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Ph.D. Thesis

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COME LIE WITH ME

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On deception by groups and the concept of statement consistency

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DEPARTMENT OF PSYCHOLOGY

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Til pappa,
og resten av familien

ABSTRACT

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Research on the topic of group deception has primarily focused on co-offenders. The aim of this thesis was to further our understanding of group deception by examining the context of honest and deceptive alibis corroborated by witnesses. Specifically, the deceptive pairs contained one partly innocent member, and this setup provides a different group dynamic as compared to co-offending groups with only guilty members. Furthermore, this thesis aimed to increase our knowledge of the consistency of such corroborated statements. **Study I** examined whether the consistency of corroborated honest and deceptive alibi-witness statements was moderated by the salience of event details. In line with the expectations and previous research, all pairs obtained lower between-person consistency scores for less salient details—however, truth-tellers' consistency scores dropped considerably more than liars'. **Study II** applied strategic interviewing through memory-enhancing tactics, and examined whether this would increase the differences between honest and deceptive pairs on a within-subject measure. Contrary to the predictions, both honest and deceptive participants responded similarly to the memory-enhancing tactics. **Study III** approached the topic of counter-interrogation strategies in a new way, and observed honest and deceptive pairs' conversations while preparing for their interview in addition to collecting self-reported measures. The results partly supported the hypotheses. In line with the expectations, liars were concerned with establishing a story, keeping it simple and being consistent—and truth-tellers were concerned with being honest and detailed. However, contrary to the expectations truth-tellers were also concerned with establishing a story. **Study IV** manipulated between-person consistency in vignettes, and operationalised inconsistency both in terms of low degree of overlap as well as the presence of contradictions. The

study examined whether these different operationalisations of statement consistency affected veracity judgements. Results showed that in line with the expectations and previous research, believability was rated lower, and guilt was rated higher for contradicting versus consistent statements. However, statements with a low degree of overlap were not rated less believable or more guilty than the consistent statements, which might imply that people are inattentive to overlap as a representation of inconsistency. In sum, this thesis illustrates that whether or not honest and deceptive pairs differ in between-person consistency seems to depend on the salience of the details, but also on how consistency is operationalised. Previous group deception literature on beliefs about statement consistency and counter-interrogation strategies is dominated by self-reports, and empirical studies testing between-person consistency primarily examine the degree of overlap. In order to move the field forward, we must empirically approach these topics with a wider range of designs (such as dialogue observations and vignettes) and be aware of—and systematically examine—different operationalisations.

Keywords: group deception, alibis, statement consistency, counter-interrogation strategies, strategic interviewing

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SWEDISH SUMMARY

En stor del av tidigare forskning kring lögn har fokuserat på situationer där en person ljuger. Den här avhandlingens fokus är i stället på situationer där fler än en person ljuger, det vill säga lögner i grupp. Tidigare forskning som har studerat denna typ av lögner har i första hand fokuserat på grupper bestående av flera medbrottslingar som alla ljuger. Men även andra typer av gruppsammansättningar kan vara aktuella när trovärdigheten och tillförlitlighet ska bedömas. Ett exempel är när en person säger sig ha ett alibi för en viss tidsperiod som kan bekräftas av ett eller flera vittnen. Sådana utsagor kan antingen vara sanna, eller så kan de vara resultatet av att en person bett en annan att ge dem ett falskt alibi för att undvika misstankar. Det senare ger en situation med en grupp som består av delvis oskyldiga medlemmar. Syftet med denna avhandling var att utöka vår förståelse av dessa situationer genom att undersöka sanna och falska alibin. Vidare var syftet att utöka vår kunskap om överensstämmelsen i denna typ av utsagor.

I Studie I (n = 100) undersökte vi om överensstämmelsen mellan sanna och falska alibiutsagor påverkades av huruvida detaljerna var centrala eller perifera för händelsen. I linje med våra förväntningar och tidigare forskning så uppvisade alla par (både lögnare och sanningssägare) en lägre grad av överensstämmelse för perifera detaljer än för centrala – men graden av överensstämmelse sjönk relativt sett mer för sanningssägare än för lögnare.

I Studie II intervjuades par av deltagare (n = 194) antingen med eller utan en minnesunderlättande intervjuteknik för att undersöka om detta skulle öka skillnaderna mellan sanna och falska utsagor. Mer specifikt undersöktes både detaljnivå och överensstämmelse mellan utsagor. I motsats till hypoteserna svarade både sanningssägare och lögnare på liknande sätt när de intervjuades med den minnesunderlättande tekniken. Även om det fanns en viss skillnad i hur detaljnivån påverkades av den minnesunderlättande intervjutekniken, fanns det ingen skillnad i överensstämmelsen mellan utsagor i de olika grupperna. Vi hittade därmed lite stöd för att den minnesunderlättande intervjutekniken skulle kunna underlätta att skilja mellan sanna och falska alibiutsagor bekräftade av vittnen.

Studie III baserades på samma datainsamling som Studie II (n = 198) där en annan del av datamaterialet undersöktes. Studien granskade misstänktas förhörsstrategier genom en metod som inte tidigare använts, nämligen genom observation. Då tidigare forskning huvudsakligen har baserats på självskattningar, valde vi att dessutom observera hur de sanningsenliga och lögnaktiga paren förberedde sig inför sina intervjuer. Utöver dessa observationer ombads deltagarna även rapportera vilka strategier som de själva använde för att bli trodda under intervjun. Resultaten var delvis i linje med våra hypoteser. Som väntat var lögnare angelägna om att etablera en berättelse, samt att hålla den berättelsen enkel och konsekvent. De sanningsenliga paren var främst angelägna

om att vara ärliga och detaljerade. I motsats till våra hypoteser var dessa par, liksom lögnarna, också intresserade av att etablera en berättelse.

I Studie IV presenterades deltagare (n = 434) med en vinjett där överensstämmelsen mellan utsagor varierade på olika sätt. Mer specifikt varierade graden av överensstämmelse mellan utsagor genom graden av överlappande detaljer, samt förekomsten av motsägelser. I linje med våra hypoteser och tidigare forskning minskade trovärdigheten och skuldbedömningar ökade för motsägelsefulla förklaringar (jämfört med kongruenta förklaringar). Men förklaringar som i låg utsträckning bestod av överlappande detaljer bedömdes varken som mindre tillförlitliga eller mer skyldiga jämfört med de kongruenta förklaringarna. Detta kan tyda på att människor inte anser att graden av överlappning är ett bra sätt att tolka diskrepans.

Sammanfattningsvis visar resultaten i denna avhandling att skillnader i överenstämmelse mellan par som ger sanna och falska utsagor tycks bero på 1) hur centrala/perifera detaljerna är, och 2) hur överensstämmelse operationaliseras i de studier som genomförs. Tidigare forskning om lögner i grupp och överensstämmelse, samt intervjupersoners strategier för ifrågasättande, har dominerats av självrapportering. Dessutom har empiriska studier som undersöker överensstämmelse mellan människor och utsagor operationaliserat detta främst som graden av överlappning. För att fortsätta föra detta forskningsområde framåt måste vi närma oss dessa ämnen med hjälp av ett

bredare utbud av studiedesigner (som dialogobservationer och vinjetter). Vidare är det viktigt att vara medveten om – och systematiskt undersöka – betydelsen av olika operationaliseringar av de fenomen vi vill säga något om.

PREFACE

This thesis is based on the following four studies, which are referred to by their Roman numerals:

I. Sakrisvold, M. L., Granhag P. A., & Mac Giolla, E. (2017). Partners under pressure: Examining the consistency of true and false alibi statements. *Behavioral Sciences & the Law*, 35(1), 75-90. doi: 10.1002/bsl.2275

II. Sakrisvold, M. L., Luke, T. J., Mac Giolla, E., & Granhag, P. A. (2022). Can memory-enhancing interview tactics help distinguish honest and deceptive alibis corroborated by witnesses? Manuscript

III. Sakrisvold, M. L., Mac Giolla, E., Luke, T. J., & Granhag, P. A. (2022). What they say and what they do: A novel approach in the investigation of counter-interrogation strategies of honest and deceptive alibi-witness pairs. Manuscript

IV. Sakrisvold, M. L., Mac Giolla, E., Luke, T. J., & Granhag, P. A. (2022). Putting the consistency heuristic to the test: Are inconsistent statements judged more deceptive than consistent statements? Manuscript

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Similar to how corroborators tend to make an alibi stronger, a lot of people have helped and encouraged me during the process of writing this thesis and have—without a doubt—made it stronger. They all deserve my thanks.

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Thank you, friends and members of the research unit for Criminal, Legal, and Investigative Psychology (CLIP). It is a pleasure to be part of your group, and I am always looking forward to seeing and talking to you. One of the silver linings of the pandemic for me personally was that a lot of our group's work had to

become digital, and this has allowed me to attend considerably more of your meetings. CLIP is a great place for discussions and feedback on work-in-progress, and I appreciate all that I've learnt from each of you.

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Marthe Lefsaker Sakrisvold

Oslo, October 2022

CONTENTS

INTRODUCTION

The phenomenon of deception has interested humans for millennia. In fact, descriptions of liars date as far back as 3000 years (see e.g. Ford, 2006; Trovillo, 1939). In the last centuries, deception—and especially its detection—has also caught the attention of researchers (see e.g. Granhag, Vrij, et al., 2015; Vrij, 2008).

The majority of deception detection research has until now been conducted with individuals in focus, whereas deception detection in groups has been a neglected field of study (Granhag et al., 2013; Vernham et al., 2016; Vrij, 2008). However, situations in which the police might face multiple suspects are common (Ouellet et al., 2013; van Mastrigt & Farrington, 2009). Moreover, group deception has the potential to offer unique cues to deceit, such as the consistency of statements provided by different persons about the same event (Vernham et al., 2016). Hence, further advancing the literature on group deception should be of both theoretical and practical interest.

Several circumstances would require the investigation of more than one person (for an overview, see e.g. Vernham et al., 2016). One example is when someone provides an alibi that is corroborated by one or more witnesses. In such a situation one must consider the dynamics of a small group[1] of people who might

[1] Even though the majority of real-life group offences involve dyads, and the majority of group deception studies has focused on dyads, it is important to note the Moreland-Williams debate. This is a debate in the group dynamics literature with regards to whether or not a dyad actually constitutes a group (see e.g. Levine & Moreland, 2012; Williams, 2010).

or might not be telling the truth. This places alibis corroborated by witnesses within the subfield of group deception.

The main goal of deception detection research is to find reliable ways to differentiate between honest and deceptive statements. This marks one of the largest sub-genres of legal psychology (Granhag, Vrij, et al., 2015). Numerous cues to deception, both verbal and non-verbal, have been examined through the years (for an overview, see DePaulo et al., 2003). As this thesis focuses on group deception, one specific type of statement consistency—between-person consistency (often called within-group consistency)—is of particular interest.

Surveys of the public show that many believe that inconsistency is a sign of a faulty memory (for a review, see Fisher et al., 2013), or a sign of deception (Hudson et al., 2019; Vredeveldt et al., 2014). However, memory research shows that statement inconsistencies are common features of true memory reports (Fisher et al., 2009; Strange et al., 2014). Furthermore, deception research finds statement consistency to be an unreliable cue to deceit, with liars often being as—or even more—consistent than truth-tellers (for reviews, see Fisher et al., 2013; Vredeveldt et al., 2014). Hence, there is a discrepancy between people's beliefs about statement consistency, often called 'the consistency heuristic', and what empirical research shows (see e.g. Krix et al. 2015; Oeberst, 2012. For a discussion of this discrepancy see e.g., Fisher et al., 2013; Granhag & Strömwall, 1999; Vredeveldt et al., 2014).

The *repeat versus reconstruct hypothesis* proposed by Granhag and Strömwall (1999) is the prevailing explanation for why empirical studies find liars to obtain similar consistency levels as truth-tellers. This hypothesis is based on research on both counter-interrogation strategies and memory. In brief, the hypothesis claims that truth-tellers' common 'tell it like it was'-strategy makes them vulnerable to the reconstructive nature of memory. In contrast, liars' typical 'repeat a pre-planned story'-strategy makes them less affected by these memory processes. As a result, deceivers might be more concerned with avoiding inconsistencies than truth-tellers—which together with their strategies helps them obtain similar consistency levels.

The cognitive approach to lie detection emphasizes the different cognitive states that truth-tellers and liars inhabit. Strategic interviewing aims to exploit these differences in cognitive tasks faced by the groups, to magnify cues to deceit (Vrij et al., 2017). That is, 'strategic interviewing' is an umbrella term for several techniques developed with this goal in mind. One example relevant to the present thesis is *encouraging interviewees to provide more information* (Vrij et al., 2017). This is built on memory-enhancing tactics, which are expected to aid the memory of truth-tellers but not liars (Suckle-Nelson et al., 2010). As a result, these tactics might increase the differences between veracity groups in terms of the amount of information provided—which again could affect statement consistency.

Statement consistency can be conceptualised in several ways. This complicates research on the topic. One could say that the core principle is that

something must differ between statements (provided by different persons or at different times) for those statements to be classified as inconsistent. However, it is possible to offer various alternatives as to what this difference could entail (Oeberst, 2012). For instance, one way to think about consistency is in terms of overlap between statements, another way is in terms of contradictions. The different operationalisations can potentially influence whether differences in consistency between truth-tellers and liars are observed, hence it is problematic that how consistency is operationalised is not always clear in the existing literature.

The thesis

This thesis aimed to advance our knowledge of group deception, and statement consistency as a potential verbal deception cue. Specifically, the four empirical studies included in this thesis all focus on different aspects of group deception, set in the context of honest and deceptive alibis corroborated by a witness.

Study I advanced work on the repeat versus reconstruct hypothesis, by examining the role of the salience of event details concerning between-person consistency. Previous research has indicated that salience affects the consistency of honest and deceptive statements differently (Roos af Hjelmsäter et al., 2014), and I wanted to examine this using an objective way to measure salience. Study II added to the literature on strategic interviewing, by examining the effect of the 'encouraging interviewees to provide more information'-tactic within (as well as between) subjects in an alibi context. Previous research has indicated that this

tactic could be effective in enhancing the differences between honest and deceptive accounts (Vrij et al., 2017), but few studies have examined this focusing on within-group measures and in an alibi context. Study III increased our knowledge of honest and deceptive counter-interrogation strategies, by examining how they emerged as they prepared for their interview. Specifically, data was collected through dialogue observation before the interviews, in addition to self-reported questionnaire responses after the interviews. Previous research on counter-interrogation strategies is mainly based on self-reports—which have their limitations—and I, therefore, wanted to approach the topic differently. Finally, Study IV advanced work on statement consistency as a deception cue, by examining whether manipulating consistency in vignettes actually affected veracity judgments. It is assumed from previous research that statement consistency influences veracity judgments, but the typical design used does not let us test this. Furthermore, Study IV examined whether different operationalisations of inconsistency (i.e., degree of overlap versus contradictions) affected the results.

With the data from these four studies, the present thesis aimed to contribute to the growing body of literature on group deception in general, and specifically between-person consistency as a commonly believed verbal deception cue. The thesis targeted the following questions:

- Does salience affect truth-tellers' statement consistency more than it affects liars' in an alibi-witness context?

- Could memory-enhancing tactics assist in the detection of deception on an individual case basis (i.e., through repeated interviews) in an alibi-witness context?
- Will examining counter-interrogation strategies as they are produced in real-time at the planning stage produce different results from past research based on self-reports?
- Does statement consistency in fact influence deception judgments? And if so, is it dependent on how inconsistency is operationalised?

From a methodological perspective, this thesis also raises questions regarding how we define, code, and analyse statement consistency. And ultimately, how these choices affect our understanding and explanation of statement consistency as a verbal deception cue.

Before turning to a more detailed description of the individual studies, the outline of the thesis is as follows. First, I begin by providing an overview of deception research, and how deception detection has been approached throughout history. Second, the phenomenon of group deception, and the specific context of honest and deceptive alibi statements corroborated by witnesses, is addressed. Third, I will discuss statement consistency as a commonly believed verbal deception cue. That is, different types of consistency, its relation to strategies and memory, and how the cue applies to honest and deceptive alibis corroborated by witnesses. Fourth, strategic interviewing approaches and

memory-enhancing tactics are presented. Finally, the variation in how statement consistency is operationalised in previous literature is problematized.

Deception research: An overview

Deception can be defined as "a successful or unsuccessful attempt, without forewarning, to create in another a belief that the communicator considers untrue." (Vrij, 2008, p.15). In a legal context, statements provided by suspects, victims, and/or witnesses are common (and sometimes the only) evidence in a case (Otgaar & Howe, 2018). Therefore, whether or not this information is reliable is of high importance. As a result, the accuracy of statements has been studied vastly, both in relation to deception (see e.g. Granhag, Vrij, et al., 2015; Vrij, 2008), and to the frailties of memory (see Loftus, 2005).

In essence, the main goal of deception detection is to find reliable ways to differentiate between honest and deceptive statements. In many situations, the 'truth' cannot be accurately verified. Hence, the assessment of any statement's accuracy is likely to be shaped by other indicators. As a result, the deception research field has given a lot of attention to potential (both verbal and non-verbal) cues to deception (see e.g. DePaulo et al., 2003). How deception detection has been viewed in general, and deception cues have been approached specifically, has varied throughout history.

The emotional versus the cognitive approach to deception detection

Traditionally, deception has been linked to emotion (Kleinmuntz & Szucko, 1984). The emotional approach to lie detection is based on the assumption that people experience qualitatively different feelings when they are lying versus telling the truth. It is assumed that lying increases emotionality, such as nervousness, which in turn precipitates an emotional response that can be observed (Ekman & Friesen, 1969; Vrij, 2008). This 'emotional leakage hypothesis' has dominated both research and popular opinion on deception throughout history (Kleinmuntz & Szucko, 1984; The Global Deception Research Team, 2006; Vrij, 2008).

The cognitive approach to lie detection, on the other hand, emphasizes the different cognitive states that liars and truth-tellers inhabit. Specifically, it relies on the assumption that the acts of lying and telling the truth involve different mental processes. Examples of such processes are memory, information management, and planning (for more information, see e.g. Hartwig et al., 2010). Some theorists suggest that these different cognitive operations can lead to different observable cues without special aids (see e.g. Zuckerman et al., 1981). Others have used this theory to develop specific interview techniques aimed to increase the differences in verbal cues between liars and truth-tellers (see e.g. Granhag & Hartwig, 2015; Vrij et al., 2017). These can be divided into passive and active cognitive techniques.

One line of research, what I call the *passive cognitive approach*, is based on the idea that differences in mental processes alone will give rise to observable behavioural cues to deception. In other words, similar to the emotional approach, it predicts naturally occurring differences between truth-tellers and liars. For instance, it has been suggested that the higher cognitive complexity of lying (versus truth-telling) may lead to cues such as an increase in pupil dilation and speech hesitations (for an overview, see e.g. Zuckerman et al., 1981). Furthermore, other theorists have developed techniques within this strand of research such as Statement Validity Analysis (SVA, which emerged in forensic psychology in Sweden, see Trankell, 1963; and in Germany, see Undeutsch, 1967; For a review see e.g. Volbert & Steller, 2014) and Reality Monitoring (RM, see e.g. Johnson & Raye, 1981; Sporer, 2004). The former is a collection of several procedures for generating and testing hypotheses about the likely veracity of a given statement (Brown, 2010). The latter is an approach aimed to discriminate between memories of externally- versus memories of internally derived experiences (Sporer, 2004). Active cognitive techniques developed to elicit differences between truth-tellers and liars will be discussed below in the 'Active and strategic interviewing' section.

Both the emotional- and the passive cognitive approach to deception have been criticized. First, it is unlikely that emotional responses would be limited to liars (Kleinmuntz & Szucko, 1984). For instance, individual differences in nervousness are likely to also affect the emotionality of truth-tellers' responses

(Vrij, 2008). Moreover, the assumption of naturally occurring, observable and reliable cues to deceit in general, lacks empirical support (see e.g. Hartwig & Bond, 2011).

In fact, deception cues spontaneously displayed by liars are typically faint and unreliable. For example, an influential meta-analysis conducted by DePaulo et al. (2003) summarized the results of more than 1,300 estimates of 158 cues to deception and concluded that most cues showed no relation at all. Moreover, this absence was more common for the non-verbal cues to deceit. Another meta-analysis by Bond and DePaulo (2006) examined the accuracy of people's veracity judgments and found that across more than 24,000 judgments the mean accuracy was approximately 54% (i.e., just above the level of chance). A third meta-analysis by Hartwig and Bond (2011) presented two potential explanations for these findings; (1) that people rely on invalid cues or (2) that behavioural differences are small—or non-existent—hence there are no valid cues to deception. Hartwig and Bond concluded that rather than incorrect cue reliance, the strongest constraint on performance was the lack of valid behavioural indicators of deceit. Hence, the naturally occurring, observable cues to deceit expected by the emotional approach as well as the passive cognitive approach lack empirical support from several influential meta-analyses (but see meta-analyses finding support for content-based techniques such as SVA and RM, e.g. Hauch et al., 2017; Oberlader et al., 2016).

Group deception

Research on deception detection has mostly focused on developing an understanding of how individuals think, strategize, and behave (e.g. Granhag et al., 2013; Vernham et al., 2016; Vrij, 2008). This despite the fact that several circumstances would require the investigation of more than one person. This includes situations with alibis corroborated by witnesses, co-offenders, and multiple witnesses (Vernham et al., 2016). The current thesis focuses on the former context: alibis corroborated by witnesses.

Alibis corroborated by witnesses: An example

The alibi is perhaps the oldest documented criminal defence we have, and it is frequently used by defendants (Gooderson, 1977). Offering a story about one's timeline of events is a natural response when questioned in a criminal investigation (Culhane & Hosch, 2012). Broadly, one could say that "when a statement is offered as evidence to implicate or exonerate an individual, it becomes an alibi" (Burke et al., 2007, p. 157).

In as many as three out of four cases, alibis do not contain leads or references to any physical evidence (Culhane et al., 2013; Dysart & Strange, 2012; Nieuwkamp et al., 2016; Olson & Charman, 2012). However, corroborating witness statements are much more common (Burke & Turtle, 2003). For example, Culhane et al. (2013) found that while only 16% of their participants were able to back up their alibi with physical evidence, 63% brought corroborating witness

statements (for a recent review of alibis and corroborators, see e.g. Olson & Morgan, 2022).

As with all other statements, alibis might be truthful, mistaken, or fabricated (Burke et al., 2007). Therefore, the specific context in which someone provides an alibi corroborated by a witness (or several) is an example of a situation in which investigators would have to consider the reliability (i.e., accuracy) and credibility (i.e., trustworthiness) of several provided statements. This places it within the subfield of group deception.

When an alibi is corroborated by a witness, it might be that one group member is involved only in the planning and/or the aftermath of the offence without being an active participant in the offence itself (Vernham et al., 2016). For instance, it could be that a guilty person has asked an acquaintance to cover up their involvement in a crime (i.e., falsely claim that they were together at the time the crime took place). This provides a special kind of group deception in which one of the liars (i.e., the false corroborator) may largely be telling the truth (that is, they may actually have experienced the event the alibi is based on), but falsely add the other liar (i.e., the perpetrator) to the story. This is a different group dynamic than for instance co-offenders, in which all participants are fully fabricating a story. While there is a body of work on deception and co-offenders, there is considerably less research on guilty groups that have partly or completely innocent people within them (Vernham et al., 2016).

Research on alibis, in general, is a rather new topic (Burke et al., 2007; Nieuwkamp, 2018), and alibi researchers have only recently begun to examine how to distinguish honest from deceptive alibi statements (see e.g., Allison et al., 2012; Culhane et al., 2013; Keeping et al., 2017; Nahari & Vrij, 2014b). As an alibi that is corroborated by one or more witnesses makes a group situation, it provides the opportunity to examine the between-person consistency of these corroborated statements. This is one out of several types of statement consistency, and it is unique for group deception as there must be statements from at least two different persons. I will first explain what statement consistency is and how it relates to cognitive processes such as counter-interrogation strategies and memory. I will then go into more detail regarding the consistency between corroborated statements in an alibi-witness context.

Statement consistency and deception

Inconsistency is an often-cited reason for discrediting others (Brewer et al., 1999; Granhag & Strömwall, 2000; Krix et al., 2015; Strömwall et al., 2003). That is, when the level or content of information differs within or between statements, this tends to raise concerns about the reliability of the accounts (Brewer et al., 1999; Fisher et al., 2009). Specifically, people believe that inconsistency could be a sign of a faulty memory (for a review, see Fisher et al., 2013), as well as a sign of deception (Fisher et al., 2013; Hudson et al., 2019; Vredeveldt et al., 2014).

The belief that consistency implies truth-telling, whereas inconsistency implies lying has been dubbed 'the consistency heuristic' (Fisher et al., 2013; Vredeveldt et al., 2014). Although this heuristic may make intuitive sense, it lacks both empirical and theoretical support (Hudson et al., 2019; Strange et al., 2014). Specifically, prevailing theories (Baddeley, 1990), as well as empirical research on memory, suggest that statement inconsistencies are a common feature of true memory reports (Fisher et al., 2009; Strange et al., 2014). Furthermore, deception research finds statement consistency to be an unreliable cue to deceit, with liars often being as—or even more—consistent than truth-tellers (for reviews, see Fisher et al., 2013; Vredeveldt et al., 2014 but notice the differing findings for children and the effect of some interview approaches presented in these reviews). Hence, there is a discrepancy between people's beliefs about statement consistency and what empirical research shows (for a discussion of this discrepancy see e.g., Fisher et al., 2013; Granhag & Strömwall, 1999; Strange et al., 2014; Vredeveldt et al., 2014).

Different types of consistency

There are several different types of statement consistency (for an overview, see Vredeveldt et al., 2014). For instance, within-statement consistency refers to the consistency within one single individual's statement (see e.g. Leins et al., 2011), whereas between-statement consistency refers to the consistency between multiple statements provided by the same person on several different occasions (see e.g. Granhag & Strömwall, 1999; Hudson et al., 2019).

Furthermore, statement-evidence consistency refers to the consistency between a provided statement and any other collected, related evidence (see e.g., Granhag & Hartwig, 2015). Lastly, between-person consistency (also called within-group consistency) refers to the consistency of statements provided by multiple people regarding the same event (see e.g., Granhag et al., 2003; Strömwall et al., 2003). The latter is a potential cue that is only relevant when more than one person is interviewed about the same event, and hence is a common focus in group deception studies (Vernham et al., 2016). As already mentioned, this is also the consistency type examined in the current thesis.

The repeat versus reconstruct hypothesis

The repeat versus reconstruct hypothesis is commonly used to explain why findings from empirical research contradict the consistency heuristic. The hypothesis claims that truth-tellers—but not liars—will take their innocence for granted. That is, truth-tellers are less likely to prepare, and will spontaneously recall their statements from memory to the best of their ability. However, as human memory is a reconstructive process, it is vulnerable to different influences (see e.g. Loftus, 2003; Otgaar & Howe, 2018). This can be contrasted with liars. According to the hypothesis, they are expected to prepare a story in advance, and repeat this story across interviews—rather than reconstruct an event from their memory on the spot. Hence, we would not expect liars' consistency levels to be affected by the same memory processes that influence truth-tellers. Rather, they are expected to carefully keep track of their lie to avoid being unmasked.

Originally this hypothesis was developed for a situation with repeated interviews of one person (i.e., between-statement consistency, see Granhag & Strömwall, 1999), however, it was later extended to the situation of statements provided by multiple persons (i.e., between-person consistency, see Granhag et al., 2003).

In line with the cognitive approach to deception, the repeat versus reconstruct hypothesis point out the differences in the cognitive tasks truth-tellers and liars are facing. It is based on theory and empirical research on both counter-interrogation strategies and memory.

Strategies, memory, and consistency

When facing an investigative interview, it can be assumed that both truth-tellers and liars share a mutual goal; namely to create an impression of honesty and appear in a convincing manner (Clemens et al., 2013; Granhag & Luke, 2018). To achieve this desired goal, both truth-tellers and liars are likely to employ some sort of strategy. Hence, counter-interrogation strategies could be understood in the light of self-regulation theory (Carver & Scheier, 2011). This is a social-cognitive framework describing how people control their behaviour to avoid undesired outcomes (e.g., being perceived as guilty) and to reach desired goals (e.g., being perceived as innocent, Granhag & Luke, 2018; Hartwig et al., 2010).

Although sharing the goal of being perceived as honest, there is a major difference between the information management tasks faced by groups of truth-tellers and groups of liars. Liars will most likely have to conceal and fabricate information to mask the truth, whereas cooperative truth-tellers have no

information to conceal and attempt to provide as much information as possible. Consequently, the strategies that truth-tellers and liars employ are likely to differ due to these differences in information management (Granhag & Luke, 2018; Hartwig et al., 2010).

Empirical research on suspects' counter-interrogation strategies find truth-tellers to be 'forthcoming' and 'honest', whereas liars seem to prepare themselves for an interview and stick to their planned story (see e.g., Granhag, Hartwig, et al., 2015; Hartwig et al., 2014; Hartwig et al., 2007). That is, liars tend to restrict the information they provide in their statements (see e.g., Colwell et al., 2006; Hartwig et al., 2014; Verigin et al., 2019). Although previous studies have focused on the strategies applied by individual truth-tellers and liars, the same tendencies have been found for honest and deceptive pairs (see Granhag et al., 2013; Vrij, Mann, et al., 2010).

Liars are found to prepare for an interview to a higher degree than truth-tellers (Vrij, Mann, et al., 2010). This is explained by liars realising that it is crucial to plan and discuss together the facts and details of their fabricated story so that they 'get their stories straight' (Granhag et al., 2003). Specifically, without this planning, liars run the risk of providing statements that are inconsistent with each other, which might in turn raise doubt about their truthfulness.

Truth-tellers, on the other hand, are less likely to prepare for an interview and have a strategy. This has been explained by two social psychological concepts, the *illusion of transparency* and the *belief in a just world*. The former refers to the belief

that others can see their internal states (the illusion of transparency, see e.g., Gilovich et al., 1998; Savitsky & Gilovich, 2003), and the latter to the belief that people get what they deserve and deserve what they get (the belief in a just world, see e.g., Hafer & Begue, 2005; Kassin & Norwick, 2004; Lerner, 1980). That is, whilst truth-tellers may also think that it is important to provide consistent statements, they are more likely to think that this will happen naturally without the need to prepare (Vrij, Mann, et al., 2010).

Related to memory, the differing strategies of truth-tellers and liars lead to differences in learning and answering strategies. First, liars are more likely to employ active learning strategies, such as rehearsing their answers (Fisher et al., 2013; Hartwig et al., 2007; Hartwig et al., 2010). Truth-tellers, on the other hand, rarely employ active learning strategies—they usually simply remember the event to the best of their abilities (for a review, see e.g. Fisher et al., 2013). Second, truth-tellers and liars are also likely to adopt different answering strategies because liars are concerned that others will realize they are lying whereas truth-tellers are less concerned with believability (Granhag & Strömwall, 1999; Hartwig et al., 2007). Furthermore, recollections of an event do not only reflect the content of the stored memory, but also the process of retrieval. Thus, a difference in the retrieval process applied on two different occasions will lead to a difference in recollection—even if the contents of memory do not change (Fisher et al., 2009).

This research on counter-interrogation strategies and memory provides further support for the repeat versus reconstruct hypothesis. The forthcoming

and honest strategies of truth-tellers discussed above encourage them to reconstruct their story from memory to the best of their ability when asked to provide a statement. The restrictive 'stick to their cover story'-strategy of liars, on the other hand, encourages them to repeat their rehearsed story each time they are asked to provide a statement. These 'repeat' and 'reconstruct' strategies are predicted to promote the consistency of liars and somewhat undermine the consistency of truth-tellers (Vredeveldt et al., 2014). In addition, remembering is influenced by context and situation—which will give rise to variations in statements over time or between persons. Hence, some inconsistencies should be expected in truthful accounts.

However, one limitation of the existing counter-interrogation literature is that it is dominated by self-reports. That is, the common approach to the subject is to ask participants to report, in a post-interview questionnaire, the main strategy they applied to be believed during the interview. However, the divide between subjective beliefs and actual behaviour is well known in psychology (for a discussion, see Baumeister et al., 2007). Due to our limited insights into our own behaviour, researchers have warned about an over-reliance on self-report data (Nisbett & Wilson, 1977). This issue was addressed in Study III.

Alibis and consistency

The consistency heuristic (i.e., the assumption that consistency implies truth-telling and inconsistency implies lying) discussed earlier is also found for alibis (Burke et al., 2007). Police and jurors are found to consider adjusted

statements—in which some details are added, dropped or changed from the original statement—as inconsistent and therefore also less credible (Burke et al., 2007). This is although initial alibi statements are likely to be modified at some stage (Burke et al., 2007). The consequence is that a person providing an honest alibi may be perceived as inconsistent, which reduces his or her credibility (Burke & Turtle, 2003; Culhane & Hosch, 2004; Olson & Wells, 2004). In other words, as with deception in general, the belief prevails that inconsistency across alibi statements is a sign of inaccuracy and/or dishonesty (Berman & Cutler, 1996; Brewer & Hupfeld, 2004; Brewer et al., 1999; Culhane & Hosch, 2012). This is despite empirical evidence of the opposite (e.g., Krix et al., 2015; Odinot et al., 2013; Oeberst, 2012; Smeets et al., 2004). Again, differences in cognitive processes such as memory and counter-interrogation strategies, as well as the repeat versus reconstruct hypothesis, may account for this. For instance, the task of generating an alibi story can be cognitively demanding. To provide an honest alibi statement, the memory of the person's whereabouts (i.e., where they were and what they were doing during that time) must be available (Nieuwkamp, 2018). For an innocent person, this particular period in question might not have been of particular significance at the time. For a person planning to lie about this period at a later point in time, on the other hand, it was most likely memorable (Simon, 2012).

Attention, salience, and consistency

Attention is an important mechanism that influences the memory process both at the level of encoding and retrieval (for a review, see Muzzio et al., 2009). That is, a detail needs attention to be encoded in the first place. Furthermore, we need attention in order to retrieve the memory at a later point in time. One component that guides attention is salience.

Salience refers to the state or condition of *being prominent*. When using the term in the current thesis I refer to the property of attracting attention or being perceived as important. This is relevant for memory processes because the strength of memories depends on the centrality of the details (Christianson, 1992; Heath & Erickson, 1998). It is argued that salient details attract more attention, and thus are better encoded and remembered than peripheral details (Koriat et al., 2000; Roos af Hjelmsäter et al., 2014). Moreover, peripheral details are found to be more easily subject to memory errors, such as distortions (Roos af Hjelmsäter et al., 2008). Since we retrieve salient details more easily and reliably than peripheral details, it follows that the statement consistency between two people who have witnessed the same event should be lowest for the least salient details.

Counter-interrogation strategies might also interact with salience and consistency. As discussed earlier, liars are found to restrict the information they provide in an interview. This may be particularly likely for information they feel less sure about (i.e., peripheral information). Additionally, liars are expected to

agree on what details to mention, both salient and peripheral details. That is, small groups of liars may explicitly plan to mention few, if any, peripheral details and omit the rest. Hence, salience may have less influence on the consistency of deceptive statements. Truth-tellers, on the other hand, take their innocence for granted and are expected to worry less about potential inconsistencies in their story. Hence, different truth-tellers may be more likely to attend to, encode, and in turn recall different peripheral details.

Finally, related to attention and consistency, liars' encoding is most likely intentional—as compared to truth-tellers' more incidental encoding. That is, a person fabricating an alibi is likely to have prepared and rehearsed the deceptive alibi story before questioning. A truth-teller, on the other hand, has most likely no reason to believe that an event would be relevant for subsequent questioning (Nieuwkamp, 2018). Hence, the truth-tellers' lack of attention might result in few and/or poorly encoded memories. This is expected to result in recall that is more consistent for liars compared to truth-tellers (Cycowicz & Friedman, 1999; Ferrara et al., 1978).

In sum, differences in memory and counter-interrogation strategies might result in observable differences in statement consistency between truth-tellers and liars when considering salience. In support of prevailing ideas on counter-interrogation strategies (Granhag & Strömwall, 1999) and memory (Baddeley, 1990), Roos af Hjelmsäter et al. (2014) found that salience had a greater influence on truth-tellers' compared to liars' consistency levels. Specifically, truth-tellers

were least consistent for the least salient details and most consistent for the most salient details, whereas liars' consistency remained largely unchanged. However, Roos af Hjelmsäter and colleagues used a subjective measure of salience. The goal of Study I was to extend the work on salience and statement consistency to the specific context of alibis corroborated by witnesses, as well as objectively measure salience.

Knowledge of the strategies employed by truth-tellers and liars and the mechanisms of human memory, provide valuable insight into what people are likely to say and how they are likely to behave during an interview. As previously addressed, results indicate that naturally occurring, observable and reliable differences between honest and deceptive statements lack theoretical and empirical support (see e.g. Hartwig & Bond, 2011; Vrij, 2008, but see Hauch et al., 2017; Oberlader et al., 2016). Nonetheless, it might be possible to elicit cues through active and strategic interviewing.

Active and strategic interviewing

As differences in cognitive processes—such as counter-interrogation strategies and memory—do not seem to result in naturally occurring, reliable cues to deceit (i.e., as the passive cognitive approach expects), an *active cognitive approach* has been suggested (see Vrij, 2014 for an overview). Specifically, to obtain different and measurable responses, researchers have proposed that we need to develop interview strategies designed to avail of the cognitive differences between truth-tellers and liars (Hartwig & Bond, 2011; Vrij & Granhag, 2012). That is, the

focus is moved from passively observing deception cues, to strategically approaching the topic and ask how we actively can elicit cues to deceit. This change of focus has been called a paradigm shift in deception research (Kassin, 2012).

Research on *strategic interviewing approaches* is growing, and a number of methods have been developed and empirically examined. In a meta-analysis on the topic, Vrij et al. (2017) grouped these different methods into three broad categories: imposing cognitive load, encouraging interviewees to provide more information and asking unanticipated questions (other methods not included in this meta-analysis are the strategic use of evidence and the verifiability approach, see Hartwig et al., 2014; Nahari et al., 2014).

This thesis focuses on encouraging interviewees to provide more information. There are several ways to achieve this, for example by using a supportive interviewer (e.g. Mann et al., 2013), providing a detailed model statement (e.g. Bogaard et al., 2014), using drawings (e.g. Vrij, Leal, et al., 2010) or through the use of memory-enhancing tactics (e.g. Memon et al., 2010). The latter approach was chosen in the present thesis.

Memory-enhancing tactics and the Cognitive Interview

Memory-enhancing tactics are designed to facilitate the retrieval of memories in an interview. The cognitive interview is widely regarded as the most successful interview technique built on such memory-enhancing tactics (Memon et al., 2010). It was developed by Ron Fisher and Ed Geiselman in the 1980's (see

e.g. Fisher & Geiselman, 1992), and has evolved over the last decades. It is built on the basis of cognitive psychology—as well as borrowed concepts from disciplines such as investigative interviewing, journalism, oral history, medical interviews, and psycho-therapeutic interviews (Fisher & Geiselman, 1992).

There are three main psychological processes that the cognitive interview is built upon; (1) social dynamics, (2) memory and cognition, and (3) communication (Fisher et al., 2010). Based on these processes, several memory-enhancing tactics are proposed, including mental reinstatement, rapport building, providing a statement in reverse chronological order, and an instruction to report everything. According to Fisher et al. (2010) the cognitive interview should be thought of as a toolbox of helpful and available components, rather than a recipe with a fixed set of questions and instructions.

The cognitive interview is a witness-centered approach that relies on open-ended questions and narrative responses. That is, the information is almost exclusively generated by the interviewee—rather than responses to leading, closed questions from the interviewer. A considerable body of literature finds this interview technique to be an effective tool, and a meta-analysis from 2010 found a large and significant increase in correct details—and only a small increase in errors—compared to generally accepted interview protocols (Memon et al., 2010).

There are modified versions of the cognitive interview aimed to maximize the opportunity to detect deception, for instance the cognitive interview for suspects (see Geiselman, 2012, and for a similar interview technique called ACID

see Colwell et al., 2007). The cognitive interview for suspects begins with a free recall section to obtain free narratives. Then, the version employs two additional tactics designed to elicit information in unanticipated ways. First by retelling the story in reverse chronological order and second by making a drawing. These memory-enhancing tactics have been shown to benefit the performance of truth-tellers (i.e., people with a memory) in terms of producing longer statements, as compared to liars (i.e., people without a memory, see e.g. Colwell et al., 2007; Suckle-Nelson et al., 2010). As a result, this cognitive interview technique should, compared to a regular interview, increase the differences between truth-tellers and liars.

The memory-enhancing tactics used to encourage interviewees to say more may also interact with consistency. First, Mac Giolla (2014) argues that open-ended questions are likely to reduce between-person consistency for truth-tellers. Specifically, he argues that as open-ended questions encourage longer statements than specific questions, they should also increase the opportunities for inconsistencies to occur. Second, differences in counter-interrogation strategies is likely to enhance the differences further. That is, since liars aim to restrict the amount of information they provide and stick to their story, they are likely to keep their consistency high regardless of memory-enhancing tactics being used or not. Truth-tellers, on the other hand, who are forthcoming and do benefit from memory-enhancing tactics, are expected to be especially prone to inconsistencies when interviewed with such techniques.

To summarize, encouraging interviewees to provide more information through memory-enhancing tactics is expected to help performance by facilitating the retrieval of memories. Truth-tellers (and in the case of honest and deceptive alibi witnesses, also false corroborators) will hold a memory for the event in question, but this is not the case for liars. Combined with the fact that truth-tellers are typically cooperative and forthcoming (Kassin & Norwick, 2004), this is likely to result in an active attempt to provide the interviewer with all the information they possess. Liars, on the other hand, typically restrict the information they provide (Granhag, Hartwig, et al., 2015). Hence, although false corroborators do hold a memory of the event and in theory could benefit from memory-enhancing tactics to the same extent as the truth-tellers, this restrictive strategy is expected to reduce the effect for the lying pairs. Taken together, we would expect truth-tellers'—but not liars'—total amount of information, between-statements- and between-person consistency to be affected by memory-enhancing tactics such as encouraging interviewees to provide more information. This proposition was examined in Study II.

Operationalising and empirically approaching statement consistency

In addition to there being different types of statement consistency, the phenomenon can also be conceptualised in several ways. One could say that the core principle is that something must differ within or between statements (provided at different times or by different persons) for those statements to be

classified as inconsistent. However, it is possible to offer various alternatives as to what this difference should entail (see e.g. Berman & Cutler, 1996; Oeberst, 2012).

One way to think about inconsistency is to define it in terms of overlap. This implies a considerable difference in the level of detail between two (or more) statements. Potential reasons for such differences could simply be differences in length and richness of details between statements provided by different persons, or omissions and commissions between statements provided at different times (for more info see e.g. Vredeveldt et al., 2014). For instance, one statement could include a detail regarding a clothing such as a white jacket, whereas the other statement does not. One could regard this lack of overlap between statements as an inconsistency between the statements.

Another way to think about inconsistency is to define it in terms of contradictions. This implies differences in terms of the content of details changing between statements; that is logical inconsistencies between statements (see e.g. Brewer et al., 1999). For instance, one statement may include a description of a man as 'clean-shaven', whereas the other statement describe the same man as 'bearded'. One could regard such contradictions between statements as an inconsistency between statements.

When reviewing previous empirical work on consistency as a deception cue, overlap seems to be the more common way to understand the term. First, statement consistency is commonly defined in the literature as "the presence of

repetitions and the absence of omissions and reminiscences" (Hudson et al., 2019, p. 13). Second, it is shown by the way consistency is typically measured. That is, coders in these studies are usually given explicit instructions to for instance rate the degree of overlap or correspondence between the statements (see e.g., Mac Giolla & Granhag, 2015; Strange et al., 2014; Vrij et al., 2009. For a list of studies measuring it this way, see Vredeveldt et al., 2014). Third, a number of studies report that inconsistency in the form of direct contradictions are rare (see e.g., Deeb et al., 2017; Granhag & Strömwall, 2002; Hudson et al., 2019; Shaw et al., 2014; Strömwall & Granhag, 2005). Taken together, the empirical studies on consistency seem to primarily concern overlap and rarely refer to contradictions.

Distinguishing between whether consistency is defined in terms of overlap or in terms of contradictions is important. As previously mentioned, researchers claim a) that the consistency heuristic is widespread and b) that empirical research has shown the consistency heuristic to be erroneous. However, argument b) only holds if statement consistency is operationalised the same way in both the belief studies and the empirical studies. This may not be the case.

When collecting self-reports on beliefs about deception cues, it is rarely specified what people mean when they say they believe consistency to be a good cue to deception (i.e., whether they understand inconsistency as low overlap or as contradictions). This contrasts with what we saw above, namely that the empirical research mainly concerns overlap. Hence, when beliefs about statement consistency, and consistency as an actual cue to deception, are compared in the

literature—it might in fact be a comparison of two different things that tend to be called the same (i.e., consistency) but are understood in different ways (overlap vs. contradictions).

Finally, what we know about the cues people rely on when making veracity judgements is mostly based on self-reported beliefs. Hence, similar to the lack of variation in how to empirically approach counter-interrogation strategies (mentioned previously), this is also a limitation in the deception cue literature. Importantly, beliefs about deception cues such as statement consistency are exactly that: beliefs. That is, they do not necessarily represent what cues people actually rely on when making veracity judgements. Therefore, the field would benefit from new approaches controlling and testing how specific deception cues actually affect behaviour. Both the variation in how consistency is defined, as well as the lack of variation in how the data is collected, poses potential problems with how the narrative of statement consistency as a deception cue currently is presented in the literature. Study IV will further expand on these issues.

SUMMARY OF STUDIES

The studies included in this thesis were intended to shed light on various aspects of group deception, and specifically statement consistency as a verbal deception cue. Previous research examining these topics have mainly focused on a co-offender context (i.e., lying groups consisting of all guilty members who fabricate a story together). By contrast, the knowledge regarding lying groups containing partly or completely innocent people within them is limited (Vernham et al., 2016). Hence, the overall aim of the thesis was to increase the knowledge of group deception in an alibi-witness context, in which honest and deceptive alibis were corroborated by a witness.

More specifically, by collecting eye-tracking data, Study I examined the between-person consistency of honest and deceptive alibis corroborated by witnesses and whether this was moderated by salience. Study II investigated whether memory-enhancing tactics could assist in the detection of deception on an individual case basis (i.e., through repeated interviews) in an alibi-witness context. Study III approaches the topic of counter-interrogation strategies in a new way and analysed the dialogues of honest and deceptive pairs as they prepared for their interview. Lastly, in Study IV, statement consistency was manipulated in vignettes to investigate how this affected veracity judgments. Furthermore, inconsistency was operationalised in two different ways, both as contradictions as well as low degree of overlap.

Study I

Aim and hypotheses

The aim of Study I was to compare the between-person consistency (called within-group consistency in the article) of honest and deceptive statements and their corroborated witnesses, as well as the moderating role of object-salience. This study built on the results of Roos af Hjelmsäter et al. (2014), who found that the between-person consistency of groups of truth-tellers became weaker for less salient details, whereas salience had little effect on the between-person consistency of groups of liars. However, a limitation of Roos af Hjelmsäter et al. (2014)'s study was the subjective categorization of salience, in which some objects were simply regarded as more outstanding or prominent than others. We addressed this by applying a more objective measure of salience. Specifically, we obtained salience measures through the use of eye-tracking technology, as suggested by Borji (2015). Furthermore, Roos af Hjelmsäter et al. (2014) examined co-offender groups, whereas Study I examined an alibi-witness context. Together with theories and empirical studies on human memory, as well as the repeat versus reconstruct hypothesis, we expected the consistency between deceptive statements to be at a similar, or even higher, level than honest statements (Hypothesis 1). Furthermore, we expected salience to affect truth-tellers' consistency levels more than it would affect liars' consistency levels (Hypothesis 2).

Method

The study consisted of a laboratory experiment and employed a between-group randomized design. Participants (N = 100) were first divided into pairs of truth-tellers and liars, before following different procedures (for a similar experimental setup, see Nahari & Vrij, 2014b). Truth-telling participants were shown a photograph on a computer screen while eye-tracking data was being collected. The photo showed a crowded street scene; with a musician playing several instruments and a clown making balloon animals in the foreground, as well as a number of other people and objects in the background. Later they were instructed to imagine that they were suspected of being involved in a robbery, and that their alibi would be based on the photograph they viewed earlier. They were informed that they would be questioned about this alibi, and that their task was to convince the interviewer that their alibi was true and that both pair members had experienced the event.

The members of lying pairs were separated and allocated different roles. One member was given the role of a *perpetrator* (coined liar-crime in the article). They were given written instructions about a robbery, and asked to imagine that they conducted this while their pair member's task was to provide an alibi for them both. The other member was given the role of a *false corroborator* (coined liar-alibi in the article). They were informed that their task was to provide an alibi for them both, before being shown the same photograph as the truth-tellers while eye-tracking data was being collected. When reunited, the lying pair was informed

that the robbery had been successful; however, the police suspected that they were involved. Hence they were to be questioned about their alibi (i.e., based on the photograph that the false corroborator saw). As with the truth-tellers, their task was to convince the interviewer that their alibi was true and that both pair members had experienced the event.

All participants were interviewed once (individually) about their claimed alibi story. These interviews were transcribed for the purpose of analyses. Based on the collected eye-tracking data, objects in the photograph were identified and categorized into high-, medium- or low-level salience groups. Furthermore, based on all transcribed interviews, fine-grained measures of between-person consistency were calculated based on matches (i.e., objects in the photograph mentioned by both members in a pair) and mismatches (i.e., objects in the photograph mentioned by one pair member but not the other).

Findings and conclusion

In line with Hypothesis 1, a considerable difference between the percent of overlapping details between deceptive statements (82.43%) and honest statements (43.47%) was found. This finding is in line with both the repeat versus reconstruct hypotheses and previous research on group deception (Granhag & Strömwall, 1999; Granhag et al., 2003; Vernham et al., 2016). Furthermore, both honest and deceptive pairs showed lower levels of between-person consistency when recalling details form the event that were less salient compared to more salient (i.e., as measured by the use of individual eye-tracking measures). However,

in support of Hypothesis 2, the consistency levels between honest corroborators were considerably more affected by salience than the consistency between deceptive corroborators. That is, there was a significant interaction effect, with truth-tellers' (vs. liars') between-person consistency levels decreasing considerably more when discussing less salient objects. The latter finding complements and extends the repeat versus reconstruct hypothesis. Specifically, liars seem to repeat a pre-planned story, which is largely unaffected by whether the details they repeat are salient or not. Truth-tellers, on the other hand, seem to recall their story from memory. Hence, individual differences in attention and recall result in the less salient details being most prone to inconsistencies across statements provided by different group members.

One limitation of Study I is that participants imagined an alibi story based on a photograph, rather than an actual experience. This methodological choice was made in order to increase the accuracy of salience measures based on eye-tracking data. However, the loss of external validity means that the results should be generalized with caution. A second limitation is that lying pair members were informed about the alibi questioning prior to watching the photograph, as well as being encouraged to prepare prior to the questioning, whereas truth-tellers were not. This enabled liars, but not truth-tellers, to intentionally encode the relevant information. Research finds recall to be more accurate when encoding is intentional versus incidental (Cycowicz & Friedman, 1999; Ferrara et al., 1978). Hence, it might be that the difference between the experimental groups is a result

of memory encoding rather than deception. Furthermore, as liars were explicitly encouraged to prepare before questioning they are likely to have rehearsed and hence strengthened their memory. Truth-tellers, on the other hand, were given the opportunity to prepare when left alone after being informed about the upcoming interview—but they were not explicitly instructed to do so. However, these methodological choices were made in an attempt to mirror a situation in which a small group of people decides to prepare a false alibi before any crime has taken place. Thus, it might be hard to know whether the difference between groups was caused by the type of encoding and rehearsing, or the deception and strategies. The results may be limited to situations in which somebody intentionally decides to create an alibi for an accomplice before the event of the alibi experience takes place.

Study II

Aim and hypotheses

Study II aimed at exploiting the different counter-interrogation strategies applied by truth-tellers and liars in an alibi-witness context. Based on recent developments in the field of strategic interviewing (for an overview, see Vrij et al., 2017), Study II focused on memory-enhancing tactics to encourage interviewees to say more. A number of studies find that truth-tellers—but not liars—provide more information when encouraged to do so (Vrij et al., 2017). However, the field has been criticized for an overreliance on between-group studies (see e.g., Nahari, 2018; Vrij, 2016; Vrij et al., 2018), and few studies have examined this using a

within-subject design (but see Colwell et al., 2007; Suckle-Nelson et al., 2010 who studied this tactic with repeated interviews of individual suspects).

One reason why between-group comparisons are criticized is that they are of limited value in real-life cases. Investigators working on real-life cases rarely have a comparison group. Hence, such findings cannot provide a decision criterion as to what amount of information is sufficient to be judged as truthful or deceptive on an individual case basis (Nahari & Vrij, 2014a; Vrij, 2016). Within-subject designs, on the other hand, more closely resemble a situation in which practitioners might find themselves. Specifically, in real life, investigators usually have to base their judgment on observing single suspects—or groups of related suspects—under different conditions. Consequently, by increasing our knowledge of how an innocent or guilty suspect responds to different techniques that could be compared through for instance repeated interviews, we might be able to develop decision criterion applicable to individual cases.

Hence, Study II contributed to the field by designing the study with a specific focus on within-subject measures in an alibi-witness context. Specifically, we aimed at replicating the results of Colwell et al. (2007) and Suckle-Nelson et al. (2010) who found that memory-enhancing tactics in repeated interviews were effective in differing between guilty and innocent individual suspects. However, we applied this to the specific context of honest and deceptive alibis corroborated by witnesses—thus extending it to a group situation.

We expected truth-tellers and liars to show differential trends across repeated interviews. That is, we expected truth-tellers—but not liars—to provide more information when interviewed with memory-enhancing tactics, compared to an interview using no such tactics. Furthermore, we expected these tactics to affect both between-statements and between-person consistency (Mac Giolla, 2014). Specifically, we expected truth-tellers', but not liars', consistency levels to decrease when interviewed with memory-enhancing tactics as compared to no such tactics. Finally, we expected liars to plan their interviews, and stick to that prepared story, to a higher degree than truth-tellers.

Method

Study II and III are based on the same data collection, but analyse different parts of the dataset. The study consisted of a laboratory experiment and employed a mixed-design. Participants (N = 194) were divided into pairs of truth-tellers and liars (similar to the experimental setup in Study I and Nahari & Vrij, 2014b). Truth-telling pairs solved some logic puzzles in a canteen. Lying pairs were separated and split into a perpetrator and a false corroborator. The perpetrator performed a mock-crime (i.e., stealing a document from an office). The false corroborator performed the same task as the truth-tellers—solving logic puzzles in a canteen. Neither of the lying pair members knew what the other member was doing. Later in the experiment, all participants were informed that an important document had gone missing during the first phase of the experiment (i.e., the period in which truth-tellers and false corroborators solved tasks in the

canteen). They would soon be interviewed (individually) about their whereabouts for the time in question, and their task was to convince the interviewers that their alibi was true. Hence, lying pairs needed to pretend that the perpetrator had been together with the false corroborator the whole period—and had nothing to do with the missing document. All pairs were left for 8 minutes and given the opportunity to prepare for their interviews. These conversations were audio recorded to enable transcription and analyses. Then all participants were interviewed twice about their whereabouts; once with- and once without memory-enhancing tactics. A fine-grained coding procedure was applied to identify and count all information units provided in the transcribed planning conversations as well as all transcribed interviews. Both between-statement- and between-person consistency, as well as degree of planning and planning-interview consistency was calculated based on these measures.

Findings and conclusion

Truth-tellers provided nominally more information than liars did, however the difference was not significant. In line with hypotheses, truth-tellers and false corroborators provided more information when encouraged to do so to a higher degree than perpetrators did (although the memory-enhancing tactics did increase the amount of information provided by all groups). Also in line with hypothesis, liars both self-reported as well as were observed to prepare more, and stuck to their prepared story to a higher degree than truth-tellers. However, contrary to expectations and previous research, truth-tellers and liars showed

similar trends in terms of consistency across interviews. That is, both groups showed similar and *low* levels of both between-statement (liars = 24%, truth-tellers= 25%) and between-person consistency (liars = 19%, truth-tellers = 17%). This was the case for interviews both with and without memory-enhancing tactics. Thus, the results indicate that, under the circumstances of this study, there are small differences between how people—providing honest and deceptive alibis corroborated by witnesses—respond to memory-enhancing tactics.

One limitation that might (at least partly) explain the unexpected result is the 'weak' interview applied in this study. That is, the Cognitive Interview was compared to an interview in which only a few, short questions were asked, rather than being compared to a standard interview without memory-enhancing tactics. Other possible explanations for why our results deviate from previous findings could rely on methodological differences between the studies, such as differences in how statement consistency was coded and analysed. These aspects will be addressed in 'General discussion'.

Study III

Aim and hypotheses

The aim of Study III was to further our understanding of counter-interrogation strategies by approaching the phenomenon in a different way than previous studies have tended to do. Specifically, in addition to the traditional self-reported measures, we conducted dialogue observations to examine how

strategies are formulated in real time. That is, we observed lying and truth-telling pairs' conversations when preparing for their upcoming interview.

We took a largely explorative approach to analyse the material, but had some basic assumptions from previous literature. First, liars were expected to both prepare more and be more strategic than truth-tellers (hypothesis 1). Second, liars were expected to be mostly concerned with establishing and sticking to an agreed-upon story, whereas truth-tellers were expected to be more concerned with being forthcoming and telling it like it happened (hypothesis 2).

Method

Study II and III are based on the same data collection but analyse different parts of the dataset. General details on the experimental procedure are described in the Method section for Study II above. The element of the experimental procedure of most relevance for Study III is the planning phase, as well as the questionnaire. That is, after honest and deceptive pairs (N = 198) were informed that an interview would take place, but before the interview was conducted. Participants were asked if they had any questions, before the pairs were left for 8 minutes and given the opportunity to plan for their interview. This planning phase was audio recorded to enable their dialogues to be transcribed and coded for the purpose of analyses. After the interviews were conducted, each participant filled out a questionnaire individually. Of special interest were the questions asking participants about their preparation and strategies.

All dialogue transcriptions and questionnaire responses were systematically coded based on a coding scheme that was both theory- and data driven. First, a predefined list was made by collecting the strategies reported in previous research and combining them into one list (prior to looking at our data). Then, the presence or absence of each of the strategies in the list were marked for each dialogue transcript and each questionnaire response. Second, strategies that were found in the material but couldn't be sorted into any of the predefined categories were added to the list and marked as data-driven (for a similar process of coding data-driven categories see e.g. Clemens et al., 2013).

After examining all dialogue transcripts and questionnaire responses for both theory- and data-driven strategies, the list was evaluated. We filtered out the strategies that we considered too uncommon to constitute distinct categories of their own. Specifically, for a strategy to be included it had to be observed discussed by at least 10% of the pairs or reported by at least 10% of participants in the questionnaires—otherwise it was recoded as 'other'. After the final list of relevant strategies was decided, all material was coded again by marking the presence or absence of each of the final categories. All transcripts explicitly stating that the participants did not apply any strategy were sorted into the category *no stated strategy*. In addition, transcripts that lacked any discussions or statements of strategies were sorted into the category *lack of strategy*. Including the categories no stated strategy, lack of strategy and other, the final strategy list consisted of 24 strategies.

In addition to the strategies, a measure of the degree to which the pairs planned for the interview was calculated by counting the number of words in the planning transcripts related to either the critical event or a discussion of interview strategies and dividing this by the total number of words in the transcripts. This was calculated to obtain a measure of degree of planning, in addition to participants' self-reported preparation rated in the questionnaire.

Findings and conclusion

In line with expectations and previous research, the results showed that liars prepared more and were generally more strategic than truth-tellers (hypothesis 1). Furthermore, results partly supported hypothesis 2 and past research regarding the types of counter-interrogation strategies that truth-tellers and liars applied. Specifically, in line with expectations, liars were concerned with establishing a story, keeping it simple and being consistent—and truth-tellers being honest and detailed. However, contrary to expectations we also found similarities between veracity groups, such as truth-tellers also were concerned with establishing a story.

Finally, dialogue observations revealed that 80% of the strategies were more frequently discussed than they were reported in the questionnaire. That is, the frequency of which each strategy is reported in questionnaires might be an underestimation. As most previous research has examined counter-interrogation strategies by collecting self-reports, the literature in general might underestimate how common different strategies are, as well as how strategic truth-tellers seem

to be. For a thorough investigation of counter-interrogation strategies, future research must go beyond self-report measures.

Study IV

Aim and hypotheses

The aim of Study IV was two-folded. First, we wanted to examine whether manipulating between-person statement consistency in vignettes actually affected people's believability and guilt judgments—and how this compared to what people commonly report to believe (i.e., the consistency heuristic). Second, we wanted to operationalise inconsistency both in terms of low degree of overlap and contradictions, in order to further our knowledge of how these definitions might affect the results of empirical studies. Based on previous research we expected consistent statements to get higher believability and lower guilt ratings than inconsistent statements.

Method

The study consisted of a vignette procedure and employed a between-group design with three conditions. First, a consistent condition where statements contained a high degree of overlap and no contradictions. Second, a contradicting condition where statements contained a number of contradictions, but otherwise had a high degree of overlap. And third, a low-overlap condition where statements differed substantially in terms of overlap, but contained no direct contradictions.

Participants (N = 434) were recruited from the online participant recruitment platform Prolific. The survey took approximately 10 minutes to

complete and participants received £1.25 as a compensation. Participants started by reading a short text instructing them to imagine a police investigation in which a girl was reported missing. Participants were told that they would soon be required to read the interview transcripts of the girl's boyfriend and his roommate. Participants were further told that after reading both transcripts they would be asked a few questions about their opinion of the case.

After this, participants were randomly allocated to one of the three experimental conditions: consistent, contradicting, or low overlap. Participants were provided with two interview transcripts, one at a time. The first transcript was with the boyfriend. This transcript was identical for all participants across conditions. The second transcript was with the roommate. The content of the roommate's interview transcript was manipulated and made into three different versions, representing the three experimental conditions. In short, in the consistent condition 92% of details matched and there were no contradictions between persons. In the contradicting condition 79% of details matched and 12.5% of details contradicted each other (these were details that concerned the level of drinking and the severity of an argument). Finally, in the low-overlap condition only 42% of details matched, but there were no direct contradictions.

Participants were then asked to make both a believability and a guilt judgement—for both the boyfriend and the roommate. These were the two dependent variables, and the ratings were made on 10-point Likert scales. Moreover, they were asked to what extent the transcripts overlapped and

contradicted each other. These two latter questions worked as manipulation checks.

Findings and conclusion

In line with our expectations, the believability of the boyfriend was rated higher and guilt lower for consistent statements compared to contradicting statements. However, against our predictions, this was not the case for low overlap statements. Specifically, there were no differences in the believability and guilt ratings of the boyfriend between the consistent and the low overlap condition. Furthermore, we observed no differences between the low overlap and the consistent conditions in ratings of overlap (i.e. failed manipulation check). These results might indicate that people are not attentive to overlap as representing consistency. This could mean that the difference between what people report to believe and empirical findings on deception cues might not be as big as researchers tend to assume.

GENERAL DISCUSSION

The overall aim of the present thesis was to further our understanding of group deception, by examining the specific context of honest and deceptive alibis corroborated by a witness. More specifically, Study I examined between-person consistency and the moderating role of salience in an alibi context. Study II examined how strategic interviewing, through repeated interviewing with and without memory-enhancing tactics, would work in an alibi context. Study III provided a novel approach to examining counter-interrogation strategies, by observing the dialogues of honest and deceptive alibi witnesses at the planning stage. Finally, Study IV examined whether statement consistency in fact affects people's credibility judgments—as is typically claimed in self-report studies—by manipulating it in vignettes. Furthermore, the study examined whether these judgments were affected by different operationalisations of consistency.

In the following sections, I will discuss the implications of my main results for relevant theory and previous research. Specifically, the findings will be seen in the light of the literature on counter-interrogation strategies in groups, statement consistency as a verbal deception cue, the repeat versus reconstruct hypothesis, and strategic interviewing. As the majority of previous group deception studies have examined a co-offender context, in which all members of the lying groups are 'guilty' and have fabricated a story together, studying other types of lying groups are important to further our understanding of group deception. The specific context of honest and deceptive alibis corroborated by

witnesses separates the current studies from previous group deception studies, as the lying groups have partly or completely innocent people within them. How the chosen alibi-witness context compares to the common co-offender context will be the common thread throughout the discussion. Finally, I will discuss methodological and ethical considerations, and future research directions.

Counter-interrogation strategies in groups

Empirical research on the counter-interrogation strategies applied by truth-tellers and liars (both individuals and groups) finds liars to be more strategic than truth-tellers (see e.g. Hartwig et al., 2007; Vrij, Mann, et al., 2010). Furthermore, these groups are found to differ in their choice of strategies. Specifically, truth-tellers are mostly concerned with being forthcoming and telling what has happened, whereas liars are mostly concerned with being restrictive with details and sticking to their story (see e.g. Granhag, Hartwig, et al., 2015; Hartwig et al., 2014; Vrij, Mann, et al., 2010). Yet, the vast majority of studies examining groups' counter-interrogation strategies have focused on co-offenders (Vrij, Mann, et al., 2010. For an exception, see Nahari & Vrij, 2014b).

Many of the previous findings on co-offender strategies were replicated in the alibi-witness context used in the present thesis. Specifically, in line with previous research, deceptive alibi-witness pairs prepared more (Study II) and were more strategic than honest alibi-witness pairs (Study III). Furthermore, also in accordance with previous literature, deceptive alibi-witness pairs were concerned

with establishing a story and being consistent while honest alibi-witness pairs were concerned with being forthcoming and honest (Study III).

However, additional findings from the current studies have not been commonly reported in previous co-offending literature. Surprisingly, as with liars, many truth-tellers seemed to be concerned with establishing their story (Study III). That is, just above half (i.e., 54%) of honest alibi-witness pairs ran through what happened when preparing for the interviews. The fact that truth-tellers also seem concerned with establishing their story is not something that previous literature has emphasized (but see Vrij, Mann, et al., 2010 who also noted that truth-tellers may run through what have happened in order to refresh their memory).

Although there are indications that truth-tellers' concern with their story is qualitatively different than liars' concern (for instance that truth-tellers are not trying to be manipulative), one could argue that refreshing their memory to be able to create a credible impression is strategic in the way that they plan how to present themselves. This 'refreshing of memory to create a credible impression' is not something that truth-tellers have tended to report in questionnaires, which might indicate that they themselves do not think of it as a strategy. Perhaps previous literature's reliance on self-reports has missed the ways in which innocent people are strategic since they do not view their behaviours as strategic.

An additional finding from Study III was that the frequency of which different strategies are applied by honest and deceptive pairs might be

underestimated in typical self-report studies. Specifically, strategies were observed with a much higher degree of frequency using dialogue observations compared to self-reports (i.e., 67% of truth-telling- and 71% of lying strategies were discussed twice as often—or more—than they were reported in self-reports). Hence, as previous research mainly relies on self-reports, it might portray groups—both honest and deceptive—as less strategic than they in fact are.

Statement consistency and the consistency heuristic

The differing strategies typically applied by honest and deceptive groups may explain how liars are able to provide statements that are as consistent as truth-tellers (see e.g. Granhag & Strömwall, 1999; Vredeveldt et al., 2014). This empirical finding contradicts the consistency heuristic—the belief that consistency implies truth-telling and inconsistency implies lying—found both in the context of co-offenders and the context of alibis (Burke et al., 2007; Fisher et al., 2013; Vredeveldt et al., 2014).

Although research on co-offenders has looked at group consistency, research on alibis has primarily focused on the consistency of statements provided by the same person at different times (so-called 'between-statement consistency', see e.g. Burke et al., 2007). Thus, less is known about the between-person consistency of honest and deceptive alibis corroborated by witnesses. As the latter was the context applied throughout the studies in the present thesis, it enabled me to examine this and compare it to existing literature.

As found in previous research, the consistency of corroborated deceptive alibi statements were higher than the consistency of corroborated honest statements in Study I. Study II found that liars and truth-tellers obtained similar levels of statement consistency (both between statements and between persons). However, Study II found that both veracity groups generally obtained *low* levels of consistency, particularly in comparison with consistency levels in Study I. Although the low consistency scores might sound surprising given the way the empirical results usually are presented (that liars are often as—or even more—consistent than truth-tellers), when examining the consistency scores reported in previous literature I find that low to medium scores are commonly reported (e.g. Mac Giolla & Granhag, 2015; Roos af Hjelmsäter et al., 2014; Sooniste et al., 2016). Hence, although the consistency scores found in Study II were generally low, they broadly fit the general finding that truth-tellers' consistency levels are typically as low or even lower than liars' (Vernham et al., 2016).

The relatively low consistency levels found in Study II compared to Study I could also be explained by the different ways statement consistency was coded and calculated in the two studies. In Study I, alibis were based on a photograph of a street scene in which 22 details were identified. Statement consistency was calculated based on matches (objects in the photograph mentioned by both members in a pair) and mismatches (objects in the photograph mentioned by one pair member but not the other). In Study II, alibis were based on a more complex event, in which participants sat in a natural environment, solving logic puzzles. In

this study, statement consistency was calculated as the relative number of overlapping information units provided across statements. This was a much more fine-grained way to code detail and calculate consistency. For instance, in Study I one person describing the clown in detail and another person mentioning the clown was calculated as a match. In Study II, all additional information units describing the clown would contribute to lowering the consistency score as it lowers the overlap.

The difference in how statement consistency was coded and calculated in Study I and Study II is a likely reason for the different levels of consistency found across the studies. Such differences in how statement consistency is defined, understood, and calculated is an important factor when comparing findings across studies in previous literature as well. How to operationalise and empirically approach statement consistency, as well as counter-interrogation strategies, is the focus of the next section.

How to operationalise and empirically approach statement consistency and counter-interrogation strategies?

There are two broad ways to study statement consistency in the deception literature. First, one line of research examine whether laypeople and professionals believe statement consistency to be associated with veracity. Second, another line of research empirically examine honest and deceptive statements and try to determine whether there are systematic differences that indicate an actual

association between this verbal cue and veracity. Unfortunately, different authors have defined and operationalised consistency differently, which makes it difficult to compare results across these two strands of research.

Empirical studies investigating whether statement consistency is a valid deception cue, seem to primarily measure consistency as overlap (for an overview, see e.g. Vredeveldt et al., 2014). At the same time, self-reported studies on beliefs on statement consistency rarely specify how the term is to be understood.

The current findings shed new light on the issue that people seem inattentive to low overlap as a representation of inconsistency (Study IV). In contrast to the earlier assumption that there is a discrepancy between beliefs about statement consistency and research showing the invalidity of statement consistency as a cue to deception (for a discussion of this discrepancy see e.g., Fisher et al., 2013; Granhag & Strömwall, 1999; Vredeveldt et al., 2014), the difference in how statement consistency is conceptualised should raise questions regarding whether or not these results are comparable.

Specifically, one could ask whether empirical research really has shown the consistency heuristic to be erroneous. That is, since the empirical studies finding liars to be as consistent as truth-tellers typically measure overlap, but people seem to base their veracity judgements on explicit contradictions and not overlap (Study IV), we might need to change the narrative that is presented in the literature. Namely, the idea that people have erroneous beliefs regarding consistency as a verbal deception cue. The true belief behind the consistency

heuristic seems to be that consistency implies truth-telling and contradictions implies lying. In order to discredit this belief, one must empirically examine whether contradictions, not overlap, are a valid cue to deceit.

In addition, the variability in how statement consistency is operationalised across these strands of research (i.e., studies of beliefs versus consistency as a valid deception cue) is highly relevant for the repeat versus reconstruct hypothesis. Specifically, as the hypothesis aims to explain the discrepancy between empirical findings and people's beliefs, it should clarify that the empirical findings are telling us something about how liars are able to be as *overlapping* as truth-tellers—and say less about inconsistencies in terms of contradictions. The repeat versus reconstruct hypothesis will be discussed further in the next section.

Developing the repeat versus reconstruct hypothesis

The repeat versus reconstruct hypothesis is used to explain the empirical findings that liars and truth-tellers show similar statement consistency levels. Originally, the hypothesis was developed with repeated interviews of truth-tellers and liars in mind (see Granhag & Strömwall, 1999). It was later extended to apply to statements provided by multiple persons (in a co-offender context, see e.g. Granhag et al., 2003).

Findings suggest that the repeat versus reconstruct strategies typically found in previous deception literature also hold in an alibi-witness context.

Specifically, liars are more restrictive and careful with keeping to their story than truth-tellers (Study I). However, the present thesis also provides new insight into group deception in an alibi-witness context. For instance, Study I illustrates the importance of salience, Study III shows that truth-tellers are also concerned with their story (although in a different way than liars), and Study IV reveals that people seem inattentive to overlap as a representation of consistency. Based on these findings, three additional elements are suggested in an elaborated hypothesis; level of salience, maintenance rehearsal versus elaborative rehearsal and operationalisation of inconsistency (see Figure 1 for an illustration).

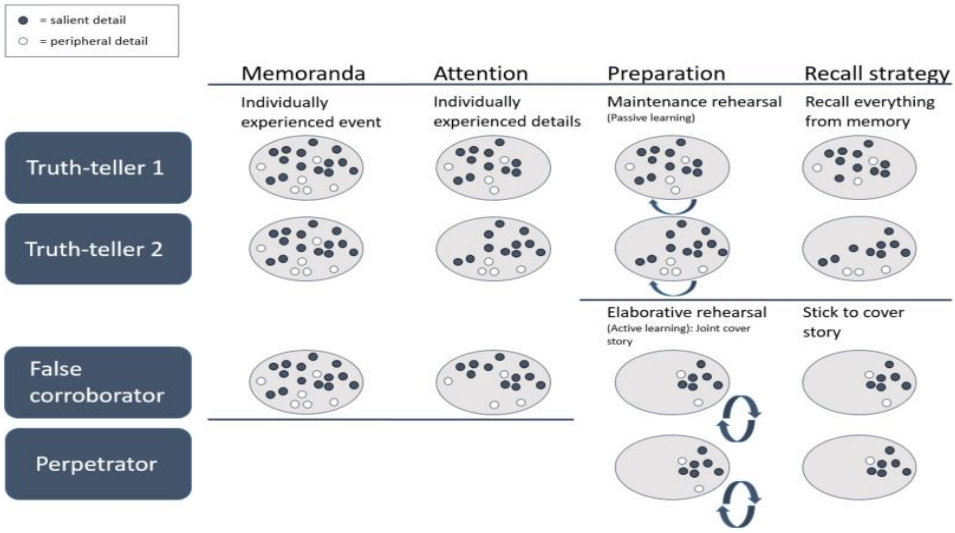
The elaborated repeat versus reconstruct hypothesis combines the original repeat versus reconstruct hypothesis with the basic ideas of the modal model of memory (proposed by Atkinson & Shiffrin, 1968). In short, the modal model is proposed to consist of three stores: sensory memory, short-term memory, and long-term memory. The sensory store is constantly receiving information from our senses, but for this information to be transferred into short-term memory, attention is needed. If information enters short-term memory it can be recalled as long as it's being maintained. Such maintenance rehearsal is the process of repeating information (verbally or mentally), usually without thinking about the meaning or connecting it to other information (i.e., passive learning). However, for information to be transferred into long-term memory, it needs to be rehearsed. Elaborative rehearsal, in which information is linked in a meaningful way, passes it on to long-term storage (i.e., active learning). Information stored in

long-term memory can be recalled back into short-term memory when needed. Although the model is criticized for being oversimplified, it provides a good understanding of the structure and process of short-term memory which allows researchers to expand on the model (McLeod, 2017).

In the elaborated repeat versus reconstruct hypothesis the first component—the *memoranda*—refers to the sensory store. This represents all sensory input in the too-be-remembered event, that has the potential of being remembered. Then, *attention* emphasizes which of all this available information is perceived, and hence transferred into short-term memory. *Preparation* specifies the type of rehearsal and learning that is applied, which affects storage in long-term memory. Finally, the *recall strategy* represents the counter-interrogation strategies typically applied by truth-tellers and liars and results in the likely outcome of details in each statement. In the modal model, this is analogous to the retrieval of information from long-term memory.

Figure 1

An elaborated repeat versus reconstruct hypothesis.



Note. This figure demonstrates the elements of the suggested, elaborated repeat versus reconstruct hypothesis. Statement consistency is illustrated through the degree of overlap between (both salient and peripheral) details—as represented by blue and white dots in the figure—between corroborated statements. 'Memoranda' refers to the experienced event in which the groups base their statement on. The circles underneath illustrate all information units present in this experience, that potentially can be remembered (both peripheral and salient details). 'Attention' refers to which—out of all the potential information in the experience—details each person actually perceives. 'Preparation' illustrates the difference in how truth-tellers and liars prepare for an upcoming interview, with truth-tellers doing some maintenance rehearsal (i.e., running through what happened) whereas liars elaborately rehearse (i.e., decide on and rehearse a restricted, joint cover story). 'Recall strategy' illustrates the different strategies truth-tellers and liars apply in order to appear truthful in their interviews. Truth-tellers try to recall as much information as possible, whereas liars try to stick to their pre-planned cover story.

As illustrated by Figure 1, truth-tellers' and false corroborators' memoranda is the individually experienced event (for instance in Study I all visual information the photograph, and in Study II every sensory information received when conducting tasks in the canteen). Based on individual differences in attention, a number of these individual experienced details are transferred into short-term memory (some of these details being salient and some being peripheral).

At the stage of preparation, liars are expected to apply active learning strategies and elaborative rehearsal to create a joint cover story they can repeat in their interviews. This story is expected to contain few peripheral details, but those that are included are rehearsed by both pair members to obtain a high degree of overlap. Truth-tellers are also expected to care about their story to some degree. However, they apply a more passive learning strategy and their rehearsal is at the level of maintenance (rather than elaborative as liars' rehearsal). That is, they quickly run through what has happened in order to be able to remember as much as possible during an interview, but do not separate between salient or peripheral details and are not concerned with the degree of overlap as they expect this to come naturally (Study I and Study III). Elaborative rehearsal, as opposed to passive rehearsal, should lead to better and more stable memories (see e.g., Bower, 2000; Craik & Lockhart, 1972; Craik & Tulving, 1975). As a result, we expect this difference in rehearsal strategies to increase the between-person statement consistency of liars as compared to truth-tellers.

Finally, the counter-interrogation strategy of sticking to their cover story applied by liars enables them to provide statements with a high degree of between-person overlap. The counter-interrogation strategy of being forthcoming and honest applied by truth-tellers makes them individually recall as much as possible to the best of their ability. However, as they have not actively rehearsed the same details, their statements are expected to contain both overlapping and different details. Low overlap will be particularly evident for the more peripheral details (Study I).

Strategic interviewing

The cognitive approach to deception emphasizes the different cognitive states that truth-tellers and liars inhabit, and strategic interviewing aims to develop interview techniques and tactics designed to avail of these differences. However, when it comes to strategic interviewing, the existing literature is primarily based on co-offenders (or other types of all guilty groups).

The present thesis targeted memory-enhancing tactics to encourage interviewees to provide more information. This tactic has been found to increase the differences between truth-tellers and liars, by helping truth-tellers but not liars produce longer statements (see e.g. Colwell et al., 2007; Suckle-Nelson et al., 2010; Vrij et al., 2017). Most previous studies have examined this using between-group designs in a co-offender context (see Vrij et al., 2017 for an overview). Still, a small number of within-subject studies exist, and these have also reported that honest participants add relatively more information in response to the memory-

enhancing tactics than lying participants (Colwell et al., 2007; Suckle-Nelson et al., 2010). Importantly, the within-group studies of Colwell et al. (2007) and Suckle-Nelson et al. (2010) did examine individual suspects. Thus it differs from the group deception focus the studies of the present thesis had.

When applying memory-enhancing interview tactics to the context of honest and deceptive alibis corroborated by a witness, results did only partly support previous findings. Specifically, the memory-enhancing tactics did increase the amount of information provided by all groups. However, in line with expectations, this tendency was weaker for perpetrators. Moreover, contrary to the expectations, both groups responded similarly to the memory-enhancing tactics in terms of consistency (Study II).

There are at least two potential explanations for why I was unable to find the memory-enhancing tactics to be effective in separating between truth-tellers and liars in terms of consistency. First, Study II used a within-subject design to measure the effect of memory-enhancing tactics in a group deception context (as compared to the individual suspects examined by Colwell et al., 2007 and Suckle-Nelson et al., 2010). This was done with the aim of testing whether these tactics—which are found by Colwell et al. (2007) and Suckle-Nelson et al. (2010) to be effective for individual suspects—could be used strategically as a potential decision criterion in real-life group cases.

Within-subject comparisons would be preferable to between-group studies on strategic interviewing research, because it would have more immediate

practical implications on how to judge the veracity of a suspect in a legal context. In real-life cases, comparison groups rarely exist. This makes group-level inferences (made from between-group studies) difficult to apply to individual cases (Nahari & Vrij, 2014a; Vrij, 2016). However, comparing how individual members of a group of suspects respond to different interview tactics would provide valuable insight. As Colwell et al. (2007) and Suckle-Nelson et al. (2010) did find that memory-enhancing tactics were effective in increasing the differences between truth-tellers and liars through repeated interviews, this cannot be the reason why I was only able to partly replicate previous findings in Study II. However, I examined honest and deceptive groups rather than individual suspects. Hence it might be that these tactics are ineffective for repeated interviews in a group context. If this is the case, one could argue that these tactics are of limited value in group deception cases.

Second, it might be that memory-enhancing tactics do not differentiate between truth-tellers' and liars' consistency levels in the specific context of honest and deceptive alibis corroborated by a witness. As previously discussed, in contrast to previous research, the deceptive alibi-witness pairs contained one member who was innocent of the crime but lied in terms of falsely adding their guilty friend to their story. This special group dynamic could be the reason why I did not see the trends found in previous research. As the 'innocent' member of the lying pairs (i.e., the false corroborator) actually experienced the same event as truth-tellers, it is not surprising that this person would be helped by memory-

enhancing tactics. What is surprising is that the false corroborator must have been less strict with the 'stick to the cover story' strategy they had planned and also later reported to have used (Study III). What is even more surprising is that the perpetrator added a substantial amount of information in response to the memory-enhancing tactics (though still less than truth-tellers and false corroborators). This is difficult to explain as the joint cover story prepared with the false corroborator should limit what additional information can be provided.

It might be that the memory-enhancing tactics made the perpetrator feel like they had no choice but to make something up in order to have more to say. In fact, one could ask whether the term 'memory-enhancing' might be a misnomer. Although components of the cognitive interview (i.e., that is meant to help the memory of interviewees) were used, maybe the tactics were not enhancing memory as much as they were simply encouraging people to say more. If this is the case, then these tactics might have an applied value in the form of pushing suspects to provide unprepared (and potentially false) information which might be checked and dismissed.

Methodological considerations

The studies that this thesis is built upon employ different methodologies and thus have different strengths and limitations that need to be addressed. Study I, II and III consisted of laboratory experiments in which veracity was manipulated between groups. These experiments intended to examine the isolated effects of different factors, such as salience, memory-enhancing tactics and

statement consistency. Nonetheless, their external validity is limited as the experimental procedures are not able to capture all the complex factors involved in real-life cases. For instance, participants know that they are being part of an experiment and are not actually suspected of any wrongdoing, thus the consequences of being disbelieved versus believed are not serious. This might affect participants' motivation to fully commit to each task, such as for instance being fully committed to being strategic and perceived as innocent in their interviews. These are potential threats to the generalisability of our results to real-life situations. Although one could argue that letting participants believe that they were really suspected of doing something wrong could have increased their motivation, that would also be ethically questionable (see 'ethical considerations' for more).

These limitations were weighted against the positives. The experimental procedures did enable us to analyse for instance object salience and the between-person consistency of statements, which would have been difficult in field studies. Furthermore, experiments are also key to examining the potential causal effects of our variables of interest on honest and deceptive reports and strategies. In general, the studies in the present thesis deals with the same issues as all other studies applying experimental procedures; trying to capture real-life phenomena within the laboratory.

Study III and IV empirically approached their topics of interest (i.e., counter-interrogation strategies and beliefs about statement consistency) in other

ways than the traditional self-reports. First, counter-interrogation strategies are typically studied using self-report measures, where people retrospectively describe the strategies they used to appear as truthful in an interview. This indirect access to people's cognitive processes by asking them to reflect on their own reasoning is common, as measuring these processes directly is difficult (if not impossible). Study III collected dialogue observations to analyse how strategies were formed in real-time at the planning stage. It is important to note that these dialogue observations happened before the interviews. Hence, it might be the case that the strategies we observed are not actually applied by participants when they are questioned. Nonetheless, the use of dialogue observations is an important methodological advancement considering the limitations of self-report. For instance, people might be influenced by social desirability (see e.g. Nichols & Maner, 2008) or lack insight into their own reasoning (see e.g. Nisbett & Wilson, 1977; van Someren et al., 1994). Furthermore, critics have pointed out the problematic trend of a steady decline in behavioural studies since the early 1980s (Baumeister et al., 2007). Originally and ideally, Baumeister et al. (2007) argue that ratings and self-reports were supposed to shed light on the inner processed of behaviour, not replace it. As such, combining knowledge obtained using both these empirical approaches has the potential to give a fuller account of the mechanisms of people's counter-interrogation strategies. Hence, the introduction of dialogue observations to the study of honest and deceptive strategies,

combined with collecting self-reports in Study III, increases our understanding of group strategies.

Second, Study IV manipulated between-person statement consistency in vignettes and examined how this affected veracity judgements. As already discussed, the divide between self-reported beliefs and actual behaviour is well known in psychology, hence researchers have warned about an over-reliance on self-report data (Nisbett & Wilson, 1977). For instance, Baumeister et al. (2007) point out that:

> People have not always done what they say they have done, will not always do what they say they will do, and often do not even know the real causes of the things they do' (p. 397)

Therefore, he argues, we need to 'try to put a bit more behaviour back into the science of behaviour (as psychology still advertises itself)' (p. 401). As such, by actually examining how statement consistency (as a commonly reported believed verbal cue to deception) affects veracity judgements, Study IV further our understanding of this concept.

On a final note, the chosen data collection methods affect for instance which participants are recruited to the experiments and the final sample sizes included in analyses. Addressing these topics is always of value, as they might have consequences for our findings and the interpretation of our findings. For instance, all four studies included in this thesis are likely to have recruited participants who differ from the general population. Specifically, the recruitment procedures for

the laboratory experiments were more likely to reach students, and the samples mainly contained students. This is known to be problematic, as generalizing from students to the general public can be problematic (see e.g., Hanel & Vione, 2016). Also for the vignette study, participants were recruited through the online recruitment platform Prolific, in which the participant pool is likely to differ from the general population. In addition, as the data collections for the laboratory experiments were both time-consuming and expensive, the sample sizes of these studies are limited. Small samples have several potential unwanted consequences, such as limited statistical power and precision. One possible suggestion for how researcher might address this practical problem in the future is through multi-lab collaborations for laboratory experiments. This would provide an opportunity to increase both sample size and generality by sampling from more than one place.

Ethical considerations

Ethical review and approval was not required for any of the studies included in the current thesis in accordance with the local legislation and institutional requirements. All participants provided their written, informed consent prior to participating in any of the studies. The collection, as well as the storage of data was approved by the Norwegian Social Science Data Services (NSD) before recruitment of participants began.

Although the nature of the included studies did not require an ethical board to review and approve them, the welfare of participants involved in research should always be addressed. In the experiments conducted for Study I,

II and III, half of the participants were told to lie in a mock-interview (and in Study II and III also perform a mock-crime). Participants were told that all individuals they would meet throughout the experiment were aware that this was an experiment and that it was a mock-crime. Furthermore, as some participants—even with the knowledge that it was mock-interviews—may have felt hesitant or uncomfortable with lying, participants were reassured that they could end their participation at any time and still receive their compensation. Out of 302 participants recruited to Study I, II and III, one participant choose to withdraw from participation.

Future directions

In this thesis, I suggest an elaborated repeat versus reconstruct hypothesis, and future studies should explicitly investigate this. There are several components of this modified version that could be examined. For instance, future empirical studies should focus on contradictions, as opposed to overlap, to suggest whether and how that fits into the model. Second, as Study I found clear differences with salience affecting truth-tellers' consistency levels considerably more than liars' consistency levels, more studies are needed to investigate this effect further (for similar results, see Roos af Hjelmsäter et al., 2014). Importantly, the statements provided in this study were based on a photograph. First, looking at a picture and being instructed to imagine this into a context is obviously different than a real-life experience. Furthermore, the visual information available in a picture is far from representing the complexity of sensory information in such

a real-life experience. Hence, it would be of value to examine the relationship between salience and statement consistency under more natural circumstances, for example using video—or even eye-tracking glasses to more closely resemble a real-life experience (see e.g. Mele & Federici, 2012 for a review of how such technological solutions could be applied in psychological research). Third, although Study III expanded our knowledge on counter-interrogation strategies by observing and analysing dialogues at the planning phase, more studies going beyond the typically self-reported studies are needed. Specifically, mapping to what degree self-reports underestimate how strategic both liars and truth-tellers are would be valuable knowledge. One suggestion is to conduct think-aloud procedures, which would complement the self-reports and observational measures (see e.g. van Someren et al., 1994). For instance, this could be done by having participants watch videos of their own interviews and explain what they were thinking and how they strategized. Finally, the elaborated repeat versus reconstruct hypothesis that I suggest in the present thesis are based on findings from an honest and deceptive alibi-witness context. Future studies could also test the abovementioned components in a traditional co-offender context. For instance, do co-offender pairs follow the same pattern as deceptive alibi-witness pairs when it comes to salience?

Future work could also further examine memory-enhancing tactics. Are these tactics in fact making participants provide more information by helping their memory? Or are they making participants add more information simply by giving

them the impression that they will be perceived unhelpful if they do not? Although both explanations would lead to more information being added, one practical difference is if it will matter whether or not the interviewee in fact is basing the statement on an autobiographical memory. That is, it is assumed that memory-enhancing tactics will help people with—but not people without—a memory to retrieve more information (see e.g. Colwell et al., 2007; Suckle-Nelson et al., 2010). If these tactics do not actually help memory performance, this assumption is incorrect, hence it will be less effective as a deception detection technique.

Another area worthy of note for future research is the need to continue testing different deception cues by manipulating them in experimental procedures. In the same way as Study IV put the consistency-heuristic to the test in a vignette study, other beliefs that are typically found in self-reported studies could be examined. For instance, verbal cues such as claiming memory loss could be manipulated in vignettes, and non-verbal cues such as gaze aversion could be manipulated in videos, before having participants make veracity judgements. This would contribute to work against the tendency that psychology, the science of behaviour, is becoming the science of self-reports (Baumeister et al., 2007).

Conclusion

The present thesis adds to the literature on 'group deception' in general, as well as 'statement consistency' as a potential verbal deception cue. Vernham et al., (2016) found that the vast majority of group deception studies examined co-

offender groups containing only guilty members. As real-life is not necessarily this clear-cut, they called for studies exploring mixed guilty groups (i.e., with partly or completely innocent members within them). The present thesis contributed to this literature by examining the specific context of honest and deceptive alibis corroborated by witnesses.

The results indicate that some previous co-offender findings tend to hold also for an alibi-witness context, whereas other findings do not. For instance, the general trend of liars being more strategic than truth-tellers seem to hold for an alibi-witness context. Nevertheless, both truth-tellers and liars might be more strategic than what is portrayed in previous literature. This was found when honest and deceptive strategies were empirically approached with an observational design, as compared to the commonly used self-report questionnaire designs.

Furthermore, in line with previous research, the corroborating statements of deceptive alibi witnesses were found to be similar to the corroborating statements of honest alibi witnesses in terms of overlap. Nonetheless, the results of the present thesis also provided new, valuable insight into the consistency heuristic discussion. That is, one significant discrepancy that is problematized in existing deception detection literature is that a) people believe inconsistency to be a sign of deception, and b) empirical research finds liars to be as consistent as truth-tellers. However, the vast majority of empirical studies examining statement consistency operationalise it in terms of overlap (rather than contradictions).

Importantly, I find that people seem inattentive to overlap as a representation of consistency. As a result, it might be that the consistency heuristic discussion is in fact conflating two different things that tend to be called the same (i.e., consistency), but are understood in different ways (overlap versus contradictions). Confusing these two ways to understand consistency could have practical, theoretical and methodological implications. For instance, for theoretical explanations such as the 'repeat versus reconstruct hypothesis' to have any predictive value, a specification of what kind of consistency the model is based on is needed. This is done in the elaborated version of the hypothesis suggested in the present thesis. Furthermore, studies operationalising consistency differently might not be comparable.

Considering all this, differences in how the concept of statement consistency is understood, empirically approached and measured clearly affect the results. Hence, we must be aware of the choices we make when studying these topics, and make sure that different group deception contexts are examined with a wide range of designs to provide us with a more complete picture of the field.

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APPENDIX

I. Sakrisvold, M. L., Granhag P. A., & Mac Giolla, E. (2017). Partners under pressure: Examining the consistency of true and false alibi statements. *Behavioral Sciences & the Law*, 35(1), 75-90. doi: 10.1002/bsl.2275

II. Sakrisvold, M. L., Luke, T. J., Mac Giolla, E., & Granhag, P. A. (2022). Can memory-enhancing interview tactics help distinguish honest and deceptive alibis corroborated by witnesses? Manuscript

III. Sakrisvold, M. L., Mac Giolla, E., Luke, T. J., & Granhag, P. A. (2022). What they say and what they do: A novel approach in the investigation of counter-interrogation strategies of honest and deceptive alibi-witness pairs. Manuscript

IV. Sakrisvold, M. L., Mac Giolla, E., Luke, T. J., & Granhag, P. A. (2022). Putting the consistency heuristic to the test: Are inconsistent statements judged more deceptive than consistent statements? Manuscript