said about the above issues. However, this thesis is not intended to investigate these issues comprehensively but, rather, to identify the most salient for the purpose of informing this study’s design. Table 7 summarises this section and provides specifications that will be acknowledged in Research Design and Methodology (p. 94).
### Table 7. Applied Research Design Considerations

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<th>Research Design Specifications</th>
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<tr>
<td>1.</td>
<td>The research design should be relevant to the current climate of policing in the US, UK, and Australia. This would indicate a design that is low or no cost to implement and maintain.</td>
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<tr>
<td>2.</td>
<td>Collaborative discussions should be undertaken with the police involved in the proposed research to identify opportunities, issues, and concerns prior to study design.</td>
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<tr>
<td>3.</td>
<td>The research design should address a contemporary issue previously identified by the police organisation.</td>
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<tr>
<td>4.</td>
<td>The research design should contain sufficient information to be comprehensible, maintainable and replicable.</td>
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<tr>
<td>5.</td>
<td>The research design should recognise the robustness of the policing organisation and integrate easily, from a systems and process perspective, with existing operations.</td>
</tr>
<tr>
<td>6.</td>
<td>The research design should be sustainable in terms of relevance to the police organisation and the resources required to continue or replicate the work.</td>
</tr>
<tr>
<td>7.</td>
<td>Data used should be “practice-based” and consistent with normal police operations (Boba, 2010, p. 23).</td>
</tr>
<tr>
<td>8.</td>
<td>The language used should be consistent with practitioner terminology and accessible.</td>
</tr>
<tr>
<td>9.</td>
<td>The research design should ensure that the researcher maintains an arm’s length relationship to the operational implementation of the research.</td>
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### I. Chapter Summary

The research statements are presented below for ease for reference:

- To determine whether the IAD framework can be used to explore the behaviour of the police and the public in collective-choice social dilemmas.
• To determine how rational choice theory, bounded rational choice theory, and the emerging behavioural theory of human interaction describe the observed behaviour of police in an endogenous collective-choice social dilemma (amongst police officers)

• To determine how rational choice theory, bounded rational choice theory, and the emerging behavioural theory of human interaction describe the observed behaviour of police and public in an exogenous collective-choice social dilemma (between police and the public)

• To determine whether collective action and collective choice explain the observed phenomenon of “shallow problem solving.”

The Literature Review has identified a number of factors that need to be reflected in the research design, methodology and procedures. First, the study needs an epistemological, ontological, theoretical, and methodological connection, and that this connection should be complemented in the research design by a flow from framework, to theory, to modelling. The institutional aspect of the first research statement is important in this regard. While the actual study addresses only a small area of inquiry, in order for the study to be analytically and empirically relevant, that inquiry must be considered not in relationship to a fragmented part of the institution but, rather, to the institution as a whole.

The theoretical questions raised in the second and third research statements need to guide the research design in a way that provides a replicable methodology and provides outcomes that assist in exploring these questions. That methodology also needs to be mindful of the current best practices in social science research. It also needs to be mindful of the requirements of the applied requirements of the study sites, with Table 7 providing the design, methodological, and procedural specifications from that viewpoint. Research Design & Methodology (p. 94) responds to these requirements.
CHAPTER 3. RESEARCH DESIGN & METHODOLOGY

A. Introduction

The Western Australia Police (WA Police) is the policing organisation within which the research has been conducted.

The design of the study uses the Institutional and Development (IAD) framework generally with the policing institution and specifically within the WA Police organisation. The study design uses the action arena and action situation components of the IAD framework to create models for use within the applied setting. These models then allow for inquiry into collective action, collective choice, and the choice theories that explain the observed behaviours of police and non-police participants. The animating aspect of the study is provided by targeting addresses with repeat calls for service.

This chapter is structured to provide background information as to the connectivity of design, methodology, and theory to the research statements, as well as special considerations related to this study. The chapter begins by reviewing the paradigm assumptions for the study. A discussion of the study setting and participants follows. The practical considerations of the applied study are reintroduced with actions that address these. An overview of the research design is followed by specifics of design, methodology, and procedures. A data collection and analysis plan explains how data from the model implementation will be collected and analysed. Finally, the cost of the study is presented as well as a summary of the chapter.

B. Epistemic and Ontological Assumptions

The IAD framework (Figure 11) serves as the ontological framework for this study (Poteete et al., 2010, p. 233). As early as 1982 Ostrom argued that the positivist (objectivist) versus interpretivist (subjectivist) dispute had overshadowed the more pressing issue of the role of research in contributing to theoretical development (E. Ostrom, 2014b). Also at about this time, Morgan and Smircich offered a table titled the “Network of Basic Assumptions Characterizing the Subjective – Objective Debate
within Social Science” that organised core ontological assumptions, assumptions about human nature, basic epistemological stance, and research methods. The table comprehensively describes the ontological, epistemological, and methodological fragmentation characterising the debate (Morgan & Smircich, 1980, p. 492). The logical positivists’ view was one of fundamental unity of the scientific method across the natural and social sciences (Moe, 1979, p. 216). This positivist view was generally accepted in political science (and many other social sciences) and the research discussion became one of discovering empirical regularities. This in turn resulted in an increased focus on methodological questions. While methodological questions are important, their dominance placed “the questions of how to describe political relationships in a quantitative manner above how to gain an adequate understanding of the processes involved in the relevant world of inquiry (E. Ostrom, 2014b, p. 215). The polarisation of the positivist versus interpretivist debate also ignores the richness of other traditional research methodologies as well as emerging methodologies that do not neatly fit within the debate’s boundaries (Crothers & Platt, 2010; R. Wilson, 2011).

![Diagram of Exogenous Variables and Action Arena](image-url)

**Figure 11. A Framework for Institutional Analysis (E. Ostrom, 2005, p. 15)**

The complementary basic epistemological problem was that in theorists’ quest for a single, simple, general model, that they increasingly distanced themselves from ‘reality.’ Theory became confined to doctrine. “Model-thinking” was based on models that were bounded by limiting assumptions yet which were presumed to have universal application. “Model-thinking may serve the purposes of rigorous mathematical reasoning but neglects empirical ‘realities’ and problematics in human affairs” (V.
Ostrom, 2014, p. 250). V. Ostrom posited that an epistemic element was required within the general ontological framework to represent common knowledge and communities of shared understanding in decision situations (V. Ostrom, 2014, p. 255).

The development of the IAD framework was a response to these ontological and epistemological concerns. The methodological implications of the framework do, indeed, go beyond the positivist versus interpretivist conflict by recognising that reliance on one or two methods hinders theoretical development and the accumulation of knowledge (Poteete et al., 2010, p. xxi). Methodological pluralism is advocated with the recognition that no single methodology is without its advantages and limitations. Thus as opposed to a continuum of paradigms and proposed by Morgan and Smircich (1980), the IAD framework offers an approach that enables theory development from empirical studies using the comprehensive range of existing methodological approaches, while encouraging the development of new methodological approaches to respond to the ensuing theoretical questions that develop.

An important note is that while the IAD framework emerged from the field of political science and political economics, it is intended to apply to all social sciences (E. Ostrom, 2014a). However, the development of social science research in the various fields has not been uniform with some fields lagging behind (Sabetti & Aligica, 2014). To a large degree, contemporary academic discussions in police research about ontology and methods involves ground that was covered, and resolved, in the 1980’s in the fields of economics, political science, and management. For example, the Contemporary best practices in policing research methods (p. 81) has described the current drive towards using the random control trial experimental design as the singular gold standard for policing research. This situation is reflective of the economic, political science, and management research discussions of thirty years ago which are being progressively resolved, by and large, by methodological pluralism. Also previously discussed in the Literature Review has been the need for improved connectivity between research and theory as well as between research and practice. Since what theoretical foundations exist in policing are largely derived from economic theory, the opportunity exists for disciplinary cross-fertilisation and capitalising on the research advances in other social sciences.
Thus, this study uses the IAD framework as the primary research tool. Specifically, action arenas and action situations will be used to build models. The purpose of these models is multifaceted. From a research perspective, the models will explore the mechanisms of collective action and collective choice in the police institution, including the theoretical implications of the behaviours observed. From a practical perspective, the models will address a contemporary WA Police issue, i.e. increasing calls for service and, in particular, a high number of repeat calls, as described in specific reports discussed in *Research Design, Methodology, and Procedures* (p. 108).

C. **Study setting**

Institutions are fundamentally invisible (E. Ostrom, 2010a). Alternately, organisations are visible. An organisation is “a set of institutional arrangements and participants who have a common set of goals and purposes, and who must interact across multiple action situations at different levels of activity” (Polski & Ostrom, 1999, pp. 3-4). Thus a study of the policing institution requires a visible organisation within which to test hypotheses. The Western Australia Police (WA Police) is the organisation within which this research took place. WA Police is divided into two operation commands: Metropolitan, including the Perth area, and Regional. Each command has seven “districts”, managed by Superintendents. Districts are further divided into “subdistricts” that are generally decentralised and managed by on Officer in Charge. Each subdistrict contains a number of “suburbs” that have been created based on political boundaries within the subdistrict. Districts, subdistricts, suburbs, and addresses are the primary location identifying element of the call for service data captured and used by WA Police.

The specific field sites for this research were selected by WA Police and are Regional Command, South West District, and Busselton and Collie Subdistricts. The metro command includes the wider Perth urban and suburban geography. The regional command is responsible for the rest of the state, a size comparable to half the geography of the US. The overall geography of the Regional Command and all Districts, including South West, is shown in Figure 12.

The South West District (Regional) has been selected because it was deemed to best represent a mix of city and rural subdistricts. The District is not involved now, nor in
the recent past, in any of the contemporary police approaches discussed in *Contemporary policing approaches and theoretical bases* (p. 20). This is also true of WA Police. While the term “Evidence-Based” turns up occasionally, for example in strategy documents, it is not operationalised at any observable level, including this District.

The South West District Superintendent subsequently selected Busselton (city) and Collie (rural) subdistricts for the research. The selection was intended to identify sites that were meaningful and representative of the District as a whole. WA Police’s selection was based on comparable size, workload, subdistrict informal characteristics, leadership experience, as well as the exclusion of some subdistricts as not being suitable for those same reasons. Figure 13 shows the South West District as well as the selected sites: Busselton and Collie. Since this site selection process was one of convenience the research design by definition is quasi-experimental as opposed to experimental (Creswell, 1994).

The Busselton Subdistrict encompasses the City of Busselton. Comprised of 29 suburbs, there are four suburbs that contribute approximately 86% of the calls: Broadwater, Busselton, Geographe, and West Busselton. Of the 22 sworn staff, 19 are assigned to two patrol Teams: Team One consists of ten direct service officers and Team Two of nine.

The Collie Subdistrict encompasses the Shire of Collie and consists of a Central Business District (CBD) and outlying rural areas. The CBD represents one suburb with thirteen other suburbs. Approximately 90% of the calls for service are in the CBD. Of the 15 sworn officers, both Team One and Team Two consist of five direct service officers each for shift rotation purposes.

Demographics of the selected sites are:

**Table 8. Population and Sworn Officers for WA Police (Davies, 2013)**

<table>
<thead>
<tr>
<th>Geography</th>
<th>Population (2012 estimate)</th>
<th>Sworn Officers Assigned to District Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>WA Police</td>
<td>2,421,200</td>
<td>3,464</td>
</tr>
<tr>
<td>Location</td>
<td>Population</td>
<td>Notes</td>
</tr>
<tr>
<td>---------------------------</td>
<td>------------</td>
<td>---------</td>
</tr>
<tr>
<td>Busselton (less Dunsborough)</td>
<td>31,100</td>
<td>Confidential</td>
</tr>
<tr>
<td>Collie</td>
<td>9,300</td>
<td>Confidential</td>
</tr>
</tbody>
</table>

**Figure 12. WA Police Regional Command Area**
Figure 13. South West District with Busselton and Collie Subdistricts Identified
D. Selection of study subjects

The sites selected were Busselton Subdistrict and Collie Subdistrict within the South West District of WA Police. All sworn police officers within each of the subdistricts were nominated by WA Police as study subjects. The actual participation of the subjects varied for each subdistrict as described in the Results chapter.

1. Ethical considerations.

Murdoch University requires research involving human participants to comply with the National Statement on the Ethical Conduct of Research Involving Humans. This study acknowledges and adhered to this statement and received an approval (No. 2012/035) from the Murdoch University Human Research Ethics Committee.

Also obtained was a specific approval from the Western Australia Police to conduct the research, including particular confidentiality undertakings that have been adhered to in the course of the research and reporting.

E. Practical Considerations

As presented in the Literature Review, a vibrant discussion amongst researchers has been underway with regards to how to respond to police practitioner complaints about police research. Considerations for Applied Policing Research (p. 83) explores the issues and Table 7 offers applied research design considerations. That table is expanded here and explains how this study will specifically address those issues in its design and methodology.

Table 9. Practical Research Design Considerations

<table>
<thead>
<tr>
<th>No.</th>
<th>Research Design Specifications</th>
<th>Study Research Design</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>The research design should be relevant to the current climate of policing in the US, UK, and Australia. This would indicate a design that is low or no cost to implement and maintain.</td>
<td>The project cash budget is $0.00 with police and non-police time provided as in-kind hours.</td>
</tr>
<tr>
<td>No.</td>
<td>Research Design Specifications</td>
<td>Study Research Design</td>
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<tr>
<td>2.</td>
<td>Collaborative discussions should be undertaken with the police involved in the proposed the research to identify opportunities, issues, and concerns prior to study design.</td>
<td>Preparatory discussions will be held with executives, middle managers, line supervisors, and support staff in developing the research design. The final research design will be provided to WA Police (executive, middle management, and site supervisors) for review, comment, and approval.</td>
</tr>
<tr>
<td>3.</td>
<td>The research design should address a contemporary issue previously identified by the police organisation.</td>
<td>Demand reduction and repeat calls for service have been identified by WA Police as a primary strategic issue.</td>
</tr>
<tr>
<td>4.</td>
<td>The research design should contain sufficient information to be comprehensible, maintainable and replicable.</td>
<td>The design and results are to be provided to the police in a separate document that contains sufficient information to maintain and replicate the work, with content and language that is accessible to practitioners.</td>
</tr>
<tr>
<td>5.</td>
<td>The research design should recognise the robustness of the policing organisation and integrate easily, from a systems and process perspective, with existing operations.</td>
<td>The design introduces secondary responsibilities that do not alter primary call taking responsibilities and provides continuous exit points throughout the study.</td>
</tr>
<tr>
<td>6.</td>
<td>The research design should be sustainable in terms of relevance to the police organisation and the resources required to continue or replicate the work.</td>
<td>The study has been designed to be sustainable at a low funding and resource levels and provides flexibility for growth/change.</td>
</tr>
<tr>
<td>7.</td>
<td>Data used should be “practice-based” and consistent with normal police operations (Boba, 2010, 23).</td>
<td>Data used are to be calls for service available directly from WA Police’s CAD system and also available to line officers.</td>
</tr>
<tr>
<td>8.</td>
<td>The language used should be consistent with practitioner terminology and accessible</td>
<td>The data and typology, as well as practitioner level reports, will use WA Police terminology. The study reports and information will be written in language that is accessible to police and public.</td>
</tr>
</tbody>
</table>
The research design is for no researcher presence beyond the initial start-up with an estimated total researcher presence at the site, or through communications, of less than 10 hours for the study period.

The first objective in designing this study was for it to be practically relevant to the police. Thus, since the primary responsibility of almost all police agencies is call taking, the focus of the study is on an issue in that domain. WA Police has experienced approximately a 5% growth in calls each year, an upward trend that appears to be consistent with both the US and UK. In addition, most of WA Police’s calls are non-criminal (apprx. 75% agency wide) as also appears to be consistent with the US and UK. (The word “appear” is used because total call data is not reported as a matter or course in any country. The call information needed to be inferred from research and governmental overview reports as discussed in the Introduction). Further preliminary analysis showed that of all calls, approximately 50% were to repeat (2+) addresses. WA Police agreed that this was a significant research opportunity for the agency to explore demand reduction and approved this study on that basis.

Selecting a primary operational issue (call taking) and designing the study to use the existing operational structure for that call taking both accommodate the issue of robustness of the police organisation. That is, no changes to the existing operational structure or staffing are required. The design makes clear that there is no change to primary call taking responsibilities, shift responsibilities, supervisory responsibilities, officer deployment and the host of other “business as usual” aspects of the work. In fact, “business as usual” carries on. However, when secondary, discretionary time becomes available, the design presents the opportunity to officers (and eventually community residents) to engage in collective action and choice, using discretionary time to address the problem of repeat calls for service.

Other considerations for the research design are that it involves “incorporating the police into the crafting of the research; the building replication into the original research design; and the improvement of transfer of knowledge developed from a cooperative
approach” (Buerger, 2010). The research design and methodology for this study ensure that the police are the primary agents for design and implementation at the operational level. There is no researcher involvement, participation, or presence at that operational level. The design also provides replicability because of the specificity of information provided such as: the dilemma, participants, positions, potential outcomes, action-outcome linkages, control, information, cost/benefits, and the rule change. The information and tools are developed from easily accessible sources.

The design also responds to the low/no cost requirement to implement, as a study, but also to sustain operationally. The assumption for the study is that discretionary resources are available within WA Police and that additional funding is not required. This assumption was corroborated by WA Police executives, middle managers, and line supervisors during the preliminary consultation. Research indicates that this is the case for other police agencies (Famega, 2009; Famega, Frank, & Mazerolle, 2005).

F. Research Design and Methodology Overview

The IAD hierarchical approach to institutional inquiry is: (a) IAD framework, (b) theoretical inquiry, and (c) modelling (E. Ostrom, 2005, 2011). This study will follow that approach. The research statements for this study reflect inquiry into both the application of the IAD framework as a tool for understanding the highly bureaucratised policing institution (research statement 1) but also inquire into action situations and collective action/choice within that institution. Intrinsic to the use of models is ensuring that the theoretical questions can also be explored. Models designed for this study provide for the exploration of research statements 2 and 3. The model development for this study incorporates the dilemma of reducing high repeat calls for service and inquiry into collective action as an explanation for the phenomenon of “shallow problem solving,” as identified in research statement 4.

1. IAD Framework.

The IAD framework in its simplest schematic (Figure 1) involves five components: exogenous variables, action arena, interactions, evaluative criteria, and outcomes. Exogenous variables include three primary subcategories: biophysical/material conditions, attributes of community, and rules. The most conventional use of the IAD
The framework is to analyse how changes in these exogenous variables effect the dynamics within the action arena and action situation. However, this study design will focus predominantly on the action arena and action situations to explore one of the research statements: to determine whether the IAD framework can be used to explore the behaviour of the police and the public in collective-choice social dilemmas. This action arena/situation focus is to ensure that the IAD framework can be utilised and exercised at a basic level in an institution where it has not been applied before, policing. This approach is supported by Ostrom (E. Ostrom, 2005).

![Diagram of the Internal Structure of an Action Situation](image)

**Figure 14. The Internal Structure of an Action Situation (Ostrom 2005, p. 33)**

In this study two exogenous variables, the biophysical/material conditions and attributes of the community are assumed to be fixed. Both of the study subdistricts are regional, as opposed to metropolitan, and reside within the same District. They are also relatively
homogenous from a demographic point of view although the population of Busselton is larger. In addition, the study time frame is of sufficiently short duration that significant changes in biophysical/material conditions and community attributes would not be expected.

The study will use a change in rules (see Exogenous variables: Rules) to animate the action situations and models discussed in Research Design, Methodology, and Procedures. Rules “refer to prescriptions commonly known and used by a set of participants to order repetitive, interdependent relationships.... Rules are the result of implicit or explicit efforts by a set of individuals to achieve order and predictability within defined situations” (E. Ostrom & V. Ostrom, 2014, p. 99). Of the seven categories of rules, the one to be changes will be a choice rule for each action arena.

Action arena (Figure 7) is the term used to describe where participants and an action situation “interact as they are affected by exogenous variables (at least at the time of the analysis at this level) and produce outcomes that in turn affect the participants and the action situations (E. Ostrom, 2005, p. 13).

The action arena and action situation of the IAD framework provide the basis for this study’s design (Figure 11 and Figure 14). The action situation is the focal element. In this study the action arena describes common aggregates of action situations. Three action arenas define the endogenous, exogenous, and combined aspects of the study. Within these three action arenas, multiple action situations are designed, sometimes in a sequential or nested way. The purpose of these aspects of the design to explore, in a variety of ways, the first research statement, i.e. applicability of the IAD framework to the policing institution:

- Can an action situation be used to explore inquiry into collective action and choice within a police organisation (endogenous)?
- Can an action situation be used to explore inquiry into collective action and choice between the police organisation and the public (exogenous)?
- Can multiple action situations be aggregated to understand (a) behaviours of the police and (b) behaviours of the police and public?
• Can multiple action situations be linked in such a way as to reflect practical police considerations?

2. Theory.

Rational choice, bounded rational choice, and the behavioural theory of human interaction will provide the theoretical basis for the study design. As such, the design will include action situations that meet the assumptions of rational choice theory, including situations that are well bounded and where full information is available to participants. Other action situations will be more unstructured to reflect “reality,” providing an opportunity to assess broader theoretical implications. These theoretical design considerations will provide for inquiry into research statements 2 and 3, that is:

• What theory (or theories) explain the police behaviour observed in the endogenous setting?

• What theory (or theories) explain the police and public behaviour in the exogenous setting?


The modelling for this study incorporates two major aspects: primarily the IAD framework (action arenas and situations) and secondary practical considerations. The research design consists of three models aligned with action arenas, developed specifically for this study, and described more comprehensively in Research Design, Methodology, and Procedures (p. 108). While the models provide the structure and process, they do not provide the initiating social dilemmas. To be practically and topically consistent, animation occurs by asking, in some aspect of each action situation, how repeat calls for service can be reduced. This is a contemporary practical consideration for the police. It is also a police research consideration as observed in the phenomenon of “shallow problem solving.” The models are designed to provide the information needed to explore the framework and theoretical questions above. The models are also designed to explore specifically research statement 4:

• Do collective action and collective choice explain the phenomenon of “shallow problem solving?”
In summary, framework, theory and models are nested concepts in this study. The framework contains the general variables and provides a metatheoretical language; a theory describes outcomes and the relationship of multiple outcomes; and models make precise assumptions about a limited number of variables in a theory (E. Ostrom, 2009). The design, methodology, and procedures address primarily the models for this study, with reference made to theoretical assumptions for each.

G. Research Design, Methodology, and Procedures

The IAD framework serves as the ontological framework for this study (Poteete et al., 2010, p. 233). As such the design is not framed from a positivist/interpretivist perspective but from a broader observational one. Rational choice, bounded rational choice, and behavioural choice theory will provide the theoretical basis for the research design. Models have been developed that will allow for observations as to how endogenous and exogenous choice events will occur and allow for theoretical interpretation of the observed outcomes. The primary study approach is quasi-experimental with pre and posttest measurements of either (a) the action situations within a model or (b) the aggregate results of a model, as specified in the Analysis Plan section. A secondary study consideration will be to capture information that is not quantitative, such as organisational structure and participant feedback. While this information will not rise to the level of a small-N case study, it will enrich the discussion about what will be a relatively well bounded set of events (Poteete et al., 2010).

Three models (Figure 15) were developed for this study: Model 1 – Internal (Endogenous) action arena, Model 2 – External (Exogenous) action arena, and Model 3: Combined Model 2 Nested in Model 1. The terms “internal” and “endogenous” are used to reflect that the collective action is undertaken wholly within the institution. The terms “external” and “exogenous” are used to reflect collective action that is undertaken between the institution and its public service recipients (Nissanke & Shimomura, 2013; V. Ostrom et al., 1961; Rolfstam, 2013; Shepsle, 2006).
The purpose of the three models is to allow for discrete inquiry into different action situations that are, in fact, practically linked.

- Model 1 provides the context for inquiry into endogenous development of the structure and process for the police organisation to prepare for problem solving. It explores collective action and collective choice wholly within the police organisation.

- Model 2 provides the context for inquiry into collective action and choice involving the police organisation as well residents at high call for service addresses. In this design, Model 2 is nested within Model 1. That is, Model 2 depends on the results of Model 1 in order for it to be animated.
• Model 3 represents the animation of Model 1 and 2 together, recognising that dynamism, feedback, and learning can occur in linked situations, just as they can occur in the single action situation.

Each action situation in this study is to a large degree a “black box” where the action situation is introduced and little is known, or needs to be known, about the individual participants (McGinnis, 2011a; McGovern & Yacobucci, 2008). Ostrom offers for consideration the notion that the social science researcher need not always delve into the infinite number of nested layers to understand some of the underlying components of social systems. “One can develop a good analysis of the situation..., decide what assumptions to make about the participants..., and predict the outcomes. If the predictions are supported empirically, that may be all that is needed” (E. Ostrom, 2005, pp. 7-8).

The first consideration for this study’s model development was to provide a research design and methodology that reflected “reality.” Therefore, not only did the modelling need to test a onetime event. The modelling also needed to test the dynamism of “reality” including different levels of analysis, e.g. collective-choice situations and constitutional situations. The modelling also needed to provide the capacity for feedback, learning, and replication. Thus with three interrelated models, the design became complicated. For this reason, the concept of “action arena” has been retained for this study. While E. Ostrom (2011) has most recently recommended moving away from the use of the action arena concept because of its limited applicability to the environmental collective action (SES) work, and also because the term had resulted in some confusion, it has proven to be useful here and is therefore retained.

In Figure 15 the action arenas shows multiple action situations with feedback and interaction between those situations and participants in addition to that which occurs within the individual action situation. Interactions also occur outside the action arena as a type of feedback loop where outcomes are evaluated and information recycled to the action arena, indicating a process where learning and modification may occur.

The following subsections describe each of the three study models and the characteristics of the action situations contained within each. The format of the section is to first describe each action situation, including a figure showing it isolated from the
comprehensive model (Figure 15). Next, a table shows three key aspects of each action situation:

- Description of the social dilemma
- The basic elements of each action situation including: participants, positions, potential outcomes, action-outcome linkages, control, information, cost and benefits.
- Rule change

The concept of social dilemma takes the area of inquiry from the market orientation of traditional rational choice theory to highly competitive situations that exists outside the market and which reflects the broader realities of the human experience (E. Ostrom, 2005 pp. 119-121).

Social dilemmas are defined by two simple properties: (a) each individual receives a higher payoff for a socially defecting choice (e.g. having additional children, using all the energy available, polluting his or her neighbours) than for a socially cooperative choice, no matter what the other individuals in society do, but (b) all individuals are better off if all cooperate than if all defect (Dawes, 1980, p. 169).

A social dilemma also allows for a microsituational level of analysis (E. Ostrom, 2014a, p. 193)

The basic elements are those described by E. Ostrom (2005) and include: participants, positions, potential outcomes, action-outcome linkages, control, information, and cost and benefits. These basic elements are more completely described in Action situation (p. 56). Rules are used in this study as tools to change outcomes (E. Ostrom, 2005, p. 215). The rule changes in these models are changes in (a) choice rule of (b) rules-in-use. The narrative of the subsection expands on aspects of the above key elements and also includes the procedures and instrumentation used.

1. **Model 1 – Endogenous (internal) action arena.**

Model 1, including Action Situations 1.1 and 1.2, provides the opportunity for exploring endogenous choice behaviour. That is, choice behaviour that occurs wholly within the
police organisation by members of that organisation. The Action Situation 1.1 is very well bounded and meets the assumptions of rational choice theory as discussed in *Theoretical Perspective* (p. 71). From a very simplistic viewpoint, what the study offers police participants is “more work” with no incentives or sanctions for their choice. The outcome expected from rational choice theory would be a high level of defection from the action situations and ultimately (since the models are linked) no significant change in repeat calls.

Bounded rational choice theory accommodates some of the unknowns in the action situations in that the information is incomplete. That is while there are no explicit incentives or sanctions, there may be those that are inferred by the participants. Bounded rational choice theory would expect less defections but not overwhelming compliance since, as the study progressed and no incentives or sanctions were forthcoming, the information would become more complete. The outcome expected from the output of all three models would be no change to small changes in repeat calls.

The emerging behavioural theory of human action provides for other outcomes and “views humans as adaptive creatures who attempt to do well given the constraints and opportunities of the situations in which they find themselves (or the ones that they seeks out) (Jones, 2001; Simon, 1955, 1957, 1999)” (Poteete et al., 2010, p. 222). This “doing well” would explain non-defection and indicate that other factors such as heuristics were operating. Trust, reputation, and reciprocity could also be involved. The outcomes of the Model 1 action situations will provide an opportunity to explore the theoretical implications if, in particular, rational choice and bounded rational choice theory do not explain the observed behaviours.

Model 1 presents an opportunity for the study subjects (participants) to engage in two action situations. The first action situation is the potential, within the formal bureaucratic structure and process, to create an informal organisation structure and process. The second is for the participants to select high call for service addresses that may be used for subsequent problem solving. “Problems” are defined as high call for service address locations and the terms “addresses” and “problems” are used synonymously.
Table 10. Action Situation 1.1 Elements

<table>
<thead>
<tr>
<th>ACTION SITUATION 1.1</th>
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<tbody>
<tr>
<td>SOCIAL DILEMMA:</td>
</tr>
<tr>
<td>Senior officers are presented with rolling 3 month summary of call data that shows the majority of calls for service in their subdistrict are repeat calls (2+), i.e. calls to the same address. They are asked to organise internally in their subdistrict to achieve a reduction in these repeat calls for service, including assigning responsibilities.</td>
</tr>
<tr>
<td>ACTION SITUATION ELEMENTS</td>
</tr>
<tr>
<td>Participants: All direct operations senior police officers in each subdistrict</td>
</tr>
<tr>
<td>Positions: Officer in charge, sergeants/acting sergeants</td>
</tr>
<tr>
<td>Potential Outcomes: Range from do nothing to creating an organisational chart and assigning responsibilities</td>
</tr>
<tr>
<td>Action-Outcome Linkages: Permission by the District Superintendent</td>
</tr>
<tr>
<td>Control: Autonomous with the exception that the informal organisation must be compatible with the reactive, call-taking organisational structure</td>
</tr>
<tr>
<td>Information: Summary of 3 month rolling call data, list of all addresses in the subdistrict with 2+ calls in the previous quarter; problem solving handout</td>
</tr>
<tr>
<td>Cost and benefits: No incentives or sanctions</td>
</tr>
<tr>
<td>RULE CHANGE: Senior officers are permitted to create an informal organisational structure and take responsibility for managing a part of the informal organisational structure.</td>
</tr>
</tbody>
</table>

a. Action Situation 1.1

Table 10 provides the details of Action Situation 1.1. Because the output of this Action Situation is not quantitative, the design will observationally present the result. The participants for this action situation include all direct operations senior police officers in the positions of Officers in Charge (Senior Sergeant), Sergeant, and Acting Sergeants although consultation with others was allowed. The social dilemma is described as is the rule change, which is a “choice” rule change. Participants are informed of the range
of outcomes as well as the level of control they have. They are made aware that they have the permission of the District Superintendent. Three items of information are provided. Participants are informed that there are no incentives or sanctions.

The information provided includes: (1) a summary of calls for service for the District, (2) a High Call for Service Report for the study subdistrict, and (3) a handout one side of which was a problem solving aide and the other side being a contact sheet. The District Summary (Appendix A) showed for the pretest period that 54.8% of the South West District calls were to the same address at least twice in that period and that 20% of the calls were to the same address 5+ times. The data for the two study subdistricts were: Busselton (52.6%/19.6%), Collie (48.6%/16.2%).

Table 11. High Call for Service Report Example

<table>
<thead>
<tr>
<th>Subdistrict</th>
<th>Suburb</th>
<th>Address</th>
<th>Call Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUSSELTON</td>
<td>BUSSELTON</td>
<td>Address 1</td>
<td>36</td>
</tr>
<tr>
<td>BUSSELTON</td>
<td>BUSSELTON</td>
<td>Address 2</td>
<td>26</td>
</tr>
<tr>
<td>BUSSELTON</td>
<td>WEST BUSSELTON</td>
<td>Address 3</td>
<td>18</td>
</tr>
<tr>
<td>BUSSELTON</td>
<td>WEST BUSSELTON</td>
<td>Address 4</td>
<td>16</td>
</tr>
<tr>
<td>BUSSELTON</td>
<td>WEST BUSSELTON</td>
<td>Address 5</td>
<td>12</td>
</tr>
<tr>
<td>BUSSELTON</td>
<td>WEST BUSSELTON</td>
<td>Address 6</td>
<td>12</td>
</tr>
<tr>
<td>BUSSELTON</td>
<td>BUSSELTON</td>
<td>Address 7</td>
<td>11</td>
</tr>
<tr>
<td>BUSSELTON</td>
<td>WEST BUSSELTON</td>
<td>Address 8</td>
<td>8</td>
</tr>
<tr>
<td>BUSSELTON</td>
<td>WEST BUSSELTON</td>
<td>Address 9</td>
<td>7</td>
</tr>
<tr>
<td>BUSSELTON</td>
<td>BROADWATER</td>
<td>Address 10</td>
<td>6</td>
</tr>
<tr>
<td>BUSSELTON</td>
<td>BUSSELTON</td>
<td>Address 11</td>
<td>6</td>
</tr>
<tr>
<td>BUSSELTON</td>
<td>BUSSELTON</td>
<td>Address 12</td>
<td>6</td>
</tr>
<tr>
<td>BUSSELTON</td>
<td>BUSSELTON</td>
<td>Address 13</td>
<td>6</td>
</tr>
<tr>
<td>BUSSELTON</td>
<td>BUSSELTON</td>
<td>Address 14</td>
<td>6</td>
</tr>
<tr>
<td>BUSSELTON</td>
<td>BUSSELTON</td>
<td>Address 15</td>
<td>6</td>
</tr>
<tr>
<td>BUSSELTON</td>
<td>GEOGRAPHE</td>
<td>Address 16</td>
<td>6</td>
</tr>
<tr>
<td>BUSSELTON</td>
<td>GEOGRAPHE</td>
<td>Address 17</td>
<td>6</td>
</tr>
<tr>
<td>BUSSELTON</td>
<td>GEOGRAPHE</td>
<td>Address 18</td>
<td>6</td>
</tr>
<tr>
<td>BUSSELTON</td>
<td>GEOGRAPHE</td>
<td>Address 19</td>
<td>6</td>
</tr>
</tbody>
</table>

A redacted sample High Call for Service Report (Table 11) showed the specific addresses in the subdistrict for addresses with 2+ calls in the previous rolling 3 quarter prioritised by number of calls the number of repeat calls for service in the previous three months. A rolling three months was selected in both instances for the reports because it
normalised perturbations in calls and was expected to identify high call for service addresses that had long term patterns of high calls.

Procedurally and practically, the above information is provided in a meeting setting and the language used is more informal and appropriate. Participants are told that they have permission from the District Superintendent to create an informal organisational structure that would allow them to manage the reduction of repeat calls for service. They are provided with some sample ideas, not directives, of how they could organise. The one requirement is that whatever structure/process they create needs to be compatible with the current call-taking organisation structure and that the call taking responsibilities are paramount. “Opting out” is an option.

No direct sanctions or incentives are provided. However, the indirect incentives could potentially be a reduction in repeat workload and the indirect sanctions could potentially be a perceived unwillingness to progress an activity that the District Superintendent had approved. Participants are asked also to assign responsibilities for the informal organisation that they create, which could be perceived as an indirect sanction in that the logical people for those additional responsibilities would be, at least in part, the participants themselves. The requested outcome of this action situation was an organisation chart with responsibilities that describes any choices they have made.

The problem solving aide and contact sheet are in Appendix C. For this action situation, they are provided to inform participants of the overall endgame.

b. Action Situation 1.2

Action situation 1.2 occurred sequential to 1.1 and the elements are shown in Table 12. Action Situation 1.2 Elements. The design for this action situation is a quasi-experimental pre and posttest (see Analysis Plan). The positions for this action situation being all direct operations senior police officers, although consultation with others is allowed. The range of outcomes is from “do nothing” to selecting addresses. The permission of the Officer in Charge (OIC) is explicit since the OIC is a participants. Participants were provided with a summary (Appendix A), a prioritised list of repeat call for service addresses (Table 11), and a detailed list organised by suburb and address of each call for the last three months for the subdistrict (Table 13). Participants
were asked to select addresses for the areas of responsibility resulting from Action Situation 1.1. No direct sanctions or incentives were provided. “Opting out” was an option with the same indirect incentives and sanctions as discussed in Action Situation 1.1. The requested outcome of this action situation was a list of high call for service addresses.

Table 12. Action Situation 1.2 Elements

<table>
<thead>
<tr>
<th>ACTION SITUATION 1.2</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOCIAL DILEMMA:</td>
</tr>
<tr>
<td>Senior officers are presented with detailed 3 month call data and, for each area of responsibility identified in Action Situation 1.1, are asked to select addresses where they will engage in problem solving.</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>ACTION SITUATION ELEMENTS</td>
</tr>
<tr>
<td>Participants:</td>
</tr>
<tr>
<td>All direct operations senior police officers in each subdistrict</td>
</tr>
<tr>
<td>Positions:</td>
</tr>
<tr>
<td>Officer in charge, sergeants/acting sergeants</td>
</tr>
<tr>
<td>Potential Outcomes:</td>
</tr>
<tr>
<td>Range from do nothing to selecting addresses with very high numbers of calls for service and/or very serious calls types</td>
</tr>
<tr>
<td>Action-Outcome Linkages:</td>
</tr>
<tr>
<td>Permission by the Officer in Charge</td>
</tr>
<tr>
<td>Control:</td>
</tr>
<tr>
<td>Addresses must be selected, but high level of control, essentially autonomous, in how many and which addresses are selected.</td>
</tr>
<tr>
<td>Information:</td>
</tr>
<tr>
<td>Detailed rolling 3 month call data that shows (a) specific high call for service (2+) addresses sorted by number of calls at each address, high to low, and (b) a list of all calls for the Subdistrict sorted by address showing suburb, address, type of call, priority, date, time, incident number, and whether attended.</td>
</tr>
<tr>
<td>Cost and benefits:</td>
</tr>
<tr>
<td>No incentives or sanctions</td>
</tr>
<tr>
<td>RULE CHANGE:</td>
</tr>
<tr>
<td>Senior officers are permitted to select the addresses (problems) on which they will work.</td>
</tr>
</tbody>
</table>
Table 13. Detail Call for Service Report Sample

<table>
<thead>
<tr>
<th>Subdistrict</th>
<th>Suburb</th>
<th>Address</th>
<th>Type</th>
<th>Type Description</th>
<th>Pty</th>
<th>Create Date</th>
<th>Create Time</th>
<th>IncNumber</th>
<th>Attended</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUSSELTON</td>
<td>WEST BUSSELTON</td>
<td>Address A</td>
<td>553</td>
<td>Property located/ Evidence to Collect</td>
<td>5</td>
<td>11/22/2013</td>
<td>02:49 PM</td>
<td>A</td>
<td>YES</td>
</tr>
<tr>
<td>BUSSELTON</td>
<td>WEST BUSSELTON</td>
<td>Address B</td>
<td>328</td>
<td>Disturbance</td>
<td>3</td>
<td>12/18/2013</td>
<td>06:00 PM</td>
<td>B</td>
<td>YES</td>
</tr>
<tr>
<td>BUSSELTON</td>
<td>WEST BUSSELTON</td>
<td>Address B</td>
<td>348J</td>
<td>Welfare Check</td>
<td>3</td>
<td>11/15/2013</td>
<td>03:54 PM</td>
<td>C</td>
<td>YES</td>
</tr>
<tr>
<td>BUSSELTON</td>
<td>WEST BUSSELTON</td>
<td>Address C</td>
<td>442</td>
<td>Noise Complaint</td>
<td>4</td>
<td>12/20/2013</td>
<td>09:22 PM</td>
<td>D</td>
<td>YES</td>
</tr>
<tr>
<td>BUSSELTON</td>
<td>WEST BUSSELTON</td>
<td>Address D</td>
<td>348</td>
<td>Welfare Check</td>
<td>3</td>
<td>11/14/2013</td>
<td>06:15 AM</td>
<td>E</td>
<td>YES</td>
</tr>
<tr>
<td>BUSSELTON</td>
<td>WEST BUSSELTON</td>
<td>Address E</td>
<td>553C</td>
<td>Property located/ Evidence to Collect</td>
<td>5</td>
<td>11/24/2013</td>
<td>12:31 PM</td>
<td>F</td>
<td>YES</td>
</tr>
<tr>
<td>BUSSELTON</td>
<td>WEST BUSSELTON</td>
<td>Address F</td>
<td>439J</td>
<td>Suspicious Person or Vehicle</td>
<td>4</td>
<td>12/30/2013</td>
<td>01:48 PM</td>
<td>G</td>
<td>YES</td>
</tr>
<tr>
<td>BUSSELTON</td>
<td>WEST BUSSELTON</td>
<td>Address G</td>
<td>328</td>
<td>Disturbance</td>
<td>3</td>
<td>12/7/2013</td>
<td>02:50 AM</td>
<td>H</td>
<td>YES</td>
</tr>
<tr>
<td>BUSSELTON</td>
<td>WEST BUSSELTON</td>
<td>Address H</td>
<td>228</td>
<td>Disturbance</td>
<td>2</td>
<td>12/1/2013</td>
<td>10:03 PM</td>
<td>I</td>
<td>YES</td>
</tr>
<tr>
<td>BUSSELTON</td>
<td>WEST BUSSELTON</td>
<td>Address H</td>
<td>428</td>
<td>Disturbance</td>
<td>4</td>
<td>12/11/2013</td>
<td>12:20 PM</td>
<td>J</td>
<td>NO</td>
</tr>
<tr>
<td>BUSSELTON</td>
<td>WEST BUSSELTON</td>
<td>Address H</td>
<td>328</td>
<td>Disturbance</td>
<td>3</td>
<td>12/24/2013</td>
<td>11:56 AM</td>
<td>K</td>
<td>YES</td>
</tr>
<tr>
<td>BUSSELTON</td>
<td>WEST BUSSELTON</td>
<td>Address H</td>
<td>228</td>
<td>Disturbance</td>
<td>2</td>
<td>1/28/2014</td>
<td>11:16 AM</td>
<td>L</td>
<td>YES</td>
</tr>
<tr>
<td>BUSSELTON</td>
<td>WEST BUSSELTON</td>
<td>Address H</td>
<td>328</td>
<td>Disturbance</td>
<td>3</td>
<td>1/26/2014</td>
<td>05:17 PM</td>
<td>M</td>
<td>YES</td>
</tr>
<tr>
<td>BUSSELTON</td>
<td>WEST BUSSELTON</td>
<td>Address H</td>
<td>428</td>
<td>Disturbance</td>
<td>4</td>
<td>1/1/2014</td>
<td>12:12 PM</td>
<td>N</td>
<td>YES</td>
</tr>
<tr>
<td>BUSSELTON</td>
<td>WEST BUSSELTON</td>
<td>Address H</td>
<td>428</td>
<td>Disturbance</td>
<td>4</td>
<td>1/27/2014</td>
<td>09:09 PM</td>
<td>O</td>
<td>YES</td>
</tr>
<tr>
<td>BUSSELTON</td>
<td>WEST BUSSELTON</td>
<td>Address H</td>
<td>229</td>
<td>Domestic</td>
<td>2</td>
<td>12/11/2013</td>
<td>06:01 PM</td>
<td>P</td>
<td>YES</td>
</tr>
<tr>
<td>BUSSELTON</td>
<td>WEST BUSSELTON</td>
<td>Address H</td>
<td>329</td>
<td>Domestic</td>
<td>3</td>
<td>1/30/2014</td>
<td>04:21 PM</td>
<td>Q</td>
<td>NO</td>
</tr>
<tr>
<td>BUSSELTON</td>
<td>WEST BUSSELTON</td>
<td>Address H</td>
<td>429C</td>
<td>Domestic</td>
<td>4</td>
<td>1/30/2014</td>
<td>01:18 PM</td>
<td>R</td>
<td>YES</td>
</tr>
<tr>
<td>BUSSELTON</td>
<td>WEST BUSSELTON</td>
<td>Address H</td>
<td>368</td>
<td>Mental Health Incident</td>
<td>3</td>
<td>1/30/2014</td>
<td>04:13 PM</td>
<td>S</td>
<td>YES</td>
</tr>
<tr>
<td>BUSSELTON</td>
<td>WEST BUSSELTON</td>
<td>Address H</td>
<td>412</td>
<td>Stealing</td>
<td>4</td>
<td>12/17/2013</td>
<td>09:14 PM</td>
<td>T</td>
<td>YES</td>
</tr>
</tbody>
</table>

Table 14. Action Situation 2.1 - 2.X Elements

<table>
<thead>
<tr>
<th>ACTION SITUATIONS 2.1 – 2.X</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOCIAL DILEMMA:</td>
</tr>
<tr>
<td>Using the outcomes of Action Situations 1.1 and 1.2, officers are asked to problem solve with the Residents at these addresses. Each address is an individual action situation (2.1 – 2.X).</td>
</tr>
<tr>
<td>ACTION SITUATION ELEMENTS</td>
</tr>
<tr>
<td>Participants:</td>
</tr>
<tr>
<td>Officer(s) responsible for the address, residents at the address, others as the Anonymous Positions emerge</td>
</tr>
<tr>
<td>Positions:</td>
</tr>
<tr>
<td>Police (Sergeants/acting sergeants, senior constables, and line officers who are call takers), Residents at the address, and Anonymous Positions that emerge</td>
</tr>
<tr>
<td>Potential Outcomes:</td>
</tr>
<tr>
<td>Range from increasing calls for service to no change to eliminating calls for service at an address</td>
</tr>
<tr>
<td>Action-Outcome Linkages:</td>
</tr>
<tr>
<td>Permission by the Sergeant/Acting Sergeant</td>
</tr>
<tr>
<td>Control:</td>
</tr>
<tr>
<td>Addresses are assigned to line officers and Residents are to be contacted. Otherwise, a high level of control, essentially autonomous, by all positions, in how the problem solving is undertaken. For the police, problem solving activities are secondary to primary call taking responsibilities.</td>
</tr>
<tr>
<td>Information:</td>
</tr>
<tr>
<td>Detailed rolling 3 month call data that shows (a) specific high call for service (2+) addresses sorted by number of calls at each address, high to low, and (b) a list of all calls for the Subdistrict sorted by address showing suburb, address, type of call, priority, date, time, incident number, and whether attended. Information provided monthly.</td>
</tr>
<tr>
<td>Cost and benefits:</td>
</tr>
<tr>
<td>No incentives or sanctions</td>
</tr>
<tr>
<td>RULE CHANGE:</td>
</tr>
<tr>
<td>That high calls for service at an address permits that address being identified for problem solving activities.</td>
</tr>
</tbody>
</table>
a. **Action Situations 2.1 – 2.X**

Table 1 presents the elements of these action situations. The participants are the Sergeants/Acting Sergeants with operational supervisory responsibility as well as other officers identified in Action Situation 1.1. The other participants at inception of the action situation are the residents at the addresses selected. The control factors for the police are that the addresses needed to be visited with face to face communication encouraged and also that problem solving activities are secondary to their primary call taking responsibilities. Aside from that, participants, police and non-police, have a very high level of control. The same information provided in Action Situation 1.2 above is provided to the police participants with the expectation that this information will be shared with non-police participants. No direct incentives or sanctions are provided. From the police perspective, the indirect cost and benefits are as for previous action situations. For the non-police participants, there are potential indirect incentives, e.g. the police do not come to the residence.

It is particularly important to note that this problem solving action situation is different from a reactive call taking action situation. Specifically, it is not illegal to have the police respond to repeat calls for service at an address. No criminal sanctions exist. Thus, from a power perspective, this action situation is initiated with, for the police, a very low level of power since the non-police participants have the power to “opt out.” They can ignore the police. These non-police participants include not only the residents at an address but also other participants that emerge, e.g. neighbours or regulatory agencies. Also important to note is that the calls being discussed at an address are all-inclusive and include calls ranging from violent to non-criminal.

Police participants are also provided with a two-sided handout (Appendix C). The handout includes a rudimentary problem solving diagram with scripted questions and timings that could be used but which are not mandatory. The reverse side includes a contact sheet that is also requested but not required. There are no sanctions or incentives that existed for using or ignoring the handout.

The choice rule change for this action situation is that problem solving activities are permitted for the purpose of reducing high calls for service at an address. This is a change for both police and non-police.
3. **Model 3 – Combined Model 2 nested in Model 1 and animated.**

![Diagram of Model 3: Combined Model 2 Nested in Model 1](image)

In that the outputs of Model 1 are required for Model 2, the relationship of the two models is defined as nested. These nested models could conclude and end as one-off event. Because of the proposed duration of this study (4 months), the study may exhibit this abbreviated characteristic. The purpose of Model 3 is to reflect the animation within and between these two models as well as providing the capacity for potential

---

**Figure 16. Combined Model 2 Nested in Model 1 and Animated**

In that the outputs of Model 1 are required for Model 2, the relationship of the two models is defined as nested. These nested models could conclude and end as one-off event. Because of the proposed duration of this study (4 months), the study may exhibit this abbreviated characteristic. The purpose of Model 3 is to reflect the animation within and between these two models as well as providing the capacity for potential
reiteration, expansion and replication. Figure 16 shows this animation and the potential for multiple reiterations. Model 3 also goes to the heart of sustainability in that a constitutional element exists that is external to the subdistricts and district: the Action-Outcome Linkages and permission by the Assistant Commissioner.

Table 15. Action Situation 3.X Elements

<table>
<thead>
<tr>
<th>ACTION SITUATIONS 3.X</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOCIAL DILEMMA:</td>
</tr>
<tr>
<td>Using the outcomes of Action Situations 1.1, 1.2, and 1.3, determine what happens next.</td>
</tr>
<tr>
<td>ACTION SITUATION ELEMENTS</td>
</tr>
<tr>
<td>Participants:</td>
</tr>
<tr>
<td>Officers in charge, District Commanders, District Superintendent</td>
</tr>
<tr>
<td>Positions:</td>
</tr>
<tr>
<td>Senior police management</td>
</tr>
<tr>
<td>Potential Outcomes:</td>
</tr>
<tr>
<td>Range from increasing calls for service to no change to eliminating calls for service</td>
</tr>
<tr>
<td>Action-Outcome Linkages:</td>
</tr>
<tr>
<td>Permission by the Assistant Commissioner</td>
</tr>
<tr>
<td>Control:</td>
</tr>
<tr>
<td>High level of control, virtually autonomous with the exception of required compatibility with the reactive, call-taking organisational structure</td>
</tr>
<tr>
<td>Information:</td>
</tr>
<tr>
<td>Models 1 and 2 including outcomes</td>
</tr>
<tr>
<td>Cost and benefits:</td>
</tr>
<tr>
<td>No incentives or sanctions</td>
</tr>
<tr>
<td>RULE CHANGE:</td>
</tr>
<tr>
<td>That high calls for service at an address permits that address being identified for problem solving activities.</td>
</tr>
</tbody>
</table>
a.  **Action Situations 3.X**

For this model, animation describes the active execution of the tasks and activities involved in Models 1 and 2 but also the feedback and learning that can occur over time. Some examples of how this might occur include:

- Modifying the organisational structure or updating the problem address list to reflect problems that are solved (or unsolvable),
- Dynamic interchange amongst the action situations in Model 2 including sharing of tactics and outcomes,
- Closing the loop by feeding back the outcomes of Model 2 to Model 1, and
- Potentially expanding to include different geographies and participants within the subdistrict.

The final important aspect of Model 3 is that it is linked to the constitutional situation of prescribing the use of Model 3 (and Models 1 and 2 by reference). Thus, the action-outcome linkage describes that Model 3 cannot occur without that linkage but, if that linkage exists, that Model 3 is designed to operate almost autonomously within the existing reactive, call-taking organisational structure. Because this study was only four months in length, limited information is expected to be obtained from Model 3.

**H.  Data Collection and Reports**

The quantitative data collected for the study is call for service data. The use of police call for service data is problematic in that the data may under-report or over-report the number of incidents, have inherent precision issues in terms of the accuracy of what is reported or the unavailability of what is not, “e.g., ‘Moby Dick’s Bar’ vs. ‘Moby’s’” (Sherman et al., 1989, p. 35). The strengths of the use of police call data are that it is unscreened, captures events that surveys and other data collection methodologies might miss, and are “the most extensive and faithful account of what the public tells the police about crime, with the specific errors and biases that that entails” (Sherman et al., 1989, p. 36). Another strength is that call for service data is readily available to most police agencies, rural, suburban, or metropolitan, through their automated dispatching systems.
Using a readily available data set that is consistent with police operations meets one of the practical considerations for this study.

1. **Source.**

The primary data source is a monthly Excel (.xls) data set produced by the Data Analysis section of Western Australia Police Communications Program Support. The data set results from an automated query of all calls in the WA Police database, selecting for the entire South West District. The query was designed and tested over a year prior to the beginning of the study to ensure accuracy and extracts the following information for each call:

- District, subdistrict, suburb and address
- Call type number, type description, and priority
- Date and time of the call
- Whether the call was attended (on site) or not

The data set includes all South West District calls to the Police Operations Centre (calls for service). Calls for service are defined as calls made to the Police Operations Centre (POC) by the public as well as POC calls that are initiated by the police themselves and entered into the system. Calls for service exclude calls to the Police Action Centre (calls for information, etc.). Judicial Process calls represent juvenile curfew checks being undertaken informally. These judicial process calls are removed from the data set prior to reports being created.

2. **Reports.**

The reports previously discussed in *Research Design, Methodology, and Procedures* (p. 108) are: Summary Report (Appendix A), High Call for Service Report (Table 11) and Detailed Call for Service Report (Table 13). These reports are provided the first week of each month to the study subdistricts, in both electronic and hard copy format. A rolling three month format normalises perturbations in calls and assist with identifying a long term patterns of high calls. “Problems” for this study are defined as addresses with two or more calls for service in a rolling quarter and both the Summary and High Call
for Service Reports selectively present that 2+ call data. Conversely, the Detailed Call for Service Report includes all calls over the time period.

The reports use data that is readily available from most Computer Assisted Dispatch programs. Microsoft Excel is used to sort and prepare the reports. This approach is simple, easy, and accessible to most police agencies. The reports themselves are, similarly, simple and easy to understand with a high degree of transparency. These characteristics meets the practical research design questions previously discussed. The language and format of the reports were also consistent with current operations.

3. **Typology.**

In order to more fully analyse the data, an order of magnitude for calls is necessary. Consultation with WA Police supported this view. Calls for service are not categorised by WA Police based on severity. Thus, a typology was developed in the preparatory phase of the study to allow for an assessment of severity of calls for service (Appendix B). A comprehensive list of all calls available on the dispatching system was produced. Call types were assigned to these categories by the police. Ordinal values were later assigned to the categories for analysis purposes. The categories (values) are:

- **VC(4):** Violent Crime. An incident that has or can possibly result in harm to individuals. An arrestable offence.
- **C(3):** Crime. An incident that has or can possibly result in property loss. An arrestable offence.
- **NCI(2):** Non Criminal Infringement. An incident that is not an arrestable offence but carries other sanctions such as fines.
- **NC(1):** Non Criminal. All other incidents.

### I. **Analysis Plan**

The following outlines the analysis approach for the study as well as known analysis issues and a discussion of how they will be addressed.
1. **Pretest baseline data assessment.**

After ensuring the quality of the data set, the baseline data are assessed to identify any anomalies. Descriptive statistics are provided. Comparisons of call counts and severities amongst the two study subdistricts and all other subdistricts (combined) is completed to identify any results that violate the assumptions for the parametric tests described for each Model. The analysis plan differs for each Model.

2. **Model 1.**

For Model 1, the analysis of Action Situation 1.1 includes a description of the informal organisation in the form of an organisation chart. Action Situation 1.2 has a quasi-experimental pre and posttest design. For Action Situation 1.2, the analysis will involve a means comparison of the number of calls and severity of calls of the addresses selected versus the pool of available addresses. The three comparison groups include (a) selected addresses, (b) unselected addresses, and (c) all other South West District addresses. The third group serves as a control group. Descriptive statistics are provided for each comparison and a t-test is used to compare these group means, both from a call count and call severity perspective. An effect size is also calculated.

3. **Model 2.**

The analysis of Model 2 is more problematic because its pretest data is the call count and severity of addresses selected in Action Situation 1.2. This requires a Non Equivalent Group Design (NEGD) to compare for mean changes (Rubin & Bellamy, 2012, Chapter 6). The groups are as above: selected addresses, (b) unselected addresses, and (c) all other South West District addresses. The third group serves as a control. Descriptive statistics are provided for each comparison and a t-test of mean gains is used (see Non Equivalent Group Design (NEGD) and seasonality of data). An effect size is calculated.

4. **Model 3.**

The analysis of Model is limited because of the length of the study. Data sheets were provided to participants but their return was at the discretion of the supervisors since the researcher maintained an arm’s length relationship to the study activities. Thus, the number of data sheets returned as well as the quality of the content is uneven. The
information provided will be discussed but statistical analyses are not appropriate. A closeout interview with the participants of Model 1 was also conducted and that information will be reported.

5. **Non Equivalent Group Design (NEGD) and seasonality of data.**

Calls for WA Police and the South West District vary seasonally, with strong reductions in calls observed each year from summer to winter, the timeframe for this study. A preliminary assessment of 2013 data identified that these reductions are statistically significant with the expectation that the call data during the study period would follow the same pattern. In addition, a Non Equivalent Group Design is the design for Model 2. This allows for comparisons of means the data of which is skewed at the start.

The statistical method to resolve both problems is a single factor pretest posttest gain score analysis. Also known as difference scores or change scores, gain score analysis involves calculating the pre and posttest difference and using that data as the dependent variable for the t-test or analysis of variance (Gliner, Morgan, & Leech, 2009; Sukin, 2010). This approach will limit the analysis of the data only to the pre-posttest change analysis and remove the seasonality factor confounding the raw data. The approach will also adjust for any pretest differences that are created by the selection process, eliminating any bias introduced. The gain score is then used as the dependent variable for analysis purposes.

**Gain = posttest – pretest**

Gain score analysis has regained traction in applied setting analysis after a period of being unfavourable. The primary historical objections to gain score analysis have been (1) unreliability and (2) sensitivity of regression to the mean (Allison, 1990; Sukin, 2010). Zimmerman and Williams (1982) maintain that gain scores can be reliable depending on the reliability of the experimental procedure. They further emphasise that the method “are sufficiently reliable for research purposes mainly when pre-test scores themselves are reliable” (Zimmerman & Williams, 1998, p. 350). They further conclude that in some special circumstance, e.g. where variances in pre-posttest scores are unequal and simultaneously the reliability coefficients of the scores are unequal with the same directionality, that gain scores can be reliable. That is, that variance ratios and reliability coefficients are interdependent.
Allison (1990) developed a comprehensive response to the issue of unreliability. In his response he compares the change score method and regressor variable method. Explaining Lord’s paradox, where the group results may not change but individuals within the group might, he demonstrates that the regressor variable method can give an answer that appears to be wrong where the gain score method using the same data provides an answer that appears to be right. Allison concludes that “the low reliability of change scores is irrelevant for the purpose of causal inference (Allison, 1990, p. 104).

The alternative to an analysis of gains scores is the analysis of covariance (ANCOVA). A number of reasons exist as to why this analysis method was not selected. First, it answers a different research question. The research question being asked in this study is whether the two groups (selected and non-selected problems) differ in terms of their mean change. This is a question appropriately analysed through a gain score method (Smolkowski, 2010). The ANCOVA adjusts these pre-test scores and the tests whether individuals sharing the same pretest scores improved at the same rates. ANCOVA “addresses the question of whether an individual belonging to one group is expected to change more (or less) than an individual belonging to another group, given that they have the same baseline response” (Fitzmaurice, Laird, & Ware, 2012, p. 125 emphasis in original). The authors also emphasise that while the baseline responses can be adjusted in order use the ANCOVA, that only where the longitudinal data is from a randomised trial would they recommend it (Fitzmaurice et al., 2012).

This covariate adjustment in the ANCOVA is problematic specifically in non-equivalent groups, such as those in this study. This can lead to errors where there is a treatment effect observed when none took place (Allison, 1990) and where no treatment effect was observed when there truly was a difference (Fitzmaurice et al., 2012). Oakes and Feldman (2001) discuss the relative merits of the gain score analysis and ANCOVA particularly for non-randomised pretest-posttest designs. They observe a main difference between the methods is that while the assumptions are the same, that the change scores method does not assume that pretest scores are measured without error. Their principal finding is:

that for a randomized experiment, ANCOVA yields unbiased treatment estimates and typically has superior power to change-score methods, all else equal.

However, in the absence of randomization, when baseline differences between
groups exist, we follow Allison (1990) and show that change-score models yield less biased estimates (if biased at all) (Oakes & Feldman, 2001, p. 18).

The second primary criticism of the gain score is regression toward the mean. This criticism was originally founded on the assumptions that the pretest scores and gain scores were negatively correlated (Zimmerman & Williams, 1982). However, the change can be negative, positive, or zero. Even disregarding this mistaken assumption, Zimmerman and Williams (1982) argue that gain scores can be very reliable. Another assumption was that pre and posttest data had equal variances which Rogosa (1995) argues is not an accurate assumption. He goes on to discuss how residual change scores, another data modification approach to lessen the effects of the regression problem is also very inadequate. Thus, regression toward the mean may exist using the change score method but only rarely and that such a method as ANCOVA (Allison, 1990) or residual change (Rogosa, 1995) are not satisfactory in resolving it.

The conclusion is that gain score analysis is a very acceptable analysis method particularly when pre and posttest scores do not have equal variance or equal reliability (Dimitrov & Rumrill, 2003; Sukin, 2010).

6. Effect size calculation.

Cohen’s $d$ is used to calculate effect size when the standards deviation of two groups are the same. If this homogeneity of variance assumption is met, the standard deviations are pooled and Cohen’s $d$ is used.

If the standard deviations differ and the homogeneity of variance assumption is not met, Hedges’ $g$ is used. Hedges’ $g$ accommodates groups that are dissimilar in size, as the study groups will be, at a minimum, for comparisons between the study subdistricts and all other subdistricts (combined). An unbiased version of the calculation is used (Hedges & Olkin, 1985).

$$g \approx d \left(1 - \frac{3}{4(n_1 + n_2) - 9}\right)$$
The Hedges g calculation result is then assessed using the guidelines of .2 (small effect), .5 (medium effect) and .8 large effect (J. Cohen, 1988; Pallant, 2013, pp. 250-251).

J. Budget Plan for the Study

Responding to the items discussed in Practical Considerations, the study budget is provided. The cash budget is $0.00. All resources are expected to be through in-kind time only. From a police perspective and since the activities of this study are secondary to other primary responsibilities, the police in-kind time is planned to be obtained from “down time” or from an informal reallocation of tasks. No overtime is planned. Other police contributions, e.g. data set production, is also expected to be in-kind. Non-police participants are not compensated and their time is planned as an in-kind contribution as is researcher time.

K. Chapter Summary

The preceding sections outline the research methodology and are a synthesis of three factors. First is a design that is responsive to the needs of the police organisation, That is, a design that is relevant, practical, replicable, effective, efficient, low cost and likely to be contributory as opposed to burdensome. Second is a design that explores the use of the Institutional and Development (IAD) framework using the police institution. This is a very modest application and intends to explore, in large part, whether collective action can occur within a highly bureaucratic organisation (robust) and between the police and community members. Third is the exploration of collective action and determining whether “shallow problem solving” is actually a phenomenon or, alternatively, collective action and choice in operation and unfettered by predetermined problem solving structures. The following Results chapter is responsive to all these factors.
CHAPTER 4. RESULTS

A. Introduction

The design of the study provides for three models and their embedded action situations in sequential levels of inquiry. The results are presented in those successive levels. The results section first reviews a number of data set issues. First is data quality and the steps taken to ensure same. Next are data issues, such as normality, that are observed in the data set and how they are addresses in the analysis. Third is an analysis of the baseline data set to ensure there are no pretest anomalies. Subsequently the results of each model and its action situations are presented, including a summary of results for each model. The remaining sections review observation information such as data sheets, participant observations, and a summary.

Results (p. 130) provides the specific study data, analyses and observations. Discussion and Conclusion (p. 172) provides a review of these results in relationship to the research statements.

B. Data Quality Assurance Steps

The following steps were taken with the South West District monthly data set provided by the West Australian Police (WA Police).

1. Verification of data Set.

Verification was specifically undertaken to ensure that the data set query provided all monthly data for the South West District and generally to provide a degree of quality control and assurance. To identify major problems, the data set was compared to previous rolling three month data as well as against the same time period for the previous year. For example, precipitous drops or increases in total call numbers would not be expected. Spot checks using all of WA Police data as well as South West District and subdistrict data from previous years for call types also ensured quality. Dates were checked to ensure there was a comprehensive list of dates for a given month. There was only one instance in the study where the query data set appeared to be corrupted (because the total numbers of calls were 50% of the prior month and prior year). This was a problem in transmission, not the query, and was quickly resolved.
a. Data cleansing.

Approximately 5% of data each month were only partially attributed. These were corrected if the attributions could be accurately identified. For example, an address and suburb might be given but the subdistrict omitted. Some calls were attributed in a way that would understate the number of repeat calls, for example spelling errors in the few manually entered calls. While most of the data was automatically generated, some dispatch manual entries had errors such as spelling or omissions that could easily be corrected, e.g. Moby’s Bar versus Moby Dick’s Bar. Locations were standardised. For example, Adams St & Smith Street and Smith Street & Adam St entries were standardised to the lowest alphabetic, i.e. Adam St & Smith Street. These corrections ensured that the cleansed data set could be sorted and not underreport repeat call occurrences. A final calculation of non-attributable calls in the data set provided an error percentage. A nominal 5% or less was set as the minimum standard and the resulting error number for each individual month of the study was 2% or less.

2. Data sorting and summary reports.

Next, judicial process calls were removed because they represent curfew checks undertaken as part of an informal juvenile program. Escort calls were also removed because they were exclusively police initiated for internal purposes. With the exception of judicial process and escort calls, the data set contains all the elements provided by the automated query. The data for the South West District was then sorted to determine high call for service locations. A district wide summary report was developed from this sorted data (Appendix A). A comparison of call counts and repeat calls (both 2+ and 5+) for all subdistricts individually was completed to identify any quality issues. This summary report was also distributed so that informed recipients could identify any issues, none of which were reported.

3. Subdistrict informational reports.

From this sorted data set, a sub set of informational reports was produced for the study subdistricts (Appendix A, Table 11, and Table 13). Only those addresses with 2+ calls in the pretest rolling 3 month period are included in the study and data analysis. However, visibility to all addresses was provided to the study police participants in the form of monthly high call for services addresses (2+) and detailed call for service report.
sorted by address. This comprehensive call data was provided for participant purposes but also to provide transparency and the opportunity to identify errors. No calls were identified as missing or over-reported by participants during the study.

C. **Assessment of Data by Comparison Group (Overall)**

The actual data obtained during the study presents some limitations that are addressed below.

1. **Sample not randomly selected.**

WA Police selected the two study subdistricts by convenience. Thus, the pretest data for the two studies districts is not random. In addition, participants selected repeat call for services addresses by convenience. Thus, the pretest data for Action Situation 2.1 is not random. This is often not the case in applied settings (Pallant, 2013) and no modifications have been made to the data or analytical approach to correct for this.

2. **Small n-size of each study subdistrict.**

The outcome of Action Situation 1.2 is a number of addresses selected by each subdistrict. The number of addresses selected by each was small (Busselton = 14, Collie = 17). For the purpose of comparing mean pre and posttest results for these subdistricts, the small n’s violate the assumption of normality.

A comparison of the selected problems of the two subdistricts indicates no difference in counts for Busselton (M = 6.62, SD = 4.11) and Collie (M = 6.06, SD = 8.36; t (29) = 0.22, p = 0.826, two-tailed). There is also no difference in weights between Busselton (M = 10.92, SD = 8.17) and Collie (M = 10.33, SD = 10.33; t (29) = .149, p = 0.883, two-tailed).

Methodologically, the social dilemma, action situation elements, and rule change are also identical for both subdistricts (Table 14). Thus to address the small N-size of the individual subdistricts, the study subdistrict address and call data have been combined (n=31) for the purposes of analysing Action Situation 2.1 – 2.N.
3.  **Data not normally distributed (Figure 17).**

The data for analysis is based on 2+ repeat calls for service to a specific address. All addresses with single calls at pretest are excluded from the study. The distribution of all pretest data is skewed with \( p < .001 \) using both the Shapiro-Wilk and Kolmogorov-Smirnov tests for normality. The combination of the two subdistrict selected addresses to achieve \( n > 30 \) addresses this problem. This \( n \) is considered a sufficiently large enough sample to address the problem of non-normalcy (Pallant, 2013, p. 214).

![Histogram](image)

**Figure 17. Sample Frequency Distribution Showing Unselected Call Counts**

4. **Skewed Action Situation 2.1 data.**

In the Model and Procedures description for Action Situation 1.2, participants are provided with a 3 month rolling list of addresses with 2+ calls per month during that time period. They then select those addresses for further problem solving (Model 2). Ideally the characteristics of the selected and unselected address groups would be the same and the pretest and posttest, control and experimental group design t-test analysis would be sufficient. This is not the case. The characteristics, including means and variance of the selected and unselected groups, differed significantly. The use of the gains score analysis described in *Non Equivalent Group Design (NEGD)* and *seasonality of data* (p. 126) addresses this problem in part. However, it does not
address the problem of whether the subdistrict control group now ceases to reflect a normal population.

To respond to this second issue, the pretest data will be compared amongst the two subdistricts and the larger district. This achieves two objectives. First is to ensure that the data from the two subdistricts are representative of the district data. Second is to understand if the resulting skewing of data requires additional analysis if, indeed, the subdistrict control is not representative of the district data at posttest. All other South West subdistricts combined then becomes a second comparison group and the control group.

5. **Variances are not homogenous.**

Variances are unequal in many instances. When this occurs as identified by Levene’s Test of Unequal Variances, the t-test for unequal variances is used.

![Normal Q-Q Plot of Countif Function Baseline](image)

**Figure 18. Sample Q-Q Plot Showing Unselected Address Call Distribution**
6. **Legitimate outliers exist (Figure 18).**

Outliers exist in all data sets for both subdistricts and the District as a whole. This is evidenced visually from a Q-Q Plot of each data set as well as by the 5% trim mean analysis of each: Selected (6.23 mean/5.16 trimmed mean); Not Selected (3.03 mean/2.58 trimmed mean); SW District (3.38 mean/2.86 trimmed mean). However, these outliers are legitimate and will be included in the results and analysis.

7. **Effect size.**

Standard deviations are different and group sizes are very different for all comparisons. Thus, Hedges’ g is used to calculate effect size.

D. **Baseline Data Set Analysis**

This analysis identifies the pretest data set characteristics. First the complete data set is analysed. Next the data set for each of the three comparison groups is presented: Busselton, Collie, and all other South West subdistricts (combined). The purpose of this analysis is to identify any pretest anomalies. The calls are presented as rolling three month data since this is the same format in which the instruments were prepared for, distributed to, and used by participants. All data analysis, including pre and posttest comparisons, also use three month rolling data.

1. **General characteristics.**

The initial pretest period is for the inclusive months of November 2013, December 2013, and January 2014. The data is combined for that period.

2. **Pretest total data set.**

The number of calls, less Judicial Process and Escort calls, is 9,251. Figure 19 shows that 54% of the calls were generated by these addresses in the three month period.
Figure 19. Pretest Total Calls for the SW District

There are 5,718 addresses associated with these calls (Figure 20). Some addresses received only a single call during the three month period. Others received 2+ calls. Figure 20 shows that 26% of addresses received 2+ repeat calls during that time period.

Figure 20. Total Addresses for Calls SW District
Thus, the majority of calls (54%) are attributable to 26% of addresses, with these 2+ repeat addresses averaging 3.38 calls during the pretest period.

Figure 21. Number of Calls by Type

Calls are further categorised by type using the typology (Appendix B) with these categories: violent crime (VC), criminal (C), non criminal infringement (NCI), and non criminal (NC). Viewed by type of call, the majority of calls for the District are non-criminal (Figure 21). Figure 22 shows that not only do 2+ repeat calls comprise not only a majority of total calls but the majority for each type of call as well: 57.1% (VC), 66.3% (C), 55% (NCI), and 51.4% (NC).

Figure 22. Calls by Type: 2+ Repeat and Single
3. **Pretest data set by study and all other subdistricts.**

Of the total calls for the South West District (Figure 23), 20.1% were from the two study subdistricts. The study subdistricts contain 18.3% of the total addresses for the South West District.

![Bar chart showing calls by study subdistrict](image)

**Figure 23. Calls by Study Subdistrict**

<table>
<thead>
<tr>
<th>Subdistrict</th>
<th>% of Total</th>
<th>No. of Calls</th>
</tr>
</thead>
<tbody>
<tr>
<td>Busseton</td>
<td>14.4%</td>
<td>1,334</td>
</tr>
<tr>
<td>Collie</td>
<td>5.7%</td>
<td>529</td>
</tr>
<tr>
<td>All Other SW District</td>
<td>79.9%</td>
<td>7,388</td>
</tr>
<tr>
<td>Total SW District</td>
<td>100.0%</td>
<td>9,251</td>
</tr>
</tbody>
</table>

![Bar chart showing percentage of 2+ repeat calls by subdistrict](image)

**Figure 24. Percentage of 2+ Repeat Calls by Subdistrict**

<table>
<thead>
<tr>
<th>Subdistrict</th>
<th>% of Total</th>
<th>No. of Addresses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Busseton</td>
<td>12.2%</td>
<td>699</td>
</tr>
<tr>
<td>Collie</td>
<td>6.1%</td>
<td>351</td>
</tr>
<tr>
<td>All Other SW District</td>
<td>81.6%</td>
<td>4,668</td>
</tr>
<tr>
<td>Total SW District</td>
<td>100.0%</td>
<td>5,718</td>
</tr>
</tbody>
</table>
The proportion of repeat calls for the study sites as compared to the other subdistricts is also similar (Figure 25). Figure 25 provides comparative percentages amongst the study and control subdistricts, all of which are similar.

<table>
<thead>
<tr>
<th></th>
<th>BUSSELTON</th>
<th>COLLIE</th>
<th>ALL OTHER SW DISTRICT</th>
</tr>
</thead>
<tbody>
<tr>
<td>% 2+ Repeat Calls</td>
<td>52.6%</td>
<td>48.0%</td>
<td>55.0%</td>
</tr>
<tr>
<td>No. 2+ Repeat Calls</td>
<td>702</td>
<td>254</td>
<td>4,062</td>
</tr>
<tr>
<td>No. Single Calls</td>
<td>632</td>
<td>275</td>
<td>3,326</td>
</tr>
</tbody>
</table>

**Figure 25. Percentage of 2+ Repeat Calls by Subdistrict**

<table>
<thead>
<tr>
<th></th>
<th>BUSSELTON</th>
<th>COLLIE</th>
<th>ALL OTHER SW DISTRICT</th>
<th>TOTAL SW DISTRICT</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Addresses w 2+ Calls</td>
<td>29.3%</td>
<td>21.7%</td>
<td>25.8%</td>
<td>26.0%</td>
</tr>
<tr>
<td>No. Addresses w 2+ Calls</td>
<td>205</td>
<td>76</td>
<td>1,203</td>
<td>1,484</td>
</tr>
<tr>
<td>No. Addresses w 1 Call</td>
<td>494</td>
<td>275</td>
<td>3,465</td>
<td>4,234</td>
</tr>
</tbody>
</table>

**Figure 26. Percentage of 2+ Repeat Addresses by Subdistrict**
The District pattern of a minority number of addresses having the majority of calls is consistent in the study subdistricts. The average number of repeat calls at the study subdistrict addresses is 3.4 as compared to non-study subdistricts (3.37).

A statistical analysis using an independent t-test of these pretest call and address means confirms that there is no significant difference in repeat call and address means for the study and control subdistricts. N = the number of addresses with 2+ calls. Table 16 presents the descriptive statistics for the number of calls at these addresses (counts).

Table 16. Descriptive Statistics for Repeat Calls (Counts)

<table>
<thead>
<tr>
<th>Measure</th>
<th>Busselton</th>
<th>Collie</th>
<th>All Other SW District</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>205</td>
<td>76</td>
<td>1,203</td>
</tr>
<tr>
<td>Mean</td>
<td>3.24</td>
<td>3.82</td>
<td>3.38</td>
</tr>
<tr>
<td>SD</td>
<td>3.078</td>
<td>4.690</td>
<td>3.428</td>
</tr>
<tr>
<td>Range</td>
<td>24</td>
<td>34</td>
<td>50</td>
</tr>
<tr>
<td>Min</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Max</td>
<td>26</td>
<td>36</td>
<td>52</td>
</tr>
</tbody>
</table>

Table 17 indicates no significant difference is observed amongst the three comparison groups in relationship to the mean number of calls as analysed using an independent t-test (Table 17) and Hedges’ g.

Table 17. Comparison T-test of Calls for Service (Counts)

<table>
<thead>
<tr>
<th>Measure</th>
<th>Busselton to All Other SW District</th>
<th>Collie to All Other SW District</th>
<th>Busselton to Collie</th>
</tr>
</thead>
<tbody>
<tr>
<td>MD</td>
<td>-.138</td>
<td>.439</td>
<td>-.577</td>
</tr>
<tr>
<td>T</td>
<td>-.539</td>
<td>1.056</td>
<td>-1.198</td>
</tr>
<tr>
<td>df</td>
<td>1406</td>
<td>1277</td>
<td>279</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.590</td>
<td>.291</td>
<td>.232</td>
</tr>
<tr>
<td>95% CI</td>
<td>[-.639, .363]</td>
<td>[-.376, 1.255]</td>
<td>[-1.524, .371]</td>
</tr>
<tr>
<td>Hedges’ g</td>
<td>-.041 (trivial)</td>
<td>.125 (trivial)</td>
<td>-.161 (trivial)</td>
</tr>
</tbody>
</table>
Repeat calls are further analysed by severity. The typology discussed in *Typology* (p. 124) and type categories used are listed in Appendix B. Weights are assigned to each call by type: VC (4), C (3), NCI (2), and NC (1). Table 18 presents the descriptive statistics for the weighted data.

Table 18. Description Statistics for Calls (Weights)

<table>
<thead>
<tr>
<th>Measure</th>
<th>Busselton</th>
<th>Collie</th>
<th>All Other SW District</th>
</tr>
</thead>
<tbody>
<tr>
<td>n</td>
<td>205</td>
<td>76</td>
<td>1,203</td>
</tr>
<tr>
<td>Mean</td>
<td>5.94</td>
<td>6.14</td>
<td>6.27</td>
</tr>
<tr>
<td>SD</td>
<td>5.777</td>
<td>6.681</td>
<td>6.495</td>
</tr>
<tr>
<td>Range</td>
<td>50</td>
<td>43</td>
<td>109</td>
</tr>
<tr>
<td>Min</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Max</td>
<td>52</td>
<td>45</td>
<td>111</td>
</tr>
</tbody>
</table>

Table 19 presents the t-test of the means and Hedges’ *g* amongst the two study subdistricts and all other South West subdistricts. The results indicate no significant difference amongst the study sites and other subdistricts.

Table 19. Comparison T-test of Calls for Service (Weights)

<table>
<thead>
<tr>
<th>Measure</th>
<th>Busselton to All Other SW District</th>
<th>Collie to All Other SW District</th>
<th>Busselton to Collie</th>
</tr>
</thead>
<tbody>
<tr>
<td>MD</td>
<td>-.338</td>
<td>-.130</td>
<td>-.208</td>
</tr>
<tr>
<td>t</td>
<td>-.699</td>
<td>-.168</td>
<td>-.257</td>
</tr>
<tr>
<td>df</td>
<td>1406</td>
<td>1277</td>
<td>279</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.485</td>
<td>.866</td>
<td>.797</td>
</tr>
<tr>
<td>95% CI</td>
<td>[-1.286, .610]</td>
<td>[-1.639, 1.380]</td>
<td>[-1.803, 1.387]</td>
</tr>
<tr>
<td>Hedges’ <em>g</em></td>
<td>.051 (trivial)</td>
<td>.019 (trivial)</td>
<td>.033 (trivial)</td>
</tr>
</tbody>
</table>

Levene’s Test for unequal variances is not significant in all cases, both counts and weights. This analysis by subdistrict indicates relatively consistent baseline data sets for the three comparison groups (selected, unselected, and all other subdistricts) with no
anomalies for addresses with 2+ calls, either numbers or calls (count) or severity of calls (weighted) for Busselton, Collie, and South West District.

4. **Pretest data set summary.**

A disproportionate number of addresses (26%) are associated with a majority of District calls (54%), with these addresses having an average of 3.38 calls for the rolling three month period. The calls are unequally distributed by type with non criminal calls representing 64.7% of all calls.

The analysis by subdistrict demonstrates no significant difference amongst the two study districts and control subdistricts with regard to the distribution of single versus 2+ repeat calls or address distribution. The weighted average (severity) of those calls also does not differ significantly. The number of calls and number of addresses with 2+ repeat calls for the two study subdistricts combined provide an adequate study sample, representing 21% of total calls and 18.3% of total addresses for the District.

E. **Model 1 Overview**

Model 1: Action Situations 1.1 and 1.2 are constructed to explore the behaviour of the police in an endogenous collective-choice social dilemma (Statements 1 and 2). The results presented are the outcome of police participants who are permitted to organise for the problem solving of repeat calls for service. These results include an organisation chart and a selection of problem addresses to be targeted. The results demonstrate that participants were able to organise. Participants also selected problem addresses that had significantly higher mean counts and severities than unselected addresses and all other South West District addresses. The action situation design functioned in both instances.

F. **Model 1: Action Situation 1.1 Results**

Action Situation 1.1 permitted participants to organise internally for the purpose of reducing repeat calls for service.

1. **Review of Action Situation 1.1.**

Table 10 contains the social dilemma, the action situation elements, and the rule change for Action Situation 1.1. These action situations occurred independently at each
subdistrict. For Busselton, the Officer in Charge (Senior Sergeant) as well as three Sergeants participated. For Collie, the Office in Charge (Senior Sergeant) and two Acting Sergeants participated. Their observations when presented with the rolling 3 month call data and the summary report showing the high percentage of repeat calls was confirmatory. In addition, they expressed awareness of the amount of time expended in attending to these repeat calls. They were initially unclear about their role and the permission they had been given because the situation was “different” from business as usual. All officers expressed some concerns about the level of personal risk involved. That is, when ordered to undertake tasks, they perceived their personal risks to be less than when they independently initiated a task. A period of discussion involved a clarification of the various action situation elements. Was the researcher a participant (no)? How much autonomy did they have (complete with the exception that whatever they created need to compatible with the reactive, call-taking organisational structure)? Would they be punished if they were not successful (no)?

All participants understood that the outcomes available to them ranged from doing nothing to something else. Some participants expressed concern about their ability to produce an outcome and the implications of that outcome. All were informed that they had permission from the District Superintendent to create an informal organisational structure and take responsibility for managing a part of the informal organisational structure (rule change). This information was provided in appropriate language. Participants were not shown Table 10 and the particular language in it was not used, including phrases such as “social dilemma”, “rule change”, “action-outcome linkages”, or “cost and benefits.”

Subsequent to this, all participants began to make choices about how to proceed, the structure of the organisation, individual responsibilities within it, how participants would interact, who would be consulted for additional information, and a number of other activities. Participants also took several weeks before producing a final outcome and consulted with others in the subdistrict. The final outcome for both subdistricts was an organisation chart with individual responsibilities assigned. These outcomes were different for the two subdistricts.

An interesting aspect of the organisation chart for both is that all patrol Sergeants and the Officers in Charge gave themselves responsibilities within it. The option was
available to them to structure in such a way that it would minimise their involvement, including delegating all responsibilities. However, the participants self-assigned themselves a significant role. The term “Geobeat” describes the various geographical responsibilities and was used by both study sites in naming the component parts of their organisation.

2. **Busselton Action Situation 1.1 outcome.**

Busselton created the informal organisational structure as seen in Figure 27. Busselton’s organisational structure can be characterised as a vertical or “silo” structure. Again, this structure was secondary and did not replace the formal organisational call taking structure of the subdistrict. The outcome of this action situation was the designation of four Geobeats for Senior Constables and two Geobeats for each patrol Sergeant.

Busselton has two operating shifts and two teams supervised by a patrol Sergeant. Sergeant 1 became responsible for the Busselton West Geobeat which was comprised of two smaller Geobeats: Broadwater and West Busselton. One Senior Constable was responsible for Broadwater, the other for West Busselton. Sergeant 2 became responsible for the Busselton East Geobeat comprised of Busselton and Geographe. One Senior Constable was responsible for Busselton East, the other for Geographe. Patrol Constables were considered to be pool resources and were not assigned to a specific Geobeat.

Participants indicated the following as some of the reasons for their organisation:

- A desire for the Sergeant to retain ultimate control
- A desire for Senior Constables to be given more responsibility and accountability
- A concern that assigning constables (officers) to Geobeats would be confusing to them

Busselton retained this structure throughout the course of the study.
Figure 27. Busselton Geobeats

The practical result of constables not being assigned to problems was that, effectively, they were involved only peripherally. This is measured from the number of constables who completed data sheet entries (0). Busselton Sergeants also reported that their expectation that Senior Constables would delegate responsibilities was not realised. One Sergeant stated that if he had to redo the organizational structure, he would ensure constables had direct problem responsibility. Thus, the responsibility fell primarily to the four Senior Constables.

Regardless of the responsibilities, one of the observations was the degree of “cheap talk” which “consists of costless, nonbinding, nonverifiable messages that may effect listener’s beliefs” (Farrell, 1987, p. 34; Farrell & Rabin, 1996). This “cheap talk,” a common concept in game theory, occurred orally as well as in written message, such as emails and informal sign posting. It occurred broadly amongst all the officers, from Constables to Senior Sergeant. Another observation was the informal competition that characterised the ensuing problem solving activities. These observations were made by participants themselves and are discussed more fully in Debriefing Summary (p. 166).

3. Collie Action Situation 1.1 outcome.

Collie created a matrix organisational structure as seen in Figure 28. Two Geobeats were created: Geo Team North and Geo Team South. Constables on one shift were split in that two constables (officers) had responsibilities for addresses that were ultimately
the responsibility of their Shift Sergeant. The other two constables had responsibility for addresses that were ultimately the responsibility of the other Shift Sergeant. Again, problem responsibility did not affect patrol assignments. Participants indicated the following as some of the reasons for their organisation:

- That there was good communication between the two Shift Sergeants
- The organisational structure ensured problems solving activities could be pursued during both shifts
- Officers would benefit from being directly responsible for problems

Collie retained this structure throughout the study.

<table>
<thead>
<tr>
<th>OIC</th>
<th>A/SGT 1</th>
<th></th>
<th>A/SGT 2</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Geo Team North</td>
<td>Geo Team South</td>
<td>Shift A</td>
<td>Geo Team South</td>
<td>Geo Team North</td>
</tr>
<tr>
<td>Geo Team South</td>
<td>Geo Team North</td>
<td>Officer 1</td>
<td>X</td>
<td>Officer 5</td>
</tr>
<tr>
<td>Officer 2</td>
<td>X</td>
<td>Officer 3</td>
<td>X</td>
<td>Officer 6</td>
</tr>
<tr>
<td>Officer 4</td>
<td>X</td>
<td>Officer 5</td>
<td>X</td>
<td>Officer 7</td>
</tr>
</tbody>
</table>

**Figure 28. Collie Geobeats**

All call taking officers in Collie had problem responsibilities. The degree of “cheap talk” appears to have been even broader than Busselton with almost all of the call takers involved in some way. There was also informal competition observed between the two Geobeats. Sergeants were clear about their desire to have their team be more successful than the other Geobeat. However, the competition was marked by a level of cooperation between the two groups, as evidenced from the limited data sheets. Participants also observed this informal interaction and mutual support as more comprehensively discussed in the *Debriefing Summary (p. 166)*.

Participants created an organisational structure for the purpose of reducing repeat calls. In both instances, the organisational structure was secondary to primary call taking responsibilities. For Busselton, the structure was a vertical organisation. For Collie, the organisation was a matrix structure. Participants assigned personnel, including themselves, to specific geographic areas of responsibility called Geobeats, of which Busselton designed four and Collie designed two. The Busselton design resulted in only senior officers being assigned, i.e. Senior Constables and Sergeants with remaining officers considered to be “pool” resources. Collie assigned all call takers to Geobeats. Participants assigned themselves significant responsibility in both sites and sustained their organisation throughout the study.

G. Model 1: Action Situation 1.2 Results

This Action Situation asked participants to identify target addresses from the Detailed Call for Service List (Table 11).

1. Review of Action Situation 1.2.

Table 12 contains the social dilemma, the action situation elements, and the rule change for Action Situation 1.2. While the designated positions in the action situation were the same as those for Action Situation 1.1, the participants at both sites selected a number of addresses initially. However, they then consulted with what are anonymous positions that included Senior Constables, Constables, and staff positions. The selection process took several weeks with iterations and modifications to the list made during that time period.

Participants understood that the range of outcomes could be a few problems selected to many, with low levels of severity to high. The Officer in Charge provided the action-outcome linkage for this action situation. Since this action situation followed Action Situation 1.1, the selection of addresses tied directly to the Geobeat responsibility of the participants. The concerns expressed in Review of Action Situation 1.1 (p. 142) were not voiced with the exception of some concern about what would happen if the calls were not reduced. After the final list was produced, it was made clear to participants
that they could change the list at any time during the course of the study, which they did not do.

2. Address selection.

Both Busselton and Collie selected addresses. The calls at the addresses they selected are analysed by number of calls (counts) and severity of calls (weights). The addresses selected are then compared to both the unselected calls (those remaining study subdistrict calls after the selection process) and to all other South West subdistrict repeat call addresses. Because of the small number of addresses selected by each study site (Busselton = 14, Collie = 17), the data for both sites has been combined for all further analyses (n = 31) so as not to violate the assumption of normality for parametric techniques. See *Small n-size of each study subdistrict* (p. 132) for a fuller discussion.

![Figure 29. Number of Calls by Type and Comparison Group](image)

Participants selected 31 (11%) from a pool of 281 addresses that had 2+ repeat calls from November 2013 to January 2014. Figure 29 presents the number of calls by type. Figure 30 provides a percentage distribution of the calls. The proportion of calls by type for the study groups is greater for violent crime and very low for both criminal and non-criminal calls. That is, participants selected addresses with a higher percentage of violent crime (VC) and non criminal (NC) calls when compared to unselected and all
other South West District groups. The number of criminal and non-criminal infringement calls at the selected addresses is very small, 3 and 4 respectively.

Figure 30. Percentage of Calls by Type and Comparison Group

<table>
<thead>
<tr>
<th></th>
<th>Violent Crime (VC)</th>
<th>Criminal (C)</th>
<th>Non Criminal Infringement (NCI)</th>
<th>Non Criminal (NC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selected</td>
<td>21.0%</td>
<td>1.5%</td>
<td>2.1%</td>
<td>75.4%</td>
</tr>
<tr>
<td>Not Selected</td>
<td>15.4%</td>
<td>10.6%</td>
<td>11.3%</td>
<td>62.7%</td>
</tr>
<tr>
<td>All Other SW District</td>
<td>15.6%</td>
<td>14.9%</td>
<td>9.2%</td>
<td>60.3%</td>
</tr>
</tbody>
</table>

Figure 31. Action Situation 1.2 Average Call Number

Average No. of Calls

<table>
<thead>
<tr>
<th></th>
<th>Selected</th>
<th>Unselected</th>
<th>All Other SW District</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average</td>
<td>6.29</td>
<td>3.04</td>
<td>3.38</td>
</tr>
</tbody>
</table>
3. **Comparison of call counts.**

Figure 31 presents the average number of calls for the three comparison groups: selected, unselected, and all other South West District. An independent-samples t-test compares the mean call counts. Hedges’ g calculates effect size (Hedges & Olkin, 1985).

**a. Comparison of Selected to Unselected Call Counts.**

There is a significant difference in the counts for selected addresses (M = 6.29, SD = 6.81) and unselected addresses (M = 3.04, SD = 2.77; t (31.2) = 2.63, p = .013, two-tailed). Levene’s Test of Equality of Variances identifies that variances are unequal, and therefore the t-test for unequal variances is used. The magnitude of the differences in the means (mean difference = 3.25, 95% CI: .734 to 5.775) is large (Hedges’ g = .941).

**b. Comparison of Selected to All Other South West District Call Counts.**

There is also a significant difference in the counts for selected addresses (M = 6.29, SD = 6.81) and all other South West subdistricts (M = 3.38, SD = 3.43; t (30.4) = 2.37, p = .024, two-tailed). The t-test of unequal variances is used. The magnitude of the differences in means (mean difference = 2.91, 95% CI: .408 to 5.419) is large (Hedges’ g = .819).

**c. Comparison of Unselected to All Other South West District Call Counts.**

No significant difference is observed in the call counts for unselected addresses (M = 3.04, SD = 2.77) and all other South West subdistrict addresses (M = 3.38, SD = 3.43; t (1451) = -1.47, p = .141, two-tailed). Levene’s is not significant so equal variances is assumed and the magnitude of the difference in the means (mean difference = -.341, 95% CI: -.794 to .113) is trivial (Hedges’ g = .102).

**d. Summary of Comparison Call Counts.**

Participants selected addresses with significantly higher numbers of calls when compared with (a) those addresses they did not select and (b) all other South West District repeat addresses. The unselected and all other South West District groups did not differ significantly.
4. **Comparison of call severity.**

Figure 32 presents the average weight (severity) for the three comparison groups: selected, unselected, and all other South West District. An independent-samples t-test is used to compare the call severities. Hedges’ g calculates effect size.

![Graph](image)

**Figure 32. Action Situation 1.2 Average Call Weight**

**a. Comparison of Selected to Unselected call weights.**

There is a significant difference in the mean weights for selected addresses (M = 10.58, SD = 10.69) and unselected addresses (M = 5.42, SD = 4.91; t (31.2) = 2.65, p = .012, two-tailed). Levene’s Test of Equality of Variances identifies that variances are unequal, and the t-test for unequal variances is used. The magnitude of the differences in the means (mean difference = 5.16, 95% CI: 1.192 to 9.121) is large (Hedges’ g = .885).

**b. Comparison of Selected to All Other South West District Call Weights.**

There is also a significant difference in the mean weights for selected addresses (M = 10.58, SD = 10.69) and all other South West subdistricts (M = 6.27, SD = 6.50; t (30.6) = 2.23, p = .033, two-tailed). The t-test of unequal variances is used. The magnitude of
the differences in means (mean difference = 4.31, 95% CI: .369 to 8.244) is moderate (Hedges’ g = .649).

c.  **Comparison of Unselected to All Other South West District Call Weights.**

No significant difference is observed in the weights for unselected addresses (M = 5.42, SD = 4.91) and all other South West District addresses (M = 6.27, SD = 6.50; t (1451) = -1.957, p = .051, two-tailed). Levene’s is not significant (.088) so equal variances is assumed. The magnitude of the difference in the means (mean difference = -.850, 95% CI: -1.703 to .002) is trivial (Hedges’ g = .135).

d.  **Summary of Comparison Call Weights.**

Participants selected addresses with significantly higher call weights (severities) when compared with (a) those addresses they did not select and (b) all other South West District repeat addresses. The unselected and all other South West District groups did not differ significantly.

5.  **Summary for Action Situation 1.2.**

Participants selected 31 addresses from a pool of 281 repeat (2+) addresses (11%). The addresses selected have a significantly greater number of calls than either the unselected (p = .013) or South West District (p = .024) repeat addresses. The severity of these calls is also significantly greater (p = .012 / p = .033 respectively). No statistically significant difference is observed between the unselected addresses and the South West District on either call counts or weights.

H.  **Model 1: Summary of results**

The range of permissible behaviours for both action situations was from (a) “do nothing” to (b) proceeding with collective action, making choices, and producing an output. Collective action took places during both Action Situation 1.1 and 1.2. Choices were made at this collective level and two outputs produced. For Action Situation 1.1, an organisation chart, that complemented the existing organisation chart, was produced by participants. This organisation chart identified geographic areas of assigned
individuals for responsibilities in these areas. Participants assigned themselves for significant responsibilities.

For Action Situation 1.2, participants selected high call for service addresses as, essentially, the workload for these geographic areas. Participants selected addresses that were on average significantly more complex and challenging. These addresses had a higher number of calls and more violent crime calls than the addresses that the participants did not select.

*Discussion and Conclusion (p. 172)* will explore the theoretical implications of these findings. In brief, rational choice theory and bounded rational choice theory do not explain these results. The behavioural theory of human interaction may provide a better explanation.

The discussion will also assess whether the Institutional and Development (IAD) framework was useful in the policing institution. The results of Model 1 indicate that this framework does have promise in that it provided a tool for both designing and conducting Model 1 as well as interpreting the theoretical implications of the results.

I. **Model 2 Overview**

Model 2: Action Situations 2.1 to 2.X are constructed to explore the behaviour of the police and public in an exogenous collective-choice social dilemma (Statements 1 and 3). The results present the combined outcomes of problem solving at the 31 problem addresses selected in Action Situation 1.2. The outcomes demonstrate that the police and public obtained greater than average reductions in calls in both number and severity when compared to unselected addresses and all other South West District addresses. These changes are also presented by call type using the typology.

Model 2: Action Situations 2.1 to 2.X are also constructed to explore whether officers and the public in a collective action situation can achieve changes in high repeat call for service address. This action situation is designed specifically, without the use of the SARA Model, or any other problem solving model or training. The results confirm that the collective action situation outcomes were significantly greater call reductions than comparison groups, particularly violent crime and non criminal calls.
J. Model 2: Action Situation 2.1-2.X Results

This action situation asked participants, both police and residents, to reduce the calls for service. The addresses targeted were those 31 selected in Model 1: Action Situation 1.2. As a result of the selection process, these addresses are characterised by a significantly higher number of calls and significantly more severe calls than both the unselected addresses and all other subdistricts. To recognise this Non Equivalent Group Design as well as the seasonality of the data, the analysis for this Action Situation uses a gain count method as discussed in the Non Equivalent Group Design (NEGD) and seasonality of data (p. 126).


Table 14 contains the social dilemma, the action situation elements, and the rule change for Action Situations 2.1 – 2.31. The numerical attribution has changed from “2.X” to “2.31” to reflect there are 31 individual action situations, one for each of the addresses selected. While Table 14 describes the presumptive action situation elements at the start, the character of each action situation evolved independently over time. The data sheets provided made clear there were many iterations for most action situations before the final outcome.

At the start, positions included the police, residents, and anonymous positions. The initial number of participants for each action situation was the officer responsible plus the residents at the selected address, nominally 31 each. The number of participants then expanded beyond this number to reflect, for example, that two officers might decide to work collaboratively on a problem or that there were multiple residents. From the initiation of the action situation, anonymous positions also emerged. These originally anonymous positions included other police who were not assigned to patrol and nonpolice, with multiple participants possible in both instances.

For example, an action situation that was very rudimentary might have, as participants, one police officer and one resident. An action situation that was very complex, might have multiple police officers, both direct call takes and support, as well as multiple command levels. This complex action situation might also involve multiple nonpolice,
such as residents, neighbours, private individuals (e.g., landlord), governmental representatives (e.g., Shire Planning or HomesWest public housing authority).

Information about each action situation was provided as described in Contact Sheet Responses (p. 165). The information provided on these was limited and incomplete. Of the 27% response rate for contact sheets, 42 individual nonpolice were participants in these action situations. The contact sheets plus the Debriefing Summary (p. 166) indicate that almost all patrol officers were participants in some way. For example in Busselton, even though Constables were not directly assigned responsibility for an address, many became anonymous participants as the study progressed.

Thus, the precise participants are unclear as are the actual choices made by the participants. However, what is clear is the outcome as assessed by changes in the number and types of calls at the selected addresses.

2. **Pre and posttest comparison (Counts).**

Figure 33 presents the change in call numbers for the comparison groups: selected, unselected, and all other South West subdistricts. An independent-samples t-test compares the call count mean change. Hedges’ $g$ calculates effect size.

![Figure 33. Pre and Posttest Average Change in Call Numbers](image)

<table>
<thead>
<tr>
<th></th>
<th>SELECTED</th>
<th>UNSELECTED</th>
<th>ALL OTHER SW DISTRICT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Gain</td>
<td>-3.87</td>
<td>-1.91</td>
<td>-2.08</td>
</tr>
</tbody>
</table>
a. **Comparison of Selected to Unselected Call Count Changes.**

There is a significant difference in the gain count of calls for selected addresses (M = -3.87, SD = 4.67) and unselected addresses (M = -1.91, SD = 2.23; t (31.72) = -2.31, p = .028, two-tailed). Levene’s Test of Equality of Variances is significant (.000), and the t-test for unequal variances is used. The magnitude of the differences in the means (mean difference = -1.96, 95% CI: -3.698 to -0.228) is moderate (Hedges’ g = .749).

b. **Comparison of Selected to All Other South West District Call Count Changes.**

A significant difference in mean gain is also observed for selected addresses (M = -3.87, SD = 4.67) and all other South West District repeat addresses (M = -2.08, SD = 2.60; t (30.48) = -2.12, p = .042, two-tailed). Levene’s Test of Equality of Variances is significant (.000), and the t-test for unequal variances is used. The magnitude of the differences in the means (mean difference = -1.79, 95% CI: -3.511 to -.070) is moderate (Hedges’ g = .67).

c. **Comparison of Unselected to All Other South West District Call Count Changes.**

There is not a significant difference in gain counts for unselected addresses (M = -1.91, SD = 2.23) and all other South West District addresses (M = -2.08, SD = 2.60; t (1451) = .978, p = .328, two-tailed). Levene’s Test is not significant. The magnitude of the difference in the means (mean difference = .173, 95% CI: -.174 - .519) is trivial (Hedges’ g = .067).

d. **Summary of Comparison Groups**

The mean gain change indicates a reduction in call count for the selected addresses that is significantly greater than for the unselected addresses and all other South West District addresses. No difference is observed between the unselected and all other South West subdistrict addresses.
3. **Pre and posttest comparison (Weights).**

Figure 34 presents the change in call weights for the comparison groups: selected, unselected. An independent-samples t-test is conducted to compare these groups. Hedges’ $g$ calculates effect size.

**a. Comparison of Selected to Unselected call weight changes.**

There is a significant difference in the gain change of weighted calls for selected addresses ($M = -7.16, SD = 8.87$) and unselected addresses ($M = -3.43, SD = 4.63; t (32.06) = -2.303, p = .028$, two-tailed). Levene’s Test of Equality of Variances is significant (.000), and the t-test for unequal variances is used. The magnitude of the differences in the means (mean difference = -3.73, 95% CI: -7.027 to -.432) is moderate (Hedges’ $g = .708$).

![Figure 34. Pre and Posttest Change in Call Weights](image)

**b. Comparison of Selected to All Other South West District call weight changes.**

The t-test is not significant at the 95% confidence level. The weighted call gain change for selected addresses is ($M = -7.16, SD = 8.87$) and all other South West District repeat addresses ($M = -3.97, SD = 5.35; t (30.57) = -1.99, p = .055$, two-tailed). Levene’s Test of Equality of Variances is significant (.000), and the t-test for unequal variances is used. The magnitude of the differences in means (mean difference -3.195, 95% CI: -
6.459 to .07) is moderate (Hedges’ $g = .583$). These results indicate that there is a difference between the two groups but that the difference might not generalise to a larger population.

c. **Comparison of Unselected to All Other South West District call weight changes.**

Also, there is not a significant difference in the gain change (weighted calls) for unselected addresses ($M = -3.43$, $SD = 4.63$) and all other South West District addresses ($M = -3.97$, $SD = 5.35$; $t (1451) = 1.471$, $p = .142$, two-tailed). Levene’s Test is not significant, and the equal variance t-test is used. The magnitude of the differences in means (mean difference $.535$, 95% CI: $-.178$ to $1.248$) is trivial (Hedges’ $g = .103$).

d. **Summary of Comparison Groups (Weights).**

Overall for weighted calls, reductions in call severity for selected addresses are significantly greater than for the unselected addresses. There is a difference between the selected addresses and all other South West District addresses as indicated by effect size. However, the t-test at $p=.055$ does not reach 95% and would indicate that this difference might not be observed in a larger population. Differences are also not observed between unselected gain changes and all other South West District weighted calls.

4. **Pre and posttest comparison (Types).**

This section analyses calls by type using the Typology in Appendix B. A gains count analysis method is used. An independent-samples t-test compares the mean call counts. Hedges’ $g$ calculates effect size.

a. **Violent Crime Repeat Calls.**

Figure 35, Table 20, and Table 21 indicate that the selected addresses had significantly greater reductions in violent crime calls when compared to unselected addresses as well as all other South West subdistricts, with a moderate effect size in both instances. No difference was observed between the unselected and other South West subdistricts.
Figure 35. Change in Violent Crime Calls (VC)

Table 20. Descriptive Statistics for Violent Crime Calls (VC)

<table>
<thead>
<tr>
<th>Measure</th>
<th>Selected</th>
<th>Unselected</th>
<th>All Other SW District</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>31</td>
<td>250</td>
<td>1203</td>
</tr>
<tr>
<td>Mean Gain</td>
<td>-1.03</td>
<td>-.26</td>
<td>-.32</td>
</tr>
<tr>
<td>SD</td>
<td>1.560</td>
<td>.854</td>
<td>1.018</td>
</tr>
</tbody>
</table>

Table 21. Comparison T-test of for Violent Crime Call Gains (VC)

<table>
<thead>
<tr>
<th>Measure</th>
<th>Selected to Unselected</th>
<th>Selected to All Other SW District</th>
<th>Unselected to All Other SW District</th>
</tr>
</thead>
<tbody>
<tr>
<td>MD</td>
<td>-.776</td>
<td>-.715</td>
<td>.062</td>
</tr>
<tr>
<td>T</td>
<td>-2.721</td>
<td>-2.538</td>
<td>.893</td>
</tr>
<tr>
<td>df</td>
<td>32.267</td>
<td>30.662</td>
<td>1451</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.010</td>
<td>.016</td>
<td>.372</td>
</tr>
<tr>
<td>95% CI</td>
<td>[-1.357, -.195]</td>
<td>[-1.289, -.140]</td>
<td>[-.074, .194]</td>
</tr>
<tr>
<td>Hedges’ g</td>
<td>.803 (moderate)</td>
<td>.685 (moderate)</td>
<td>.060</td>
</tr>
</tbody>
</table>
b. **Criminal Repeat Calls.**

Figure 36, Table 22, and Table 23 indicate a significant difference amongst all three study groups with the gain change of selected addresses being the smallest. The effect size between select and unselected was small as was that between the unselected and all other South West subdistricts. The effects size between selected and unselected addresses was moderate.

![Bar chart showing change in criminal calls](chart.png)

**Figure 36. Change in Criminal Calls (C)**

**Table 22. Descriptive Statistics for Criminal Calls (C)**

<table>
<thead>
<tr>
<th>Measure</th>
<th>Selected</th>
<th>Unselected</th>
<th>All Other SW District</th>
</tr>
</thead>
<tbody>
<tr>
<td>n</td>
<td>31</td>
<td>250</td>
<td>1203</td>
</tr>
<tr>
<td>Mean Gain</td>
<td>-0.06</td>
<td>-0.26</td>
<td>-0.38</td>
</tr>
<tr>
<td>SD</td>
<td>0.250</td>
<td>0.738</td>
<td>0.948</td>
</tr>
</tbody>
</table>
Table 23. Comparison T-tests of Criminal Call Gains (C)

<table>
<thead>
<tr>
<th>Measure</th>
<th>Selected to Unselected</th>
<th>Selected to All Other SW District</th>
<th>Unselected to All Other SW District</th>
</tr>
</thead>
<tbody>
<tr>
<td>MD</td>
<td>.191</td>
<td>.313</td>
<td>.121</td>
</tr>
<tr>
<td>t</td>
<td>2.958</td>
<td>5.956</td>
<td>2.244</td>
</tr>
<tr>
<td>df</td>
<td>114.042</td>
<td>56.235</td>
<td>438</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.004</td>
<td>.000</td>
<td>.025</td>
</tr>
<tr>
<td>95% CI</td>
<td>[.063, .320]</td>
<td>[.208, .418]</td>
<td>[.015, .228]</td>
</tr>
<tr>
<td>Hedges' g</td>
<td>.284 (small)</td>
<td>.341 (moderate)</td>
<td>.131 (trivial)</td>
</tr>
</tbody>
</table>

c. Non Criminal Infringement Repeat Calls.

The change in selected address non criminal infringement calls was significantly less than for the other groups (Figure 37, Table 24, and Table 25) but the effect size was small.

![Figure 37. Change in Non Criminal Infringement Calls (NCI)](image)
Table 24. Descriptive Statistics for Non Criminal Infringement Calls (NCI)

<table>
<thead>
<tr>
<th>Measure</th>
<th>Selected</th>
<th>Unselected</th>
<th>All Other SW District</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>31</td>
<td>250</td>
<td>1203</td>
</tr>
<tr>
<td>Mean Gain</td>
<td>-0.06</td>
<td>-0.24</td>
<td>-0.18</td>
</tr>
<tr>
<td>SD</td>
<td>0.359</td>
<td>0.892</td>
<td>0.773</td>
</tr>
</tbody>
</table>

Table 25. Comparison T-test of Non Criminal Infringement Call Gains (NCI)

<table>
<thead>
<tr>
<th>Measure</th>
<th>Selected to Unselected</th>
<th>Selected to All Other SW District</th>
<th>Unselected to All Other SW District</th>
</tr>
</thead>
<tbody>
<tr>
<td>MD</td>
<td>.179</td>
<td>.114</td>
<td>-.065</td>
</tr>
<tr>
<td>t</td>
<td>2.094</td>
<td>1.673</td>
<td>-1.182</td>
</tr>
<tr>
<td>df</td>
<td>87.269</td>
<td>37.578</td>
<td>1451</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.039</td>
<td>.103</td>
<td>.238</td>
</tr>
<tr>
<td>95% CI</td>
<td>[.009, .350]</td>
<td>[-.024, .252]</td>
<td>[-.174, .043]</td>
</tr>
<tr>
<td>Hedges' g</td>
<td>.211 (small)</td>
<td>.157 (trivial)</td>
<td>.075 (trivial)</td>
</tr>
</tbody>
</table>

d. Non Criminal Repeat Calls.

Figure 38, Table 26, and Table 27 indicate that the selected addresses had significantly greater reductions in non criminal calls when compared to unselected addresses as well as all other South West subdistricts, with a moderate effect size in both instances. No difference was observed between the unselected and other South West subdistricts.

Table 26. Descriptive Statistics for Non Criminal Calls (NC)

<table>
<thead>
<tr>
<th>Measure</th>
<th>Selected</th>
<th>Unselected</th>
<th>All Other SW District</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>31</td>
<td>250</td>
<td>1203</td>
</tr>
<tr>
<td>Mean Gain</td>
<td>-2.71</td>
<td>-1.15</td>
<td>-1.21</td>
</tr>
<tr>
<td>SD</td>
<td>3.495</td>
<td>1.627</td>
<td>2.129</td>
</tr>
</tbody>
</table>
Figure 38. Change in Non Criminal Calls (NC)

Table 27. Comparison T-test of Non Criminal Call Gains (NC)

<table>
<thead>
<tr>
<th>Measure</th>
<th>Selected to Unselected</th>
<th>Selected to All Other SW District</th>
<th>Unselected to All Other SW District</th>
</tr>
</thead>
<tbody>
<tr>
<td>MD</td>
<td>-1.562</td>
<td>-1.503</td>
<td>.059</td>
</tr>
<tr>
<td>T</td>
<td>-2.455</td>
<td>-2.383</td>
<td>.492</td>
</tr>
<tr>
<td>df</td>
<td>31.633</td>
<td>30.576</td>
<td>446</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.020</td>
<td>.024</td>
<td>.623</td>
</tr>
<tr>
<td>95% CI</td>
<td>[-2.858, -2.265]</td>
<td>[-2.790, -2.216]</td>
<td>[-.177, .295]</td>
</tr>
<tr>
<td>Hedges’ g</td>
<td>.811 (moderate)</td>
<td>.690 (moderate)</td>
<td>.029 (trivial)</td>
</tr>
</tbody>
</table>

5. Summary for Action Situation 2.2.

Reductions in both number of calls and severity of calls is observed for the selected addresses when compared to the unselected and all other SW subdistrict addresses. By type, the reductions in violent crime and non criminal calls are both significant and have a moderate effect size.
K. Model 3 Overview and Results

Model 3 is constructed to reflect the nested Models 1 and 2 as well as reiterative use of these Models as modified by learning and feedback obtained. Because the study was of short duration (4 months), Model 3 was exercised in only one iteration. The design provides for a recursive use but in order for that recursive use to occur, a constitutional level rule change is required as described in Action Situation 3.X (Table 15). The rule change is: That high calls for service at an address permits that address being identified for problem solving activities. This Model provides an example of linking different levels of action situations (constitutional to collective-choice situations). Model 3’s dependent collective-choice action situations are dependent on the constitutional level rule change.

Simply put, the WA Police rule change in this regard was for a four month period in two subdistricts. That rule change did not extend past that time nor to other subdistricts. The value of this Model is, particularly, that it addresses sustainability. If the constitutional rule is changed, its dependent action situations continue. If it is not changed, its dependent actions situations do not proceed since they are linked. Thus Model 3 begins to provide insight into the institution as a whole. While it can be argued that Models 1 and 2 are “programs,” Model 3 provides the vehicle to begin to understand why many programs die on the vine and others do not.

Model 3 was exercised in only one iteration of its two nested models. Thus, while feedback and learning occurred as report in Debriefing), the short time frame of the study (4 months) did not allow for this feedback and learning to mature. For example, one Busselton Sergeant offered that if the study were continued, he would modify the organisational structure so that all “his” call takers were assigned problems, as was the case in Collie. The other Sergeant was not entirely persuaded that this would be an effective change. These observations argue for a continuation of the Action Situation 1.1 social dilemma and an opportunity for a second round of collective choice with regard to this Action Situation.

Another Model 3 opportunity would be for the initial problem set to be assessed and “closed” and new problem identified. This would involve a second iteration of Action Situation 1.2. A third opportunity also identified by participants was the content and
use of the data sheets discussed below. Many participants did not like completing the contact sheets and, consequently, did not complete them as discussed in Contact Sheet Responses (p. 165). However, some participants (the Supervisors) thought the contact sheets might have some use if modified, another opportunity for collective action and choice.

Thus, Model 3 appears to have potential since both its nested Models functioned well. However, in order for a fair assessment to be made, a longer study needs to occur.

L. Contact Sheet Responses

Participants were asked to complete contact sheets each week for each of their assigned addresses (Appendix C). However, there were no sanctions or incentives for so doing. Not surprisingly, compliance was uneven. The study ran for 16 weeks for 31 addresses identified, or an optimal count of 496 contact sheets. The actual number received was 138 (27%), the majority received in the first four weeks of the study and the last two weeks. The quality of the data on the sheets is also uneven.

Thus, while the contact sheets are not of a quality that they can provide data of analytic quality, they do provide some useful observational information.

- 14 officers provided at least one contact sheet
- At least one contact sheet was received for each address
- 42 residents were contacted
- Of these, 14 were contacted multiple times, ranging from 2 to 5
- A total of 162 contacts were recorded
- Anonymous positions appeared during the process. Those positions reported include neighbours, non-resident relatives, HomesWest, other police subdistricts and staff, Liquor and Licensing, women’s refuge, and landlords.
- Some of the reported resolutions were complex and involved third parties.
M. Debriefing Summary

The debriefing took place with six participants from Model 1, all Sergeants or Senior Constables. Participants were asked four questions:

- What they liked best
- What they liked least
- Suggestions for improvement
- Other observations

The responses were documented and provided for review, comments, and final approval with each of the two study subdistricts: Busselton (B) and Collie (C). Sections 1, 2, 4, and 4 contain the precise content of the final briefing responses as approved by WA Police.

1. Question: “What did you like best?”

- Supervisory aspect: more aware of the number of times officers were going to the same place (B)
- Current stats provided by WA Police do not identify addresses – the list of high call for service addresses help identify those locations without staff having to go back and research individual incidents (B)
- Opportunity for officers to take ownership of the goal of achieving reductions in recidivist calls (B)
- Lateral thinking (B)
- Lower ranks learned to communicate (B)
- Concentrated the efforts of the team (C)
- Encouraged officers to think outside the box (C)

2. Question: “What did you like least?”

- Complexity of the reporting (B)
• Did not like being encouraged to pick addresses with low levels of calls.
  Wanted to pick addresses that were harder (B)

• The guide for the timetable on problem solving was not helpful (B)

• Finding the time to do it (C)

• Didn’t like being encouraged to pick address with 2 calls per quarter.
  Wanted to select problems they thought they could do something about (C)

3. **Suggestions.**

• Change the contact sheets to free text and electronic version (B)

• Remove the structured timeframe for problem solving (B)

• Would like electronic version of forms instead of hard copy, something easier to work with (C)

• Forms required too much information (C)

• Process was too long for some of the problems (the thinking was that the suggested timeframes on the problem solving worksheet was required as opposed to suggested. This needs to be made clear in the future.) (C)

4. **Other observations.**

• The organisation of the Busselton project used S/C as prime problem solvers. This had the effect of putting these S/C in the role of leaders. This meant the S/C role would be more recognised. The agency (WA Police) has been taking autonomy out of the S/C role and the problem solving was a way of putting some of that autonomy and leadership back into that role. (B)

• There is currently a loss [lot] of knocking on doors and dealing with the community and that is exactly what needs to be done. (B)

• Because S/C’s were problem solving and talking to people, it set a role model for the Constables that face to face communication was a good thing. (B)
• S/C had the option of involving more junior staff in the problem solving effort. This provided an up skilling opportunity for S/C in terms of leadership and delegation. (B)

• The younger Constables do not have confidence in dealing with people and the opportunity was there to help them develop that confidence. (B)

• Not a huge impact on time. (B)

• There were emails and networking amongst the officers communicating plans, observations, requests and resolutions for various problems. This was done informally. (B)

• Opportunity to use the firearms audit in some capacity to encourage communications. (B)

The Discussion section more fully explores the above information in the context of the research statements.

N. **Actual Cost of the Study**

The actual police funding required was $0.00. The time and resources for all police participants in the study was provided as in-kind. The time and resources for all non-police participants was, likewise, in-kind.

O. **Summary of Results**

The Research Statements for the study are:

• To determine whether the IAD framework can be used to explore the behaviour of the police and the public in collective-choice social dilemmas

• To determine how rational choice theory, bounded rational choice theory, and the emerging behavioural theory of human interaction describe the observed behaviour of police in an endogenous collective-choice social dilemma (amongst police officers)

• To determine how rational choice theory, bounded rational choice theory, and the emerging behavioural theory of human interaction describe the
observed behaviour of police and public in an exogenous collective-choice social dilemma (between police and the public)

- To determine whether collective action and collective choice explain the observed phenomenon of “shallow problem solving.”

The summary results presented in reference to these statements are indicative of number of results. First, the IAD framework can be used as proposed. While the study model structure focuses primarily on action situations and action arenas, not incorporating the more robust aspects of the IAD framework such as its Exogenous Variables, the IAD framework provided a analysis structure that was successfully used to explore the behaviour of police, singularly, and the police/public. The bureaucratic nature of this large police organisation also did not present a barrier to collective-choice inquiry.

Second, it is clear that collective-action and choice can actually take place within the police organisation in spite of the more rigid, bureaucratic characteristics of the police organisation. And, this collective-action and choice can co-exist with the primary standard operating procedures of day to day call taking. Officers continued in their primary call-taking role but were able to organise around a social dilemma, create their own governance structure, and manage that structure without a direct link to the constitutional level of analysis. Indeed, the lack of that link provides information as to sustainability of the collective-choice action. That is, without the constitutional link, are the collective-action situations sustainable? This would be the questions reflected by Model 3. Model 3 was exercised in only one iteration. It is designed in such a way that it can be used recursively but requires a constitutional link to activate that recursivity.

In simpler language, if WA Police executive changes the rule with regards to whether the models are an accepted part of police practice (constitutional situation) then the collective-choice situations (this study) and its results would be more likely to sustained. If the executive does not change the rule, then the converse is more likely. Thus, not only does the IAD framework itself but supporting concepts like levels of analysis have proved to be useful in this study.

From a theoretical perspective, police officers in organising and selecting problems behaved in a way that provides new information about the theoretical implications of
that behaviour. For example, for the Model 1 endogenous action situations, police participants did not behave in a way that is explained by rational choice or bounded rational choice theory. When permitted to organise, but allowed to “opt out,” they organised and assigned to themselves responsibilities and work that they could have avoided. For example, Sergeants and Senior Constables could easily have designed an organisational structure that did not include them.

When permitted to select the addresses on which they would work, and again allowed to “opt out,” officers selected the more challenging addresses with high call counts and severity of calls. While the argument could be made that this choice might be police institution’s best interest, it does not necessarily follow that it is in the individual officer’s best interests. Most officers, when not responding to calls are engaged in administrative duties or random patrol which includes coffee breaks and donut stops. Random patrol is predominantly discretionary officer time. By selecting problems at all, and certainly more challenging problems, officers diminished the amount of their discretionary time. And if that effect was not clear at the beginning of the study, it quickly became clear as community contact was made. It also must be emphasised that, in fact, one of the consistent complaints during the debriefing was being guided (but not required) to select addresses with only 2 calls (see Procedures) when what they wanted to select, and actually did, was addresses that were “harder.” This fact also tends to support that the observed behaviour was not well explained by traditional policing choice theories.

In another example from Model 2 where 31 different Action Situations occurred, the contact sheets provide a small lens into what was done and much of it involved not “opting out” or going through the motions. It involved collective action and choice with not only the residents at the high call for service addresses selected but with a wide range of previously anonymous positions as well. The results themselves demonstrate that the collective action was successful even on the more challenging addresses that they selected.

Lastly, the results from collective action and choice explains the phenomenon known as “shallow problem solving.” As opposed to interpreting problem solving as a script of activities to be undertaken, which is a tidy, logical and structured approach, this study allowed for the complete opposite: untidy, vague, and unstructured. Much of what
happened during collective action and choice in the study happened within the “black box” of each model. That being said, the value of this approach is that it is simple, practical, and un-nuanced. From an applied perspective, the use of the study models might leave unanswered a number of questions, but if the outcomes are as desired, that maybe enough.

In conclusion the results indicate that the IAD framework, albeit only in a limited application, appears to be applicable to the policing institution in that it was a productive framework for this study. The results challenge, and not unexpectedly, the theories of rational choice and bounded rational choice that are the primary theories use in police research. Lastly, collective-action and choice explain the phenomenon of “shallow problem solving” and have practical utility.
CHAPTER 5. DISCUSSION AND CONCLUSION

A. Introduction

The summary of results in relationship to the research statements is as follows:

- The IAD framework can be used successfully to explore the collective choice behaviour of the police and the public.
- In endogenous situations (wholly within the police institution), rational choice and bounded rational choice theories do not explain the observed results. The emerging behavioural theory of human interaction is more explicative in describing the behaviours of the police participants.
- In exogenous situations (between police and the public), rational choice and bounded rational choice theories do not explain the observed results. The emerging behavioural theory of human interaction is more explicative in describing the behaviours of police and nonpolice participants.
- Collective action and collective choice do explain the observed phenomenon of “shallow problem solving.”

The following sections will discuss the results of the various action situations within the context of their respective models. The discussion will then broaden to review the comprehensive framework, theory, model, and applied aspects of the study. The study limitations are followed by a recommendation for future study. The chapter ends with concluding remarks. The overarching model structure of the study is provided here for ease of reference.

B. Summary of IAD Framework, Theory and Models

The Institutional Analysis and Development (IAD) framework proved very useful for this research from both the macro institutional and microsituational levels. The institutional perspective of the framework and the focus on theory testing result in a research design that is generalisable to the majority of police organisations, be they urban, suburban, or rural or in the US, UK or Australia. The microsituational models developed are particularly helpful in defining the methodological components of the
study (see Table 10, Table 12, Table 14, and Table 15). They provide a high level of study transparency and replicability, addressing concerns raised about the lack of same in contemporary police research (Kennedy, 2015, pp. 13-14). This study also explored linked models and the dynamism of the real life applied setting. The linked models were very successful in representing the dynamism of the “real life” applied setting. Another aspect of the models that was particularly useful was their flexibility, specifically the ability to adapt to the ingress and egress of anonymous positions and, in particular, the wide variety of collective action and choice that took place in Model 2 with police and non police participants. In short, this study successfully used a framework that is new to police research, tested choice theory and found that new theoretical considerations are called for in police research, and provided a methodology that is easily adaptable to the majority of police organisations for replicability, development, and expansion.

With specific regard to use of the IAD framework, this study explored only the change in choice rules. The vast opportunity of inquiry into other rules then presents itself. Other exogenous factors such as material conditions or attributes of community also were unexplored. For example, do the differences in budgets, organisational structure, staffing, or resources amongst police departments in Australia, the US, or UK result in influence behaviour within action arenas? Or, do regional communities behave differently from urban ones? Another potential level of inquiry has to do with the use of the IAD framework for inquiry into organisations of interest to police, such as drugs or other organised crime.

C. Discussion of Models and Action Situations

Because all models were linked and designed to allow participants to “opt out” at any time, the possibility existed for no outcomes to be produced. Yet, these outcomes were consistently produced by participants. It is not clear why this was so, although the theoretical implications in Theoretical Discussion (p. 173) provide some insight. The following sections discuss aspects and outcomes of each model as it was implemented, providing a window as to what actually happened in the applied setting and a subsequent basis for the theoretical discussion.
1. **Model 1 and Action Situations 1.1 and 1.2.**

This model is endogenous in that all participants have positions in the police institution. The outcomes available for these action situations ranged from “do nothing” to organising in a sophisticated manner and selecting very challenging addresses. No incentives or sanctions were associated with the choice options. In Action Situation 1.1, both study subdistricts produced an organisational structure that was different from their existing one. One structure was a vertical structure and the other was a matrix organisational structure. Police participants maintained the structure throughout the study. In Action Situation 1.2, participants selected addresses with significantly higher call counts and severities than those addresses not selected or the South West District as a whole, with an effect size ranging from moderate to high. This suggests that the results would generalise to a larger population.

The action situations in this model were sequentially linked with each other as well as with Model 2. The description of the action situations included a synopsis of the social
dilemma, rule change, and action situation elements (Table 10 and Table 12). These linked action situations proved useful. The magnitude of the social dilemma was reduced by creating two smaller instead of one larger one. Next, the separate action situations allowed participants to make choices based on a more limited set of information which helped to expedite the production of outcomes. Since one of the specific objectives of these two action situations was to investigate whether police participants, within the policing institution, would be able to act and choose collectively, the creation of two action situations also provided two theoretical tests.

Some observed issues with the use of the model as designed include limited number of participants as well as the framing of the social dilemma. In all cases, only command staff were involved in the designing the informal organisation (Action Situation 1.1) and selection of the problem addresses (Action Situation 1.2). The capacity exists to include other positions and participants in these Action Situations and to explore the strengths of limitations of so doing. In addition, the framing of the social dilemma was somewhat ambiguous at the start, as indicated by participants. This issues of framing has been raised by others (Kahneman, 2011; Kahneman & Tversky, 1979; Kahneman & Tversky, 2000), but it may be that the ambiguity allowed for more flexibility and innovation since participants successfully produced outcomes in spite of it.


Model 2 is exogenous and involves the police and nonpolice participants. Thus, positions from the policing institution represent an element in the action situation. However, nonpolice participants at the inception of the action situation do not hold positions within any formal institution but, rather, the informal one of “community.” The outcomes available for these all 31 action situations ranged from an increase in calls and severity to a decrease in numbers and severity. To recapitulate the methodology for these action situations, no incentive or sanction existed for the participants. In particular for residents, there was no legal sanction for continuing to have high levels of calls attributed to their address. For the police participants, this was a secondary responsibility and one not formally performance evaluated.
The results show a clear reduction in both calls and severity of calls when compared to the unselected group and the South West District. The reduction was significant. The effect sizes were moderate to high.

The description of the action situations included a synopsis of the social dilemma, rule change, and action situation elements (Table 14). The aggregation of these action situations into one model proved useful from several perspectives. First, it recognised that while there were many action situations, at the institutional level there were common action-outcome linkages as well as a common constitutional choice that activated (and concluded) the action situation group or action arena. Thus, a whole range of diverse actions and choices were undertaken in a way that is replicable and also aligned with the IAD framework. In addition, this aggregation or model, allowed for linkages between other action situations, e.g. Model 1 and Model 3, to be more easily represented.

Next, this aggregation of action situations provided information that allowed for the theoretical inquiry in a more robust way, in that the results of one action situation would not be persuasive. However, a group of action situations, and their associated collective choice activities using the same structure, essentially yielded 31 separate theoretical tests.

The linkage between the Model 1 action situations and those of Model 2 also worked well. During the course of the study, no disconnects were observed. That observation is supported by the fact that the outcomes of Model 1 (AS 1.1 organisational structure and AS 1.2 original list of target addresses) did not change throughout the study.

From a practical perspective, 18 police participants and 42 nonpolice were documented as participating in this action situation, a substantial leveraging effect from the perspective of the police organisation. In addition, the participation of officers was from discretionary time. While there was substantial discussion early on by police participants about the availability of discretionary time, the results demonstrated that sufficient discretionary time existed to achieve the observed outcomes of decreased calls for service.
3. Model 3 and Action Situation 3.X.

Model 3 was designed to provide for a collective reiteration of Models 1 and 2 which are linked. However because of the four month length of the study, no more than one iteration of Model 3 was expected, which was the case. The Debriefing Summary (p. 166) provided information which indicated that the potential existed for a fuller exercising of Model 3 in a longer study, including feedback and learning. For example, Busselton police participants observed that changes in the organisational structure they created might provide better outcomes. In another example, outcomes were produced for all the action situations in Model 2, leaving the capacity for the police participants in Action Situation 1.2 to select new problems towards the end of the study timeframe and to continue with Action Situation 2.X. This did not happen, and the Action-Outcome Linkage of Model 3 as described in Action Situation 3.X (Table 15) explains why. The Action-Outcome Linkage specifies that “permission of the Assistant Commissioner” is required in order to animate the Action Situations 3.X. At this writing, a new Assistant Commissioner has been appointed and is being briefed about the study.

D. Theoretical Discussion

The results across all models are not explained by classical choice theory. Issues such as trust, reciprocity, heuristics, and learning were observed and raised by participants themselves throughout the study. These dimensions are not catered for by classical choice theory. The emerging general behavioural theory of human action is more explicative. Figure 40 portrays a more accurate representation of the dynamics observed during the study.

Figure 40. Effect on Cooperation of Microsituational and Broader Contexts (Poteete et al., 2010, p. 227)
Each model provided a different opportunity for collective action and choice, with the potential for different outcomes and theoretical interpretations. Thus, the theoretical implications of each model’s results are discussed individually.

1. **Theoretical implications of Model 1 results.**

The conditions of both Action Situations, and 1.1 in particular, are very well defined. Also because they occur wholly within the police institution, these action situations incidentally test the robustness of the policing institution with regards to its ability to accommodate collective action and collective choice, versus its characteristic command and control structure. Researchers have attributed to the police institution a cultural intransigence to change (D. Allen & Karanasios, 2011, p. 88; Ashby et al., 2007; Darroch & Mazerolle, 2013, p. 6). Conversely, Lum et al. (2012) have identified a police openness to using and conducting empirical research, in theory, but a practical negativity about a particular contemporary police approach being implemented in their jurisdiction, i.e. hot spots policing. *Robustness of the policing institution (p. 85)* provides additional information about this topic.

In short, the policing institution is characteristically robust with a strong internal command and control structure as related to its primary reactive call taking responsibilities. Also, there is no particular benefit that accrues to officers for participating, say, in this study.

The dimensions of rational choice and bounded rational choice theories are described more fully in *Theoretical implications of Model 2 results (p. 179)*. Application of both classical rational choice and bounded rational choice theories would argue that:

- Since police participants received neither benefits nor sanctions for participating, that they would assess the utility and beneficiliality of both action situations as being very low at the outset.
- That any perceived (not real) benefits or sanctions that motivated a choice to be involved initially would revert to a choice not to be involved as continuous cost-benefit calculations were made by the participants
- On the basis of stable preference, the expected choice would be one of not participating
In short, both theories predict that police participants would not produce an outcome on either action situation. Or, if an outcome was produced, it would be minimalist in scope.

This was not the case. Where police participants could have selected their existing organisation in Action Situation 1.1, they developed two different secondary organisations that resulted in additional work for them. Participants also assigned themselves levels of responsibility that were high and could have been avoided. The design of the Collie Geobeats is particularly interesting because of the level of cooperation, trust, and reciprocity that was designed into it by the participants.

In Action Situation 1.2, participants selected addresses that were far more challenging with a disproportionately high level of violent crime calls and number of calls. Rational choice and bounded rational choice would predict no participation or, if participation occurred, the selection of a small number of problems each of which had a low number of calls with low severities. In other words, simple ones.

2. Theoretical implications of Model 2 results.

From a rational choice perspective and using key concepts provided by Martinelli (2010) and described in *Rational choice and bounded rational choice theory* (p. 72), the results are not explained by rational choice theory. Both classical rational choice and bounded rational choice assume utility and profit optimisation. The concept of (utilitarian-economic) rationality also indicates that individuals will consistently, and continually, undertake cost-benefit calculations as a means of optimising their outcome. They will also chose stable preferences, that is, the ‘status quo.’ Their actions will be individually focused and, in fact, societal-level phenomena are assessed through the individual, not collectivities (Martinelli, 2010, pp. 251 - 253).

Application of the classical rational choice theory would argue that:

- Since police participants received neither benefits nor sanctions for participating, that they would assess the utility and beneficiality of the action situation as being very low at the outset.

- As the project proceeded and confirmed that neither benefits nor sanctions were involved, that any perceived (not real) benefits or sanctions that
motivated a choice to be involved initially would revert to a choice to not be involved.

- On the basis of stable preference, the expected choice would be one of not participating
- If the initial choice was to participate and engage with residents in a new way and without legal recourse to require a change in resident behaviour, that the continuous cost-benefit calculation would over time results in a choice not to participate
- If the initial choice was to participate and on the basis of stable preferences, police officers would not pursue collective choice with residents, particularly given the police officers’ primary responsibility was authority based

Based on these individual choices, no reduction in calls or call severity would be expected.

Bounded rational choice theory “rejects the premise of optimization in terms of ‘satisficing’, but retains utility and profits as objective functions and ends” (Martinelli, 2010, p. 250). Qualitatively different with bounded rational choice theory is some element of the unknown in that the individual does not have complete knowledge. In this study there were no direct benefits or sanctions. However, there may have been perceived benefits or sanctions, particularly at the outset. Over the course of the study, though, the clarity with regards to this would have improved. In short, the conclusion of no reductions in calls or call severity being achieved would again result.

From the perspective of nonpolice participants, the same concepts of utility and profit optimisation apply. The argument can be made that it would be even less likely for nonpolice to choose to participate since (1) no legal requirement existed to do so and (2) the police institution was external to them.

Nonetheless, participate everyone did. And from the results and information provided by the study, many choices were made collectively that did not maximize individual utility or profit, from a formal language point of view. From an informal language point of view, individuals found time to participate in an action situation over multiple
iterations, engaged in collective and constitutional choice, found anonymous participants to join them in that “social space where participants with diverse preferences interact, exchange goods and services, solve problems, dominate one another, or fight” (E. Ostrom, 2005, p. 14), and achieved a significant result that effectively did not directly benefit them individually.

3. Theoretical implications of Model 3 results.

While Model 3 was not fully exercised, its limited use can provide insight into theory. First, the action-outcome linkage presents a constitutional choice situation. If the constitutional choice is made in the affirmative, the subsequent collective action scenarios are permitted to proceed. If that constitutional choice is made in the negative, the subsequent collective action scenarios are not permitted to proceed. However, if no choice is made a social dilemma presents itself. Should the subdistricts continue in the absence of the rule change that provides them with that permission?

The prediction of all three theories would be, no. Rational choice and bounded rational choice would indicate a preference for the “status quo” as well as the choice not to participate because of individual benefit. The emerging behavioural theory of human interaction would predict that with no change in rules, as provided by the action-outcome constitutional choice linkage, the action situations would not be animated.

Thus, while the outcome explanation of the three theories is the same, The IAD framework allows for modelling that reflects the dynamism of Model 3. If the constitutional choice is made, the rule is changed, and Models 1, 2, and 3 are animated. Rational choice and bounded rational choice are less able to account for this dynamism and hierarchy of analytical decision making (see Figure 9).

E. Problem Solving Discussion

As discussed in Problem Solving (p. 49), “shallow problem solving” (Weisburd & Braga, 2006, p. 145) refers loosely to the non-use of the SARA Model (Eck et al., 1987). This study expanded that definition to include the non-use of any problem solving model. In other words, participants were unfettered as to their problem solving approach. As it appears in the literature, the use of the word “shallow” indicates a less than optimal use of a proscribed problem solving model. The inference from the
critique in the literature is that without a proscribed problem solving model, positive outcomes would not be expected from police undertaking problem solving activities. This view is refined to express that ad hoc problem solving might be successful on simple problems but that a model would be required for more complex ones (Braga & Weisburd, 2006). The problem with the preceding is that even with “shallow” problem solving, positive outcomes have been observed in terms of call for service reduction (Braga & Weisburd, 2010).

This study specifically replaced the traditional policing problem solving model with Action Situations 2.1 – 2.X. These action situations were used to explore whether the problem solving observed by police researchers was not actually “shallow” but, rather, more complex and that collective action and collective choice more aptly described the phenomenon being observed.

The results support that collective action and collective choice explain the phenomenon of “shallow problem solving.” Aside from the reduction in call counts, which could be achieved from simple problems, a significant reduction in violent crime calls was observed as was a moderate effect size, arguing this result would apply to larger populations. This directly contradicts the assertions of Braga and Weisburd (2006) and brings into question the assumption that the police need to be rigorously guided in their problem solving endeavours.

Thus, neither the SARA Model nor any problem solving model was needed to achieve the results, which is a significant departure from the presumed methods of many of the contemporary police approaches. The participants brought heuristics, norms, and strategies to the action situation that were sufficient, through the iterations of the action situation, to achieve positive outcomes.

These results argue that like rational choice theories, problem solving models such as SARA may no longer be sufficient to explain observed results. Figure 40 describes another theoretical perspective. In it, participants are fallible learners who bring a range of heuristics, norms, and experiences to a social dilemma and reflect behaviours that have been observed in rigorous experimental research (E. Ostrom, 2005, Chapter 3). As opposed to empty vessels needing to be filled with problem solving knowledge (Eck, 2006), participants bring experiences and skills to the problem solving table. In
addition when they interact with one another and make collective choices, they engage in behaviours that are aptly described by the emerging general behavioural theory of human action.

The results of this study indicate that unfettered by a prescriptive problem solving model, police and non police participants are successful in achieving significant reductions in calls for service, and in violent crime calls as well. The question for future study then becomes how these reductions can be continued and sustained as discussed in *Directions for Future Study* (p. 192).

F. Implications of Main Findings

1. IAD framework and institutional perspective.

What do irrigation farmers in Nepal have in common with police officers in this study? More than you might think. In a recent article, E. Ostrom (2014c) describes exactly the type of collective action observed in this study but through the lens of another institution, farmer-managed irrigation systems in Nepal. Her article provides a general method of institutional analysis that is reflected in this study. There are a number of similarities including observed behaviours and theoretical implications in both studies. In short, the method, results, and theoretical implications of this study are relatively consistent with those observed in recent common pool studies.

Thus with regards to the research question asked in this study as to the relevance of the IAD framework, the main implication is in the affirmative. That is, as a “general language for analysing and testing hypotheses about behaviour in diverse situations at multiple levels of analysis” (E. Ostrom, 2010a, p. 261), the IAD framework can be used successfully to explore and understand the police institution.

Since the IAD framework can be used successfully, the next question is are there benefits to it as a framework? The current framework options mooted in police research are scientific paradigms, both physical and natural. Epistemically, physical and natural science have major limitations with regards to social science research. Their philosophical foundations are based on knowledge derived from observation in the physical and natural worlds, not the social world. Social epistemology is philosophically founded on the social dimensions of knowledge and all that implies.
The current methodological debate in police research with regards to the use of random control trials is, actually, a larger epistemological debate that has not happened.

The endogenous and exogenous aspects of this study explored not only whether the IAD framework could be used for theoretical inquiry wholly within the police institution but, also, whether it could be used for theoretical inquiry between the police and the public. The results of this study are confirmatory in both regards. The implications are that the IAD framework can be shaped to inquire about how the police behave within the police institution, how the police and public behave in situations where they are both participants, and how specific subsets of the police and nonpolice can be analysed and tested, including situations that are defined by characteristics of place or characteristics of persons (or both).

The IAD framework has been developed as a tool for the social sciences. The results of this study indicate that it has utility but needs to be used more extensively to identify the benefits and limitations of its application to police research. However, because of the framework and, in particular, the models developed, this study is highly replicable and can aid in that regard.

2. Theoretical implications.

The first theoretical implication of this study is that choice theory can be used to describe the behaviours of police and nonpolice. When much of police research undertakes theoretical inquiry into behaviours, that theoretical inquiry is usually restricted to “criminal” or “offender” behaviour. The implication of much police related research and theory inquiry is that offenders and criminals are somehow different from the rest of us. And they may be. But several facts argue against this.

In his discussion of intelligence-led policing J. Ratcliffe (2011, Chapter 3) provides supporting information in two ways: the “crime funnel” and the “offender problem.” The crime funnel refers to the fact that for “every 1,000 crimes, less than 8 per cent are detected” (J. Ratcliffe, 2011, p. 52). Additionally is the fact that of that 8 percent only 1 percent result in a custodial sentence. The offender problem describes the fact that many people commit a crime at some point in their lives.
For example, the Youth Lifestyles Survey, a survey of self-reported offending by 4,848 people between the ages 12 and 30, found that 57 per cent of males and 37 per cent of females had committed an offence at some point in their life, and that nearly 20 per cent of the had done so in the previous 12 months (Flood-Page, Campbell, Harrington, & Miller, 2000). Eighteen per cent of the crimes they committed were violent offenses, and 55 per cent property crimes (J. Ratcliffe, 2011, p. 53).

Bliesner (2012, p. 53) tells us that norm-violating behaviour is, well, the norm for youth and that “the majority of young respondents commit some petty (though still criminally relevant) transgressions such as cheating at some time during adolescence.” The conclusion is that the majority of people have committed a crime at some time in their life but, at the same time, the majority have not been caught.

The other issue with the offender focus of much policing research is that in order to identify an offender, that individual needs to offend and be caught doing so. Thus, the pool of individuals upon which much criminological theory is based can, at best, be described as that small number who, for whatever reason, have been identified as “offender” or “criminal.” This is problematic from the perspective of sample normality as well as theoretical inquiry.

In the first instance, theory in police research focuses on a small subset of individuals whose choice behaviours are assumed to be different from the rest of us, as in Kennedy (2009) and his discussion of subjective rationality. The proposition is that in some way the small number of people who are caught use a different approach to rational choice. This differentiation of offenders and criminals has resulted in creation of derivative rational choice theories such as deterrence theory. However, these derivative theories are no more successful at describing offender choice than classical rational choice is when applied to the rest of us. In short, rational choice and bounded rational choice theory just do not stand up to scrutiny when compared with observed results. The implication is, then, that other theories are needed and the emerging behavioural theory of human action is certainly one to be considered.

The second theoretical implication of this study is that if rational choice theories do not explain the behaviours of police and nonpolice, and the emerging behavioural theory of
human action is more explicative, then the discussions about the police (and their interactions with the public, including offenders and criminals), might need to be reoriented. The reframing would arguably be in terms of collective action and collective choice as well as the other levels of analysis as provided by the IAD framework. For example, the policing literature is quite sparse in terms of its description of police and public partnerships, although the topic of police legitimacy is relevant. This study provides a framework for inquiry as well as an emerging theory to explore in understanding how to analyse and develop those unexplored partnerships.

3. **Implications for policing research.**

Last, and with important implications for police research, is the institutional implication of the use of the IAD framework. The experienced police researcher will have identified, in this study and with the exception of pulling levers policing, that all the contemporary police approaches in Table 1. *Summary of Contemporary Approaches* have made an appearance. The following lists each approach, its referenced definition from Table 1, and a synopsis of how this study is representative of that approach.

- **Broken Windows Policing.** The majority of call types were non criminal (75%) and characteristic of the types of disorder calls that broken windows indicates need to be reduced to also reduce crime. Violent crime calls reduced statistically although no causal linkage was identified between the two call types (Sousa & Kelling, 2006, p. 78).

- **Community oriented policing.** The problem solving was undertaken collectively with the community, in the first instance residents at the target addresses and later often with others (Weisburd et al., 2012, p. 1).

- **Compstat.** The Geobeat structure reflects command accountability, mapping, and analysis of calls albeit the study did not restrict itself only to crime but also included low level infringement and noncriminal calls (Bratton & Malinowski, 2008, p. 259).

- **Evidence-based Policing.** The study adopted the original evidence-based policing concept, not the random control trial derivative, and used research to guide its design, albeit multidisciplinary research in the broader social sciences as well as police research (Sherman, 2002, p. 226).
• Hot Spots Policing. Very small geographic units, i.e. addresses, were targeted in the study (Braga & Weisburd, 2010, p. 9).

• Intelligence-Led Policing. Data analysis was used objectively to facilitate crime and problem reduction (J. Ratcliffe, 2011, p. 6).

• Problem-Oriented Policing. The end product of policing was considered and incorporated into the study, including specifically collective action, collective choice, and problem solving (Goldstein, 1990, p. 3).

• SMART Policing. Data, analysis, and evaluation were used. Efficiency was improved and innovation encouraged (Coldren et al., 2013, p. 275).

• Third Party Policing. Police successfully persuaded nonoffending persons to take actions. These nonoffenders included residents, neighbours, governmental representatives, landlords, and others (Buerger & Mazerolle, 1998, p. 301).

How can one small study reflect all these approaches? One observation could be that the approaches themselves are not well defined and, as such, overlap significantly. While there is an element of this, the reality is that there is a high level of integrity with each approach. Each strives within a particular arena to describe a very specific set of activities and objectives within policing, with a significant amount of contributory research related to each.

An alternative observation is that these approaches are fragmented and tactical in nature. That is, they are not framed from the context of the institution. This is a possible result from the use of a scientific epistemology and positivist approach, which characterises much of police research, where the phenomenon (or symptom) is identified and then inquiry proceeds in relationship to it. Thus, that which is studied proceeds not necessarily with reference to the holistic paradigm or, as this study describes, the institution.

The IAD framework identifies the institution in the first instance and then provides for theoretical inquiry into the institution, albeit in smaller, model contexts. However, those models are created to ask theoretical questions for the purpose of analysing and developing the institution. Thus, it is not surprising that a small study that uses the IAD
framework from an institutional perspective crosses many preconceived boundaries of what police research is currently about.

There is much to be said about the contemporary police approaches and the need for taking an institutional view, but this study is not the place for that discussion. The sense is, however, that much of the value of police research is being lost in the proprietary debate about whose approach is best. Better that we figure out how these approaches fit within the larger institutional framework, and identify their strengths, complementarities, and gaps.

4. **Applied implications.**

Four categories of applied implications have resulted from this study

- Table 9. Practical Research Design Considerations (p. 101)
- Use of call for service data
- Collective action and collective choice as problem solving
- Cost and efficiencies

**a. Applied research design considerations.**

Table 9 quantified applied research design specifications that were integral to the research design for this study and that were intended to reflect the practitioner perspective. Some particularly beneficial aspects included: liaising with the police agency in advance to identify a topic for field study that was relevant to the operating needs of WA Police; ensuring consistency with the subdistricts’ existing structure, personnel assignments, and operations; and no additional budget being required. The research design complied with all the specifications, none of which were modified during the course of the study. The ease with which the study progressed is one positive indicator of the positive results from using these design specifications.

**b. Call for service data use.**

As discussed in Data Collection and Reports (p. 122), this study used call for service data which has its strengths and limitations. An additional strength identified in this study has to do with closing the data feedback loop and the opportunity for continuous
improvement. For most police officers in this study, as well as the nonpolice with whom they shared the call data, this was the first opportunity for them to see the call data used in a comprehensive, relevant way. Because officers were provided with the complete list of calls for the previous three months, the call data was completely transparent. Police participants had the opportunity to critique what they had been given but, also, to understand that the call data, including that which they had self-initiated, was useful. Also, the quality of the data proved to be quite good, with less than 2% error in the raw data set. Other aspects of the call data that were positive aside from its utility was that it was easy to obtain and easy to understand. Also, officers could discern patterns using just the raw call data or confirm (or not) patterns that they had already intuitively identified. Finally, WA Police as a whole uses calls for service to quantify service demand. Thus, using calls for service was consistent with WA Police’s demand reduction strategy. It is also important to note that call for service data has its own inadequacies since call data is designed for a different purpose.

c. **Collective action and collective choice as opposed to problem solving model.**

The topic is initially discussed in *Problem Solving* (p. 49). This section specifically addresses the issue of police research assumptions that the SARA model (Eck et al., 1987) is inextricably interwoven with problem solving research and, in some instances, a mandatory requirement. This study demonstrates that the SARA model is not mandatory to achieve significant outcomes and supports Tilley and Scott (2012) in their observation that a broader theoretical mix is called for when considering police problem solving. The results also bring into question some of the problem-solving assessments completed using the SARA model as a requirement. The Weisburd et al. (2008) Campbell Systematic Review of problem-oriented policing identified only 10 studies of 5,500 originally identified using the SARA model or a SARA-like process as one of the inclusion criteria. Because the study drew conclusion about the use of problem solving generically in policing, it has drawn criticism for its limited interpretation of problem solving and its overall contribution to operational policing (Sparrow, 2011, p.14). The results of this study suggest that a rich and well developed framework and ontology exists that instead of being a “model” is, rather, means of theoretical development around the issue of how the police can solve problems, and how they problem solve collectively with the public, as well.
This study suggests that police and nonpolice bring heuristics, norms, strategies, and rules to collective action and collective choice. They can be successful at what would be defined as problem solving without using a mandatory, proscribed process, particularly a proscribed process that does not have its core the theoretical inclusion of heuristics, norms, strategies, and rules. That being said, there may be parts of police work that require a more proscriptive, narrow approach, for example reactive call taking. Thus, the opportunity exists to investigate not only “how” but “where” and “when” collective action and choice is appropriate.

\textit{d. Cost and efficiency.}

This study required no financial support. Officers found time within their normal working day to participate. While there were different views as to how difficult this was as described in \textit{Debriefing Summary (p. 164)}, the clear outcome was that significant reductions in calls and severities were achieved using existing police resources. Nonpolice time was also contributed by those from other governmental agencies, as part of their normal duties, as well as other participants, none of whom were compensated for their involvement.

Thus, resources were available to undertake the work and, over time as repeat calls were reduced, the expectation would be for continued resource recovery to continue with a long term prognosis of no cost.

\textbf{G. Limitations of the Study}

\textbf{1. Limitations of the design.}

The design limitations of the study include: sole study, length of study, small number of participants, and small number of problem addresses.

As a sole study, the results, while encouraging, are exposed to sampling error. The study sites were selected by convenience, not randomly. While the analysis of results was designed to observe and control for sampling errors, the effect size in some instances was moderate and might not generalise to a larger population.
The four month study length, and the fact that police calls are seasonal, introduces a potential sampling error. In addition, the short time frame also introduced potential errors in that the participants were provided with information, permissions, and the opportunity to behave in situations, all of which were new to them. The potential exists for the results observed to be both understated, because participants may become more proficient over time through feedback and learning. Or, conversely, the result may be overstated because the “newness” of the arrangements was attractive in a way that might not be sustained over time.

The number of participants, particularly for Action Situations 1.1. and 1.2, was very small. While these represented the full complement of those identified participants for that particular action situation, their small number would argue for an introduced sampling error. This sampling error has the potential to be amplified because of the non-random site selection.

The number of addresses selected for collective action was very small and not representative, with disproportionately high violent crime and non criminal call types. Criminal and non criminal infringement calls were so under-represented as to be trivial. Thus while the results were significant, they are from skewed data.

The study needs to be replicated with these limitations addressed. First, replication at other police agencies or, at a minimum, different subdistricts within the Western Australia Police would help test the robustness of the findings. Ideally, the site selection in that replication could be achieved through a more unbiased selection process than convenience. The participant pool needs to be expanded, with an eye to different types of service areas: rural, suburban, and metropolitan. That replication needs to be for twelve months to address the seasonality of calls for service. Study replication over a longer time period with a larger number of participants should also result in a more representative number of call types in the pool of addresses.

2. **Limitations of the theoretical considerations.**

The primary theoretical limitations of the study are that only rational choice, bounded rational choice, their policing derivatives, and the emerging general behavioural theory of human action were considered. The study supports that rational choice, bounded
rational choice, and by implication, the policing derivatives of these theories are suboptimal in describing the behaviours observed. However, the small sample sizes and duration of the study raise questions about the generality of that result. In addition, there are other theories that might contribute to understanding the observed behaviours, for example theories that deal with risk.

Risk was not considered, either at the structural or cognitive level, in framing the decision problems in this study. Retrospectively, a risk and uncertainty component should have been considered in the study design. The IAD framework addresses certainty, risk, and uncertainty through action – outcome linkage patterns that are structural aspects of a situation (E. Ostrom, 2005, p. 49). For example, using rational choice theory, a particular action will lead to a specific outcome with a high level of certainty and low level of risk. Viewing these same situations and actions through the lens of the emerging general theory of behavioural action there is less certainty; there is more risk; and, there are a number of possible outcomes. The latter characterises the results of the action situations in this study.

There are also cognitive aspects of risk. Police participants expressed a certain level of concern during all the action situations, in part, because they either did not have information or they were not persuaded the information provided was accurate. For example, a healthy level of scepticism attended the permission to organise, select addresses, and engage with nonpolice to reduce calls. Alternatively while the perceived risk of nonpolice participants was not assessed, one could argue that a police officer arriving at a residence without a preceding call for service might have a cognitive risk component for the residents at that address. From a structural aspect, the certainty, risk, and uncertainty of the action-outcome linkages need to be specifically considered in future replications. In addition to risk associated with the structural aspects of the situation, cognitive risks and cognitive risk theories might have a contribution to make.

H. Directions for Future Study

This study supports the use of Institutional Analysis and Development (IAD) framework in other social science disciplines. In this particular case, the police institution was studied in a very small and limited way. Replications and expansions of this study are indicated to explore the robustness of the results. In addition, the
theoretical implications of this study provide a rich opportunity for future study particularly with regards to contributing to the emerging general behavioural theory of human action. The question arises as to whether a uniform theory of behaviour exists that describes the choices of police and nonpolice, including offenders and criminals. Other multidisciplinary theories may also have a contribution to make, including those theories that deal with risk and the framing of problem statements.

Another direction for future study is the exploration of collective action and collective choice, both endogenously and exogenously. Are there limits to the extent to which collective action and collective choice are consistent with the policing institution because of its robustness? If so, what are those limits? Are collective action and choice useful to model situations where police and nonpolice are participants? How do trust, reciprocity, norms, rules, and strategies work within the endogenous and exogenous contexts and how might the answers to these questions improve the public service of policing? A particular question for future study has to do with face-to-face communication and its role in explaining the results of this study.

Discussed only briefly in Introduction to Institutional Analysis and Development (p. 51) was polycentricity. This concept refers to the existence of institutions not as isolates but as interconnected entities. The criminal justice system is a particular example of polycentricity with its overlaps and interdependencies amongst law enforcement, prosecution, judiciary, and corrections. While this study focused on the policing institution, it is important not to study the police institution in isolation to ensure unintended consequences from a polycentric view. From a microsituational level, some problems lend themselves to the involvement of third parties whose positions are in institutions outside of policing, including institutions not part of the criminal justice system. Thus, an area of future study that encompasses to some degree third party policing, is understanding this polycentricity. This study also goes to the core of what public service do the police provide and, by implication, what work is the responsibility of others institutions.

Some specific areas of future study related to replication and expansion of this study include the following:
• Framing of initial social dilemma. Is it beneficial to provide a more rigorous framing of the social dilemma, which was not done in this study, or is a level of ambiguity advantageous in fostering innovation and participation?

• Consideration of risk. Is risk an operative factor in determining whether participants, either police or non-police, will opt in or opt out of collective action and collective choice? What risk factors need to be mediated to optimize participant?

• Longevity and sustainability. The results of this study were obtained over a short time period. Can these results be sustained and increased over time or will factors related to familiarity, reciprocity, and trust result in diminishing returns?

• Results in different localities. While the design of this study argues for replicability in the US, UK, and Australia as well as in urban, suburban, and rural jurisdictions, that assertion needs to be tested.

On important set of important future research opportunities involves expanding inquiry using the IAD framework. For example, this study uses a change in choice rule. Other rules are available to be explored. How do other exogenous variables (Figure 6) such as attributes of the community or biophysical/material conditions affect the outcomes? Also of interests are exploration of some of the dimensions that are of particular interest to police. For example, does collective action with participants who are offenders, mentally ill, young, or old provide a different result?

A final opportunity involves testing observed results from other police research studies against the emerging general behavioural theory of human interaction as well as recasting problem solving study results against collective action and collective choice. This reassessment may provide the segue to a more rich, complex, yet messy, understanding of policing and provide a guide for future research that is more multidisciplinary and methodologically pluralistic.
I. Conclusion

Policing is currently at a crossroads from both the research and practitioner perspectives. Researchers are debating fundamental epistemic, ontological, and methodological questions as to what constitutes best practices policing research. Practitioners are raising issues about the relevance and utility of the research produced. Both parties have recognised the need for closer partnerships. However, significant governmental funding reductions being experienced in academia and policing has made progressing this collaborative agenda challenging. Early indications are that the need for applied research relevance has been embraced by key researchers and that a more pluralistic methodological approach is gaining acceptance. However, the fundamental epistemic questions are yet to be answered with regards to how knowledge is acquired about policing, with the subsequent ontological questions about paradigm and theory testing remaining unclear in the discipline.

The main objective of this study was to explore a multidisciplinary approach that raised and, in a small way, answered some of these fundamental policing research questions. Using the Institutional Analysis and Development framework, this study demonstrated that the police amongst themselves and when presented with a social dilemma, do engage in collective action and collective choice regardless of the robustness of the policing institution. More important, the police together with nonpolice also engage in collective action and collective choice. These findings coupled with the use of the IAD framework open a rich opportunity for extending police research beyond its current fragmented condition, providing an impetus to view policing from a holistic institutional viewpoint.

In addition, this study tested the classical policing theory of rational choice and bounded rational choice and determined these theories did not explain the study results. The emerging general behavioural theory of human action did explain the results. Given this theory has not been considered in the policing literature, this study opens a door into a different way of explaining the behaviour of the police and public, including the behaviour of both nonoffenders and offenders. The collective action and collective choice dynamics, as well as the trust, reciprocity, heuristics, and learning that
characterise these dynamics, provide an opportunity to capitalise on research in other social science disciplines that has considered the rich fabric of human behaviour.

Lastly, this study also reframed the question as to what police problem solving approach is required to a question of: will participants through collective action and collective choice be able to achieve results that had previously been attributed to a proscribed problem solving approach? The study determined that the participants were very successful in achieving both significant reductions in calls for service and call severity through their collective activities and choices. In addition to providing a way forward for practitioners interested in demand reduction, this finding opens the arena for a recognition of the value of what participants naturally bring to problem solving and also raises the question of how much external guidance is needed in these endeavours.

The limitations of the study are that it involved a small number of participants and was of a short duration. Thus, replication and expansion of the study is called for before the results are generalised. That being said, the Institutional Analysis and Development framework was clearly a useful tool and provided an ontology, methodological support, and level of replicability that has value for future policing research.
Appendix A. South West District Summary Report Sample
### MONTHLY REPEAT CALL FOR SERVICE REPORT (June 2014)

#### SWD ROLLING QUARTERLY REPEAT CALLS

<table>
<thead>
<tr>
<th></th>
<th>CALLS</th>
<th>REPEAT CALLS (2+)</th>
<th>% REPEAT</th>
<th>REPEAT CALLS (5+)</th>
<th>% REPEAT</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOUTH WEST DISTRICT</td>
<td>7,840</td>
<td>4,209</td>
<td>53.7%</td>
<td>1,456</td>
<td>18.6%</td>
</tr>
<tr>
<td>COMMAND A</td>
<td>1,827</td>
<td>853</td>
<td>46.7%</td>
<td>277</td>
<td>15.2%</td>
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<tr>
<td>COMMAND B</td>
<td>6,013</td>
<td>3,356</td>
<td>55.8%</td>
<td>1,179</td>
<td>19.6%</td>
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<tr>
<td>SUBDISTRICT A</td>
<td>36</td>
<td>6</td>
<td>16.7%</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>SUBDISTRICT B</td>
<td>918</td>
<td>400</td>
<td>53.4%</td>
<td>126</td>
<td>13.7%</td>
</tr>
<tr>
<td>SUBDISTRICT C</td>
<td>29</td>
<td>7</td>
<td>24.1%</td>
<td>0</td>
<td>0.0%</td>
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<tr>
<td>SUBDISTRICT D</td>
<td>122</td>
<td>55</td>
<td>45.1%</td>
<td>11</td>
<td>9.0%</td>
</tr>
<tr>
<td>SUBDISTRICT E</td>
<td>3,355</td>
<td>2046</td>
<td>61.0%</td>
<td>782</td>
<td>23.3%</td>
</tr>
<tr>
<td>SUBDISTRICT F</td>
<td>1,099</td>
<td>575</td>
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<td>223</td>
<td>20.3%</td>
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<tr>
<td>SUBDISTRICT G</td>
<td>543</td>
<td>231</td>
<td>42.5%</td>
<td>46</td>
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<tr>
<td>SUBDISTRICT H</td>
<td>127</td>
<td>36</td>
<td>28.3%</td>
<td>11</td>
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</tr>
<tr>
<td>SUBDISTRICT I</td>
<td>253</td>
<td>96</td>
<td>37.9%</td>
<td>20</td>
<td>7.9%</td>
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<tr>
<td>SUBDISTRICT J</td>
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<td>19.4%</td>
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<tr>
<td>SUBDISTRICT K</td>
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<td>46</td>
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<tr>
<td>SUBDISTRICT L</td>
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<td>143</td>
<td>40.6%</td>
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<tr>
<td>SUBDISTRICT M</td>
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<td>14.8%</td>
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<tr>
<td>SUBDISTRICT N</td>
<td>54</td>
<td>11</td>
<td>20.4%</td>
<td>5</td>
<td>9.3%</td>
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<tr>
<td>SUBDISTRICT O</td>
<td>324</td>
<td>197</td>
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<tr>
<td>SUBDISTRICT P</td>
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<td>0</td>
<td>0.0%</td>
<td>0</td>
<td>0.0%</td>
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<tr>
<td>SUBDISTRICT Q</td>
<td>94</td>
<td>53</td>
<td>56.4%</td>
<td>26</td>
<td>29.6%</td>
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Appendix B. Typology
<table>
<thead>
<tr>
<th>CALL TYPE DESCRIPTION LIST</th>
<th>TYPE</th>
<th>VALUE</th>
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<tbody>
<tr>
<td>Abandoned Stolen Vehicle</td>
<td>NC</td>
<td>3</td>
</tr>
<tr>
<td>Abandoned Vehicle</td>
<td>NC</td>
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</tr>
<tr>
<td>Abduction/ Dep of Liberty</td>
<td>VC</td>
<td>4</td>
</tr>
<tr>
<td>Airport Emergency</td>
<td>NC</td>
<td>1</td>
</tr>
<tr>
<td>Alarm - Residential</td>
<td>NC</td>
<td>1</td>
</tr>
<tr>
<td>Alarm – Business</td>
<td>NC</td>
<td>1</td>
</tr>
<tr>
<td>Alarm – Duress</td>
<td>NC</td>
<td>1</td>
</tr>
<tr>
<td>Animal Complaint</td>
<td>NC</td>
<td>1</td>
</tr>
<tr>
<td>Armed Hold-up</td>
<td>VC</td>
<td>4</td>
</tr>
<tr>
<td>Assault</td>
<td>VC</td>
<td>4</td>
</tr>
<tr>
<td>Assist Motorist</td>
<td>NC</td>
<td>1</td>
</tr>
<tr>
<td>Assist outside agency</td>
<td>NC</td>
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<tr>
<td>Burglary</td>
<td>C</td>
<td>3</td>
</tr>
<tr>
<td>Children’s Crossing Guard</td>
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<td>1</td>
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<tr>
<td>Collapsed Person</td>
<td>NC</td>
<td>1</td>
</tr>
<tr>
<td>Crash</td>
<td>NC</td>
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</tr>
<tr>
<td>Critical Incident</td>
<td>NC</td>
<td>1</td>
</tr>
<tr>
<td>Damage</td>
<td>NC</td>
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</tr>
<tr>
<td>DCS Exclusion Zone Violation/Threat to v</td>
<td>VC</td>
<td>4</td>
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<tr>
<td>Disturbance</td>
<td>NC</td>
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<tr>
<td>Dive Request</td>
<td>NC</td>
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<tr>
<td>Domestic</td>
<td>VC</td>
<td>4</td>
</tr>
<tr>
<td>Domestic Violence Breach</td>
<td>VC</td>
<td>4</td>
</tr>
<tr>
<td>DUI</td>
<td>VC</td>
<td>4</td>
</tr>
<tr>
<td>EPIRB</td>
<td>NC</td>
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<tr>
<td>Escort</td>
<td>NC</td>
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</tr>
<tr>
<td>Explosive/Hazardous Device</td>
<td>NC</td>
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</tr>
<tr>
<td>Fire – Building</td>
<td>NC</td>
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</tr>
<tr>
<td>Fire – Other</td>
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<td>1</td>
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<tr>
<td>Flare Sighting</td>
<td>NC</td>
<td>1</td>
</tr>
<tr>
<td>Guard Scene/Hosp/Prisoner</td>
<td>NC</td>
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</tr>
<tr>
<td>Judicial Process</td>
<td>NC</td>
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<tr>
<td>Licensed Premises incident</td>
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<tr>
<td>Located Missing Person</td>
<td>NC</td>
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</tr>
<tr>
<td>Malicious / Nuisance Caller</td>
<td>NCI</td>
<td>2</td>
</tr>
<tr>
<td>Maritime security check</td>
<td>NC</td>
<td>1</td>
</tr>
<tr>
<td>Mayday</td>
<td>NC</td>
<td>1</td>
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<tr>
<td>Medivac</td>
<td>NC</td>
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<tr>
<td>Mental Health Incident</td>
<td>NC</td>
<td>1</td>
</tr>
<tr>
<td>Message for Officer/Unit</td>
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<td>1</td>
</tr>
<tr>
<td>Missing Person/Absconder/Search</td>
<td>NC</td>
<td>1</td>
</tr>
<tr>
<td>Navigation Breach</td>
<td>NC</td>
<td>2</td>
</tr>
<tr>
<td>Navigation Hazard</td>
<td>NC</td>
<td>1</td>
</tr>
<tr>
<td>No Voice 55 Call (000)</td>
<td>NC</td>
<td>1</td>
</tr>
<tr>
<td>Incident Description</td>
<td>Code</td>
<td>Count</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>------</td>
<td>-------</td>
</tr>
<tr>
<td>Noise Complaint</td>
<td>NC</td>
<td>1</td>
</tr>
<tr>
<td>Notification</td>
<td>NC</td>
<td>1</td>
</tr>
<tr>
<td>Notification of Party or Event</td>
<td>NC</td>
<td>1</td>
</tr>
<tr>
<td>Offender being Held</td>
<td>C</td>
<td>3</td>
</tr>
<tr>
<td>Offender on Premises</td>
<td>VC</td>
<td>4</td>
</tr>
<tr>
<td>OMCG Incident</td>
<td>C</td>
<td>3</td>
</tr>
<tr>
<td>Other Incident not listed</td>
<td>NC</td>
<td>1</td>
</tr>
<tr>
<td>Overdue Vessel</td>
<td>NC</td>
<td>1</td>
</tr>
<tr>
<td>Police/SJA/FESA require assistance</td>
<td>NC</td>
<td>1</td>
</tr>
<tr>
<td>Premises Insecure/Checks on Patrol</td>
<td>NC</td>
<td>1</td>
</tr>
<tr>
<td>Property located/ Evidence to Collect</td>
<td>NC</td>
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</tr>
<tr>
<td>Public Disorder</td>
<td>NCI</td>
<td>2</td>
</tr>
<tr>
<td>Public Safety (Gas, Fuel, Burst Mains, etc)</td>
<td>NC</td>
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</tr>
<tr>
<td>Pursuit Incident</td>
<td>C</td>
<td>3</td>
</tr>
<tr>
<td>Serious Threats to Harm</td>
<td>VC</td>
<td>4</td>
</tr>
<tr>
<td>Sexual Assault</td>
<td>VC</td>
<td>4</td>
</tr>
<tr>
<td>Shark Attack/Shark Report</td>
<td>NC</td>
<td>1</td>
</tr>
<tr>
<td>Shoplifter</td>
<td>C</td>
<td>3</td>
</tr>
<tr>
<td>Shots Fired</td>
<td>NC</td>
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<tr>
<td>Standby Tasks</td>
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<tr>
<td>Stealing</td>
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<td>3</td>
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<tr>
<td>Sudden Death</td>
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<td>Suspicious Person or Vehicle</td>
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<tr>
<td>Towage required</td>
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<tr>
<td>Traffic Breach</td>
<td>NCI</td>
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</tr>
<tr>
<td>Traffic Hazard</td>
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<td>Vehicle/ Name Check</td>
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<tr>
<td>Vessel Adrift</td>
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<tr>
<td>Vessel Assist</td>
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<td>Welfare Check</td>
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<tr>
<td>Wilful Exposure</td>
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</table>
Appendix C. Problem Solving and Contact Sheet Handout
EVIDENCE BASED POLICING PROJECT
Disorder call reduction by applying problem solving techniques to high repeat call for service addresses

PROBLEM DEFINITION
Identify high repeat call for service locations (primarily disorder calls)

WEEK 1
PROBLEM DEFINITION ACTIVITY
With Supervisor complete reverse of this card for:
- Problem Number
- Officer Name(s)
- High CFS address
- Total calls by month for past 3 months

WEEK 2 – WEEK 5
ANALYSIS ACTIVITY
Complete reverse of this card for each person contacted
Learn as much about the problem as possible. Contact key people and discuss their view of:
- Who the key people are
- What the problem behaviour is
- Why the problem behaviour is occurring
- Why the problem behaviour needs to be reduced or eliminated
- What resolutions might work
- Where the problem is occurring
- When the problem is occurring

WEEK 6 – WEEK 13
RESOLUTION ACTIVITY
Design, document, and implement resolution
- Discuss and agree to resolution strategy with Supervisor
- Complete Resolution card
- Document expected call volume
- Implement resolution

WEEK 14
EVALUATION ACTIVITY
Review quarterly CFS
CLOSE PROBLEM: if Calls = < expected call volume for two months
EXPAND ANALYSIS AND REDESIGN RESOLUTION: if Calls > expected call volume
<table>
<thead>
<tr>
<th>DATE</th>
<th>SHEET</th>
<th>OF</th>
</tr>
</thead>
</table>

**GEOBEAT**: ___________________________ **PROBLEM NUMBER**: _______________

**OFFICER NAME(S)**: ___________________________

**HIGH CFS ADDRESS**: ___________________________

<table>
<thead>
<tr>
<th>ALL CALLS</th>
<th>Nov-13</th>
<th>Dec-13</th>
<th>Jan-14</th>
<th>Feb-14</th>
<th>Mar-14</th>
<th>Apr-14</th>
<th>May-14</th>
<th>Jun-14</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>NAME OF PERSON(S) CONTACTED</th>
<th>DATE OF CONTACT</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>ROLE OF PERSON CONTACTED</th>
<th>NOTES</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>NAME OF PERSON(S) CONTACTED</th>
<th>DATE OF CONTACT</th>
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<table>
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<tr>
<th>ROLE OF PERSON CONTACTED</th>
<th>NOTES</th>
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<thead>
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<th>NAME OF PERSON(S) CONTACTED</th>
<th>DATE OF CONTACT</th>
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<tr>
<th>NAME OF PERSON(S) CONTACTED</th>
<th>DATE OF CONTACT</th>
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</table>

<table>
<thead>
<tr>
<th>ROLE OF PERSON CONTACTED</th>
<th>NOTES</th>
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