Detecting lies about past and future actions: The Strategic Use of Evidence (SUE) technique and suspects' strategies

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Abstract

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In legal settings, it is of paramount importance to correctly discriminate between truthful and deceptive statements. Research has however shown that people generally only obtain accuracy rates around the level of chance. The *Strategic Use of Evidence* (SUE) technique is an approach that aims to make veracity judgements more accurate by actively eliciting cues to deception and truth. In the current thesis the SUE-technique was tested on child mock suspects who were interviewed on their past actions (Study I) and on adult mock suspects who were interviewed on their intentions (Study III). In addition, the thesis explored adult mock suspects' counter-interrogation strategies in interviews on their past actions (Study II) and their intentions (Study IV). In **Study I** 84 children (guilty or innocent of a mock crime) were either interviewed with a late (SUE) or an early evidence disclosure technique. Omissions and inconsistencies emerged as cues to deception and were more pronounced as a function of late compared to early disclosure of evidence. 168 receivers, who assessed the veracity of the children's statements, obtained an accuracy rate above chance level (59.5%). The observers in the late disclosure condition performed better than chance, whereas the observers in the early condition did not. **Study II** investigated to what extent guilty mock suspects' (N = 90) disclosure of possibly self-incriminating information was moderated by (a) their criminal experience (naïve vs. experienced) and (b) the degree of suspicion directed towards them (low vs. high). Experienced (vs. naïve) suspects volunteered less self-incriminating information and admitted to having committed less actions fitting with the crime under investigation. Experienced suspects' willingness to report information was not affected by the degree of suspicion, whereas naïve suspects in the high-suspicion (vs. low-suspicion) condition were more willing to report information. In **Study III** 120 participants either planned a criminal or a non-criminal act. Before completing the planned act, they were intercepted and asked both about their intentions and the phase in which they formed their intentions (planning phase). Each participant was interviewed with one of three interview techniques: Early evidence disclosure or one of two versions of the SUE-technique. Liars' (vs. truth tellers') statements (on their intentions and on the planning phase) were less consistent with the evidence. This difference was magnified as a result of using the SUE-technique. **Study IV** examined mock suspects' (N = 120) counter-interrogation strategies when anticipating questions on their intentions. The suspects were also asked a set of unanticipated questions on the planning phase. Liars (vs. truth tellers) perceived the questions on the planning phase as more difficult to answer. Liars' most commonly used strategy was to *Stick to the cover story*, whereas truth tellers' most common strategy was to *Be honest*. The results of the current thesis are an important contribution to making deception detection assessments more reliable.

Keywords: deception detection, strategic use of evidence, counter-interrogation strategies, true and false intentions

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Svensk sammanfattning

I rättsliga sammanhang är det av största vikt att kunna skilja på sanningsenliga och falska uttalanden. Forskning om lögndetektion har dock visat att varken lekmän eller förmodade experter inom rättsväsendet i normalfallet uppnår högre andel korrekta bedömningar än slumpnivå (50%). En anledning till den låga andelen korrekta bedömningar är att beteendemässiga skillnader mellan de som ljuger och de som talar sanning är små. En annan anledning är att det finns ytterst få pålitliga tecken på lögn. Forskningen har t.ex. inte visat stöd för populäruppfattningen att lögnare tittar åt ett visst håll. En idé som man i forskningen har börjat prova ut är att utveckla olika förhörstekniker som försöker göra skillnaden mellan de som ljuger och de som talar sanning mer framträdande och därmed öka antalet korrekta tillförlitlighetsbedömningar. Detta avhandlingsarbete ger en överblick över olika förhörstekniker och jämför dem på olika dimensioner. En förhörsteknik som inte endast ökar skillnader mellan misstänkta som ljuger respektive talar sanning utan också syftar till att aktivt ta fram tecken på lögn och sanning är *Strategic Use of Evidence* (SUE) tekniken. SUE-tekniken utnyttjar potentiella skillnader mellan lögnare och sanningssägare, i situationer när de inte vet vilka bevis som finns emot dem. Mer specifikt är det troligt att lögnare som blir intervjuade – och inte vet vilken misstänkliggörande information (dvs. bevis) som finns emot dem – tenderar att tillhandahålla detaljfattiga utsagor och att ge information som motsäger bevisen. Utifrån socialpsykologisk teoribildning kan man förvänta sig att sanningssägare i samma situation kommer att ge information som är i linje med dessa bevis. SUE-tekniken har hittills använts och testats i olika situationer. I detta avhandlingsarbete testades SUE-tekniken för första gången på äldre barn (12-14 år) som deltog som ”misstänkta” och blev intervjuade om sina tidigare handlingar (Studie I) och på vuxna som blev intervjuade om sina framtida handlingar (dvs. intentioner) (Studie III). SUE-tekniken är baserad på det teoretiska antagandet att sanningssägare och lögnare använder olika strategier under ett förhör för att bli uppfattade som trovärdiga. Även om det är av stor vikt att studera misstänktas strategier, eftersom dessa bidrar till att förutsäga misstänktas beteenden i ett förhör, har forskningen inom lögndetektion för det mesta ignorerat detta område. Att öka kunskapen kan bidra till att förbättra strategiska förhörstekniker som syftar till att få fram en hög grad av korrekt information och därmed hjälpa bedömarna att bli mer korrekta i sina beslut om vilka misstänkta som talar

sanning respektive ljuger. Avhandlingen ökar kunskapen om misstänktas strategier genom att undersöka misstänktas strategier när de blir intervjuade om sina tidigare handlingar (Studie II) respektive sina intentioner (Studie IV). De personer som undersöks i avhandlingens studier var inte misstänkta för verkliga brott, utan deltog frivilligt i studier som innehöll konstruerade men realistiska brottsupplägg. Detta av både etiska och praktiska skäl.

Studie I bestod av två experiment. Det första syftade till att få fram diagnostiska ledtrådar till lögn genom att jämföra två sätt att använda de tillgängliga bevisen (sent bevisavslöjande enligt SUE-tekniken jämfört med tidigt bevisavslöjande) vid förhör med 12-14-åriga barn (N = 84) som antingen talade sanning eller ljög om en tidigare utförd handling. Resultatet visade att de som ljög utelämnade mer kritisk information än de som talade sanning. Vidare stämde utsagorna från de som ljög mindre överens med bevisen än utsagorna från de som talade sanning. Detta var tydligast när bevisen avslöjades sent i förhöret. Experiment 2 undersökte om de ledtrådar till lögn som togs fram i Experiment 1 hjälpte bedömare (N = 168) att upptäcka vilka barn som talade sanning och vilka som ljög. Resultaten visade en korrekt svarsnivå på genomsnitt 59.5% vilket var över slumpnivå. Bedömarna i sent bevisavslöjande-betingelsen presterade bättre än slumpnivån, medan bedömarna i tidigt bevisavslöjande-betingelsen inte gjorde det.

I **Studie II** undersöktes vilka strategier misstänkta personer (N = 90) använder sig av, med avseende på information som kan avslöja dem. De som undersöktes låtsades att ha begått ett brott för att sedan ljuga om detta i ett förhör. Specifikt undersöktes i vilken grad avslöjandet av informationen modererades av (a) den misstänktes brottsliga erfarenhet (flerårig brotts-erfarenhet jämfört med ingen tidigare erfarenhet), och (b) graden av misstanke riktad mot den misstänkte (låg eller hög). Resultaten visade att de misstänka med en kriminell historia lämnade mindre självavslöjande information i den initiala fria återgivningsfasen. När de blev tillfrågade om brottsspecifika frågor, gick de erfarna misstänkta med på mindre handlingar som stämde överens med brottet i fråga. De erfarna misstänktas benägenhet att dela med sig av information påverkades inte av graden av misstanke de hade riktad mot sig, medan de naiva misstänkta var mer benägna att dela med sig av information när de hade hög grad av misstanke riktad mot sig.

Studie III undersökte hur man kan ta fram pålitliga tecken på lögn och sanning när misstänkta blir intervjuade om både sina intentioner (framtida handlingar) och tidigare planering (av dessa framtida handlingar) när förhörsledaren har bevis om den tidigare planeringen. De 120 deltagarna planerade en handling som var antingen brottslig eller legal. Innan försöksdeltagarna kunde genomföra den planerade handlingen blev de

stoppade och intervjuades både om sina intentioner och motsvarande tidigare planering. Varje deltagare intervjuades med en av tre förhörstekniker: En där bevisen avslöjades tidigt eller en av två versioner av SUE-tekniken (antingen ställdes frågor om planering eller intentionerna först). Samtliga förhör transkriberades och kodades med avseende på tre möjliga jämförelser som användes som beroendevariabler i analyserna. De deltagare som ljög uppvisade större brist på överensstämmelse för de jämförelser som byggde på bevisen (utsagan om planeringen/bevis om planeringen respektive utsagan om intentionen/bevis om planeringen). Gällande förhörsteknikerna visade analyserna att de båda SUE-versionerna utvann fler ledtrådar till lögn än tidigt bevisavslöjande; detta gällde för både intentions- och planeringsdelarna. Dessutom visades att de misstänkta strävade efter en hög korrespondens i sina utsagor om intentionen och planeringen.

I **Studie IV** undersöktes de strategier som misstänkta har inför förhör om sina intentioner. Data emanerade från omfattande frågeformulär ifyllt av de misstänkta i Studie III. Frågorna gällde olika aspekter av både planeringsfasen och själva intentionerna, med svaren givna på skattningsskalor. Deltagarna fick dessutom fritt ange sin huvudsakliga strategi. Både de som ljög och de som talade sanning upplevde frågorna om planeringsfasen som mer oväntade än frågorna om intentionerna. Frågorna om planeringen var svårare att svara på för de som ljög än de som talade sanning. Ingen sådan skillnad hittades för frågorna om intentionerna. De som talade sanning upplevde att det var svårare att svara på frågor om intentionerna än om planeringsfasen. I en data-driven innehållsanalys av strategierna hittades olika strategier för de misstänkta som ljög respektive talade sanning i förhöret. De som ljög använde främst strategin att hålla sig till sin ”cover story”, att undvika att ljuga mer än nödvändigt och att hålla sig lugn under förhöret. Sanningssägarnas favoritstrategi var att uppföra sig sanningsenligt och lugnt.

Tre slutsatser kan dras av detta avhandlingsarbete. Den första är att det går att aktivt ta fram diagnostiska ledtrådar till lögn och sanning när man på ett strategiskt sätt, utifrån den tillgängliga informationen, förhör äldre barn om deras tidigare handlingar (Studie I), och när man intervjuar vuxna om deras intentioner (Studie III). Detta är något som inte har testats i tidigare studier. Den andra slutsatsen är att misstänkta som ljuger tenderar att hålla sig långt borta från sanningen i förhören, och detta gäller än mer för de misstänkta som har erfarenhet av att ha varit förhörda i polisutredningar (Studie II). Den tredje slutsatsen som kan dras utifrån avhandlingsarbetet är att när misstänkta räknar med att få frågor om sina intentioner, kommer deras förhörsstrategier att återspegla denna förväntan, dvs. de kommer i första hand förbereda och använda strategier inriktade på att dölja sina verkliga

intentioner (Studie IV). Detta tyder på att misstänkta inte använder strategier som kan hjälpa dem att svara på oförutsedda frågor, exempelvis frågor om planeringsfasen. Förhörsledare kan därför dra nytta av att fråga misstänkta oförutsedda frågor om planeringen av de angivna intentionerna och inte bara om intentionerna i sig. Sammanfattningsvis ger avhandlingen ett viktigt bidrag till forskningsområdet förhör och tillförlitlighetsbedömningar på så sätt att SUE-teknikens grundantaganden får stöd och att tekniken visar sig fungera i tidigare ej utforskade situationer.

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Franziska Clemens
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List of Publications

This thesis consists of a summary and the following four papers, which are referred to by Roman numerals:

I. Clemens, F., Granhag, P. A., Strömwall, L. A., Vrij, A., Landström, S., Roos af Hjelmsäter, E., & Hartwig, M. (2010). Skulking around the dinosaur: Eliciting cues to children's deception via strategic disclosure of evidence. *Applied Cognitive Psychology, 24*, 925-940. doi:10.1002/acp.1597

II. Granhag, P. A., Clemens, F., & Strömwall, L. A. (2009). The usual and the unusual suspects: Level of suspicion and counter-interrogation tactics. *Journal of Investigative Psychology and Offender Profiling, 6*, 129-137. doi:10.1002/jip.101

III. Clemens, F., Granhag, P. A., & Strömwall, L. A. (2011). Eliciting cues to false intent: A new application of strategic interviewing. *Law and Human Behavior, 35,* 512-522. doi:10.1007/s10979-010-9258-9

IV. Clemens, F., Granhag, P. A., & Strömwall, L. A. (2013). Counter-interrogation strategies when anticipating questions on intentions. *Journal of Investigative Psychology and Offender Profiling, 10,* 125-138. doi:10.1002/jip.1387

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Introduction

The interview with a suspect is one of the more crucial stages in the investigative process. Memon, Vrij, and Bull (2003) state that the primary aim of an investigative interview is to obtain information about the crime in question from a person who is expected to be linked with the crime. As this information can be used for "further enquires and perhaps judicial purposes" (Gudjonsson, 2003, p. 2), it is essential that it is correct. Therefore, it is of particular importance that the outcome of an investigative interview confirms the suspect's veracity status. That is, if a suspect is innocent, an interview should confirm their innocence and if a suspect is guilty, an interview should confirm their guilt. Unfortunately, quite an extensive number of real-life cases paint a different picture. Police officers, who interview suspects in ways that mainly aim at eliciting a confession, or poorly executed interviews that make an innocent person seem guilty and allow a guilty person to walk free, demonstrate the dangers of poorly conducted interviews (e.g., Tommie Karim case in Sweden, Granhag & Vrij, 2010). Beyond that, deception detection research repeatedly showed that people are not very skilled in distinguishing between truthful and deceptive statements and generally obtain accuracy rates around the level of chance (Bond & DePaulo, 2006). Presumed lie experts working within the legal field are not significantly better at detecting lies than lay people (Bond & DePaulo, 2006; Vrij, 2008), contrary to what might be expected.

These results are alarming, since it is of major importance for the legal system that people are able to correctly discriminate between truths and lies. A central question that follows is: Why are people so poor at distinguishing truths from lies? One explanation is that differences between truth tellers and liars are very subtle (Vrij, 2008) and that strong and reliable cues to deception do not exist (e.g., DePaulo et al., 2003; Vrij, 2008). If this explanation is correct, a possible solution to the problem would be to make the small, but existing, differences between truth tellers and liars more salient. This could be done during the investigative interview by actively eliciting reliable cues to deception and truth. The active elicitation of cues is a rather new approach and will be the focus of the current thesis.

People who aim to detect truths and lies (henceforth referred to as *receivers*) can face one of the following two situations: (1) They have some

sort of evidence that indicates the suspect's guilt or (2) They do not have evidence that indicates the suspect's guilt. Virtually all deception research deals with the no-evidence situation. Today it stands clear that much of the previous deception detection research has failed to mirror real-life forensic situations and has focused on factors other than the evidence at hand (e.g., familiarity of the receiver with the person who lies/tells the truth). In most real-life situations the investigator holds some sort of critical information (evidence) pointing to the suspect's guilt (e.g., Wagenaar, van Koppen, & Crombag, 1993). Therefore, the fact that these situations are under-researched cannot be explained as being because they do not occur in legal settings. The so-called *Strategic Use of Evidence* (SUE) technique, which is the focus of the present thesis, is an approach that takes the available evidence against the suspect into account. Beyond that, the SUE-technique aims to actively elicit cues to deception and truth (e.g., consistency of the statement with the evidence as a cue to truthfulness, inconsistency of the statement with the evidence as a cue to deception) by using the available evidence in a strategic manner during the interview. Empirical research conducted over the last 10 years has demonstrated the efficacy of the SUE-technique (e.g., Hartwig, Granhag, Strömwall, & Vrij, 2005; Hartwig et al., 2011; Jordan, Hartwig, Wallace, Dawson, & Xhihani, 2012; Sorochinski et al., 2013). Nonetheless, there are still unanswered questions with respect to the SUE-technique, some of which will be addressed by the current thesis.

One such unanswered question is whether the SUE-technique is applicable in situations in which the suspect is a child, as all previous studies on the SUE-technique were conducted with adult suspects. As children can, in the same way as adults, be under suspicion of many forms of wrongdoings, it is crucial to establish knowledge about how to correctly assess the veracity of children's statements. The first study included in the present thesis attempts to remedy this shortcoming by testing the SUE-technique in an interview situation in which child mock suspects are questioned about their past actions (Study I). As a proper test of the SUE-technique demands a rather complex setup and previous research has shown that as children get older, they start to consider the receiver's mental state and will therefore become better liars (Leekam, 1992), older children (12-14 years) were used as participants in the study. Children within this age group were expected to be sufficiently developed in terms of their cognitive and verbal capacity.

Another unanswered question relating to the SUE-technique is whether it can be applied to situations in which suspects are asked about their future actions (i.e., *intentions*). Not only research conducted on the SUE-technique,

but virtually all deception research concerns liars and truth tellers talking about their past actions (Granhag & Strömwall, 2004). This is remarkable after more than 40 years of systematic research on deception and its detection (Vrij, 2008) and considering the frequency and importance of situations calling for assessments of whether a person is lying or telling the truth about their future actions (e.g., stated reasons for crossing a border or entering a stadium) (e.g., Andrew, Aldrich, & Wark, 2009). Study III aims to add knowledge to this area by applying the SUE-technique to interview situations in which adult mock suspects either lie or tell the truth about their intentions.

The SUE-technique is based upon the theoretical assumption that truth tellers and liars employ different strategies during an investigative interview (i.e., *suspects' counter-interrogation strategies*) (e.g., Granhag & Hartwig, 2008). Although it is of great importance to learn about suspects' strategies, as this can help to predict their responses in an interview, deception research has for the most part neglected this area of research (Granhag & Vrij, 2010). Increasing the knowledge in this field could help to refine and improve strategic interview techniques that aim at eliciting a high degree of correct information and thus help receivers to become more accurate. Therefore, the current thesis advances the knowledge on suspects' counter-interrogation strategies by examining mock suspects' counter-interrogation strategies in interviews on their past actions (Study II) and their future actions (i.e., intentions) (Study IV).

In the following sections of this thesis, I firstly demarcate central terms and provide definitions of key concepts. In the two sections after this I review general research on deception detection, give an overview of different interview approaches to detect deception and evaluate these on different dimensions. This is followed by a presentation of the theoretical framework, and a summary of empirical research conducted on the SUE-technique and the detection of criminal intent. After that, I give an overview of the four studies included in the current thesis. In the concluding section, I discuss the findings of the current thesis in relation to previous research findings.

Definitions and Demarcations

In the following section I demarcate four central terms that will be used frequently in the current thesis. First, I reflect on the terms *investigative interview* and *interrogation*. In many places in the world (e.g., the UK and the USA), a distinction is made between these terms, I would therefore like to clarify at this early point that the focus of the current thesis is on investigative

interviews, not interrogations. An interrogation is confrontational and accusatory according to practice in, for example, the USA. This style of questioning suspects lacks empirical support and is mainly based on the personal experiences of police interrogators when trying to extract information from witnesses, victims and suspects (Christianson & Holmberg, 2008). In contrast, the main purpose of an investigative interview is to obtain information about the crime in question from a person who is expected to be linked with the crime (e.g., witness, victim or suspect) (Memon et al., 2003). In an investigative interview, the interviewee is the person of interest as they hold the information of interest. The investigative interview is based on scientific principles and builds on empirically tested interview techniques, such as the Cognitive Interview (Christianson & Holmberg, 2008). In the current thesis investigative interviews were conducted with mock suspects.

In the current thesis the terms *innocent suspects* and *guilty suspects* are frequently used. A reasonable point of critique is that in a real-life setting these terms would be pointless and even incorrect, as the main feature of a suspect is that their innocence or guilt is not yet determined. However, the current thesis does not examine real-life police interviews. Instead, experimental studies were conducted in which the ground truth was at all times known. This means, although participants were acting as suspects, the experiment leader always knew about the veracity status of the suspects. The terms *guilty* and *innocent* are used in connection with the term *suspect* in the current thesis merely to inform the reader about the veracity status of the participants.

Deception

The chosen definition of the term *deception* is provided by Vrij (2008). He defines deception as "a successful or unsuccessful deliberate attempt, without forewarning, to create in another a belief which the communicator considers to be untrue" (p. 15). This definition covers two important features of deception in a legal setting. The first one is that deception is an act involving at least two people, which means that self-deception is excluded from this definition. The second feature is the intentionality, meaning that a person purposely presents false information to another person. Thus, presenting false information by mistake (i.e., to misremember) is not included in the definition (Vrij, 2008).

There are different categorizations of lies. DePaulo, Kashy, Kirkendol, Wyer, and Epstein (1996) state, for example, that there are three different kinds of lies to distinguish between – *outright lies, exaggerations*, and *subtle lies*. In outright lies the information conveyed is completely different from

what the liar thinks to be true. Exaggerations are lies that arise by over- or understating the facts. Subtle lies contain literal truths that aim however to mislead people. Not volunteering relevant information (concealment) is thereby an example of a subtle lie. Of these three kinds of lies, outright lies are found to be the most common (DePaulo et al., 1996; Vrij, 2008).

There are many ways of studying the detection of deception in forensic contexts, for example psycho-physiological deception detection (Honts, 2004); statement reliability evaluation techniques, such as Reality Monitoring (Sporer, 2004) and Statement Validity Analysis (Köhnken, 2004). The current thesis focuses on cues to deception that were elicited during the interaction between a sender (a person who is either lying or telling the truth) and a receiver (a person who is trying to detect deception or truth).

True and False Intentions

As previously mentioned, virtually all deception research concerns past actions. However, many real-life cases demonstrate the importance of learning more about how to correctly assess whether a person is lying or telling the truth about their intentions (e.g., the *9/11-attack* (Wright, 2006) and the *Liquid bomb plot* (Casciani, 2009)). In addition, Granhag (2010a) stressed the major societal value of increased knowledge on how to interrupt illegal actions that are planned but not yet committed.

Intention is defined as a person's mental state preceding a corresponding action (Malle, Moses, & Baldwin, 2001). For reasons of clarity, it is important to distinguish intention from concepts that are frequently wrongfully equated with this term. One such concept is *intentionality,* which refers to the quality of action (i.e., is an action purposeful). Other components of the definition of intention are that it is directed at the intender's own action, usually comes with a strong commitment to perform the intended action and that it is often based on some amount of planning (Granhag, 2010a). These qualities distinguish intention from the concept of *desire*, which is usually neither directed at the person's own actions nor comes with a strong commitment. In addition, many desires lack any planning.

Suspects' Counter-Interrogation Strategies

Counter-interrogation strategies are attempts made by suspects to successfully withstand an interrogation or an investigative interview and to appear convincing. Previous research has shown that liars may attempt to control their behavior when they realize that they are being observed by someone who intends to assess their veracity (e.g., Burgoon, Buller, Floyd, &

Grandpre, 1996; Burgoon, Buller, White, Afifi, & Buslig, 1999). The few existing studies on suspects' verbal counter-interrogation strategies are mostly experimental studies which use suspects' self-reports in order to obtain information about their strategies (e.g., Granhag & Strömwall, 2002; Kassin & Norwick, 2004; Strömwall, Hartwig, & Granhag, 2006). A study by Gozna, Sully, and Teicher (2005) is an exception; it examines suspects' counter-interrogation strategies during police interviews in the field. Caso, Vrij, Mann, and De Leo (2006) investigated the impact of informing participants about verbal and nonverbal cues to deception (used in the Criteria Based Content Analysis) on their verbal and nonverbal responses. The results show that the participants were able to alter their verbal, but not their nonverbal behavior. In this thesis I will examine suspects' counter-interrogation strategies during interviews on their past actions and on their future actions (intentions).

Research on Deception Detection

People's Ability to Discriminate between Truths and Lies

Lay people usually only perform around or slightly better than chance when they attempt to distinguish between truths and lies told by strangers (Vrij, 2008). An early review of deception detection studies by Kraut (1980) showed accuracy rates ranging from 45% to 60% (average 57%). A more recent meta-analysis by Bond and DePaulo (2006) examined the results of 206 studies and found that when people attempted to discriminate lies from truths in real time with no special aids or training, they achieved an average of 54% correct judgments. Vrij (2008) made a qualitative overview of 79 published studies in English after 1980 where lay people's ability to discriminate between truths and lies told by strangers was examined. The lowest reported accuracy rate was 31% (Brandt, Miller, & Hocking, 1982) and the highest was 68% (Wan Cheng & Broadhurst, 2005). The vast majority of studies reported accuracy rates between 50% and 60%, with an average accuracy rate of 54.27%. In studies in which a distinction between truth accuracy (correct classifications of truths) and lie accuracy (correct classification of lies) had been made, truth accuracy rates ranged from 49% to 81%. The average truth accuracy rate was 63.41%, which is above change level. In contrast, lie accuracy rates ranged between 27% and 70%. The average lie accuracy rate was 48.15%, which is below what would be expected by chance (Vrij, 2008).

The commonly observed fact that truth accuracy rates are higher than lie accuracy rates is, at least in part, the result of the so-called *truth bias* (the tendency of receivers to judge messages as truthful rather than deceptive) (e.g., Zuckerman, DePaulo, & Rosenthal, 1981). One explanation of this phenomenon is that people are more often confronted with truthful statements than with deceptive ones in their everyday lives, and are therefore predisposed to assume that a statement is truthful (the *availability heuristic*, O'Sullivan, Ekman, & Friesen, 1988).

The meta-analysis conducted by Bond and DePaulo (2006) showed that receivers' deception detection accuracy is influenced by a number of factors. The *deception medium* is one of these factors. Receivers can be exposed to senders who are only visible (video medium), only audible (audio medium) or audible and visible (audiovisual medium). The results show that receivers, who could only hear the sender, performed as well as receivers who could both hear and see the sender. However, receivers who could only see the sender performed worse than the receivers who could only hear or hear and see the sender.

Preparation of the sender is also a factor influencing deception detection accuracy. Receivers tend to achieve higher deception detection accuracy when judging senders' unprepared rather than prepared messages (Bond & DePaulo, 2006).

Yet another determining factor is *baseline exposure to the sender*. Receivers who are familiar with the senders' truthful nonverbal behavior and speech may be able to spot changes in the sender that indicate a lie. This reference point will make the assessment of veracity easier and somewhat more accurate (Bond & DePaulo, 2006).

Research conducted on the impact of the *motivation of the sender* shows somewhat conflicting results. Bond and DePaulo (2006) found in their meta-analysis that lies were easier to discriminate when they were told by motivated rather than unmotivated senders for within-studies comparisons. Between-studies comparisons of motivation showed no such difference. The latter result is in line with a more recent meta-analysis conducted by Hartwig and Bond (2013). The authors examined, among other things, deception detectability as a function of motivation and found that lies from unmotivated and motivated senders were equally detectable between studies.

Conflicting results are also found for the factor *age of the sender* (child vs. adult) on receivers' deception detection performance. For example, Edelstein, Luten, Ekman, and Goodman (2006) found that adult receivers detected children's (five to seven years old) lies more accurately than the lies of adults. In contrast, Vrij, Akehurst, Brown, and Mann (2006) found no

differences in accuracy between adults who were asked to detect truths and lies in children (five to six years old) and adults.

Study I examined the deception detection performance of receivers who assessed the veracity of unfamiliar older children (12-14 years old) that they could hear and see. At this point I want to clarify that the term *deception detection accuracy* is in the current thesis equated with the combined accuracy of truthful and deceptive statements.

Reasons for Receivers' Low Accuracy Rates

In the scientific literature, two major explanations have been proposed for why receivers achieve such low accuracy rates. The first explanation states that receivers have false beliefs about cues to deception. Hence, there is a discrepancy between their subjective cues to deception (beliefs people have about cues to deception) and the objective cues to deception (liars' actual behavior and speech) (for a more detailed account, see Vrij, 2008). Training the receivers (e.g., teaching them about the objective cues to deception) would be adequate from this standpoint. Research shows however mixed results for the efficacy of training on people's ability to correctly distinguish between truth tellers and liars. Akehurst, Bull, Vrij, and Köhnken (2004) and Bull (2004) came to the conclusion that training has no (or at most a small) effect on people's deception detection accuracy. Other researchers found a significant but modest effect of training (for a more detailed account, see Frank & Feeley, 2003; Levine, Feeley, McCornack, Hughes, & Harms, 2005; Vrij, 2008). In a recent meta-analysis on the efficacy of training Driskell (2012) observed a medium-sized positive effect of training (d = .50) and concludes that this indicates that it is possible to enhance accuracy by training. However, one should be cautious in interpreting this finding. Considering the fact that untrained receivers usually perform only just above chance level (Bond & DePaulo, 2006), a medium-sized increase in that level is not too impressive. Beyond that, Driskell (2012) states that effective training should use reliable indicators of deception. This is however problematic, as research has repeatedly shown that objective cues to deception are scarce, and that the predictive value of behaviors that have at least some relation to deception is very low (e.g., DePaulo et al., 2003; Vrij, 2008).

The second explanation attributes people's around chance accuracy levels to the scarcity and unreliability of cues. A meta-analysis by Hartwig and Bond (2011) supports this assumption. With the help of Brunswik's lens model (Brunswik, 1952) they demonstrate that receivers' poor performance is caused by the low validity of objective cues to deception, rather than

improper cue reliance. If this explanation holds true, a possible course of action is to develop and apply techniques that increase differences between truth tellers and liars and thus help receivers to make more correct veracity judgments. These techniques can be best applied during the questioning phase with a suspect. In the following section, I give an overview of different interview approaches which are used to detect deception.

Interviewing to Detect Deception

As outlined in the introduction of this thesis, the interview with a suspect is a crucial stage in the investigative process. Therefore it is not only important to obtain crime-relevant information from a person who is expected to be linked with the crime in question (Memon et al., 2003), but also to ensure that this information is as correct as possible. In connection to this, an unfortunately high number of real-life examples of poorly executed police interviews (for a more detailed account, see Gudjonsson, 2003) demonstrate the necessity of developing new and better interview techniques. Before giving an overview of the efforts made by researchers to generate new interview techniques to detect deception, I first want to take a brief look back at the developments in the field of interviewing to detect deception.

Developments in the Field of Interviewing to Detect Deception

Until the mid-90s the police commonly applied a confrontational/accusatory approach when interviewing suspects. This approach triggered rather short statements of denial in the suspects (Vrij, Granhag, & Porter, 2010) and could be found both in American and European police interviewing practice (e.g., Irving, 1980; Leo, 1996).

The Reid Technique. In their book *Criminal Interrogation and Confessions,* Inbau, Reid, Buckley, and Jayne (2011) describe an approach to interrogate suspects. I will refer to this approach henceforth as the "Reid Technique". The Reid Technique consists of two phases: the *Behavior Analysis Interview* (BAI) and the nine-step interrogation.

In order to determine whether a suspect is guilty or not and consequently needs to be interrogated further, the authors propose the BAI which is used in a pre-interview setting to detect deception in suspects and is claimed to be non-accusatory. During the interview, the suspects are asked open-ended questions, which invite them to talk freely. These questions are followed by a series of 15 standardized behavior-provoking questions which are thought to evoke different verbal and nonverbal responses in liars and truth tellers (e.g.,

liars will cross their legs and shift about in their chairs, liars are thought to be less helpful in the interview, more evasive about the purpose of the interview and less immediate in their denial of having committed the crime) (Vrij, 2008). The BAI protocol has been tested in several laboratory and some field studies. Vrij, Mann, Kristen, and Fisher (2007) found that people's ability to indicate whether suspects were deceptive or truthful was not increased by the BAI. Studies that tested the assumptions made by Inbau and colleagues on behavioral differences between truth tellers and liars proved many of these differences to be incorrect (Masip & Herrero, 2013; Vrij, 2005; Vrij, Mann, & Fisher, 2006). Furthermore, Masip, Barba, and Herrero (2012) and Masip, Herrero, Garrido, and Barba (2011) showed that the BAI indicators of truth and deception merely reflect shared commonsense beliefs.

If the guilt of a suspect cannot be ruled out, a nine-step interrogation should be employed. During this procedure the benefits of providing a confession are highlighted (Gudjonsson, 2003). The Reid Technique has been criticized by numerous researchers. Some points of criticism are that the technique is not based on any kind of empirical foundation and that many of the claims made are not supported by scientific findings. When comparing the predictions of the Reid model with the findings of the most complete meta-analysis of cues to deception to date by DePaulo and colleagues (2003), one sees that most predictions are not supported by DePaulo's findings. In addition, the Reid model is a very manipulative technique (e.g., the use of fake evidence is suggested) and Russano, Meissner, Narchet, and Kassin (2005) found that some of the methods proposed in the manual (e.g., maximization and minimization) increase not only the rate of true but also of false confessions.

Towards an information-gathering approach. In 1984, the Police and Criminal Evidence Act (PACE) was introduced in the UK (Home Office, 1985), which caused a decline in the use of manipulative and coercive interview techniques in the UK (e.g., Gudjonsson, 2003; Irving & McKenzie, 1989; Pearse & Gudjonsson, 1996). Although the accusatory approach is still used, an "inquisitorial approach" is now more commonly applied (Kassin, Appleby, & Torkildson Perillo, 2010) that uses tactics in line with the information-gathering approach (Moston & Engelberg, 1993; Soukara, Bull, Vrij, Turner, & Cherryman, 2009). In an information-gathering approach, the interviewer asks the suspect to give a detailed statement about their activities through open statements. Research has shown that false confessions are less likely to occur during information-gathering interviews (e.g., Meissner, Redlich, Bhatt, & Brandon, 2012; Rigoni & Meissner, 2008) and at the same time longer statements are generated by the suspects that contain, due to their

length, more cues to deception (e.g., Vrij, Mann, et al., 2006). However, as previously mentioned, research indicates that people are not very skilled in distinguishing between truthful and deceptive statements (Bond & DePaulo, 2006) and simple information-gathering interview approaches are not enough when trying to increase accuracy (Granhag & Vrij, 2010). In the majority of these studies receivers had to assess the veracity of unfamiliar mock suspects (of which 50% were truthful and 50% were deceptive) by passively watching or listening to taped interviews, without having any background information (e.g., about the suspects, the suspects' statements or the evidence) (Vrij, 2008).

During the last years a shift has occurred from these rather passive deception detection studies and studies examining the characteristics and effects of inappropriate and unethical interview techniques towards research on identifying the most effective ways of interviewing suspects (Granhag & Vrij, 2010). Although there is often at least some kind of incriminating information (evidence) against the suspect, most of these approaches do not take this evidence into account. In the following, I give an overview of these different non-evidence-related approaches, followed by approaches that take the evidence into account. This outline serves as a basis for the subsequent evaluation of similarities and differences between the non-evidence- and the evidence-related approaches.

Non-Evidence-Related Approaches

Assessment Criteria Indicative of Deception. Assessment Criteria Indicative of Deception (ACID) is an interviewing and assessment procedure that combines interviewing to detect deception with empirically-derived content criteria that highlight differences in truth tellers' and liars' verbal accounts (Suckle-Nelson et al., 2010). The investigative interview chosen for this procedure is the Reality Interview (RI), which is derived from the Cognitive Interview (CI) (Fisher & Geiselman, 1992; Geiselman, Fisher, MacKinnon, & Holland, 1985) and attempts to increase the level of difficulty for liars, while assisting truth tellers in retrieving information from their memory (Colwell, Hiscock, & Memon, 2002). The RI is specifically structured to highlight attempts at impression management and to increase the amount of cognitive load that liars experience. The reasoning behind this procedure is in line with the cognitive load approach, which states that lying is often more cognitively demanding than truth-telling and that liars try to reduce cognitive load by preparing their statements (e.g., Hartwig, Granhag, & Strömwall, 2007; Vrij, Fisher, Mann, & Leal, 2008). In order to give a consistent and believable statement, liars are likely to create and practice a

"lie script", which is usually relatively short when presented in an investigative interview (Colwell et al., 2002). These rigid "lie scripts" are likely to differ from the statements of truth tellers who aim at recalling the original event. The reasoning behind this is that the mnemonic portions of the interview lead to longer and more detailed statements by truth tellers, but not liars. The dependent measures for the ACID system are length of responses, amount of details, coherence, type-token ratio (i.e., the ratio of unique words in a statement to the total number of words in a statement), and admitting potential errors. The ACID studies, published so far, demonstrate that honest statements are longer and include more details than deceptive statements. These differences are more apparent during the mnemonic portion of the RI (e.g., Colwell, Hiscock-Anisman, Memon, Taylor, & Prewett, 2007). Besides replicating previous findings, more recent ACID studies add to the knowledge on the approach by taking additional variables into account. Studies examined, for example, the coherence of statements and gender differences (Suckle-Nelson et al., 2010) and the impact of adding affective details (the emotional state of the interviewee during the time of the target event) to the ACID method (Ansarra et al., 2011). Colwell et al. (2009) tested and found that basic training of the raters in the statement analysis portion of the ACID technique significantly increased their ability to assess the credibility of transcribed interviews.

The Cognitive Interview for Suspects. The Cognitive Interview (CI) is a combination of different scientifically-based techniques that aim to enhance cooperative witnesses' and victims' memory in order to collect as much correct information as possible (Fisher & Geiselman, 1992). For the Cognitive Interview for Suspects (CIS) the general CI protocol was combined with reliable findings from the literature on deception detection. Similar to the traditional CI, the suspect is encouraged to generate large amounts of information before being questioned further. Beyond that, the CIS makes use of two techniques that are associated with the unanticipated questions approach (for more information on this approach see section below) – to draw/sketch the story and to recall it in reverse order. The CIS consists of eight stages: (1) Building rapport/introduction, (2) Asking for a narrative, (3) Illustrating the story in a drawing/sketch, (4) Follow-up/open-ended questions, (5) Reverse-order procedure, (6) Challenge suspect with inconsistencies, incriminating statements, and/or external incriminating evidence, (7) Review of the interview together with the suspect, (8) Closure of the interview (Geiselman, 2012). The effect of the CIS on interviewers' deception detection accuracy was tested in a recent study by Geiselman (2012), who instructed the participants (interviewers) to make a judgment of

suspects at the first six stages of the interview. The results showed that after the narrative stage the accuracy rates were just above chance level (in line with previous research findings), however the remaining stages of the CIS resulted in a systematic increase in interviewers' ability to discriminate true from false stories. Most of the tactics employed in the CIS have been previously studied in isolation; this was the first study that combined them into a comprehensive set of procedures.

Levine's strategic questioning approach. In 2010, Levine presented the hypothesis that the constantly observed slightly above chance level accuracy rates in the deception detection literature can be explained by the presence of a few transparent liars (Levine, 2010). He stated that people usually leak no cues to deception and those who do, are the exception. As an example he showed that the constantly reported accuracy rates of around 55% are obtained when only around 10% of the people leak cues to deception. Based on this idea he and his colleagues suggested an approach that aims to enhance accuracy by increasing variance in sender transparency with the help of strategic questioning during the investigative interview (Levine, Shaw, & Shulman, 2010). This line of research belongs to the *question effect research* which states that how a potentially deceptive person is questioned may impact veracity judgments and accuracy levels of the receiver (Levine, Blair, & Clare, 2013). The authors state that some of the strategic questions applied in their approach were influenced by the Behavior Analysis Interview (BAI). However, for some other questions included in the question set, it remains unclear where they originate from. The questions asked in this approach changed over time, as the authors in a stepwise procedure tested which combination of questions resulted in the highest accuracy rates. However, the accuracy rates of the previous sets of questions never exceeded 70% (e.g., Levine, Kim, & Blair, 2010; Levine, Shaw, et al., 2010). In a recent study Levine et al. (2013) tested the latest set of questions in a similar setting as the previous studies. In their experiment, undergraduate students played a trivia game for a cash prize with a partner, who was a confederate. All participants were provided with the opportunity to cheat and were encouraged by the confederate to do so. After the completion of the trivia game, the participants were asked a set of questions (for the exact questions, see Levine et al., 2013). These interviews were videotaped and played to different groups of receivers (two student samples, one expert sample). The obtained veracity rates from the three groups of receivers ranged from 71% to 78%.

Imposing-cognitive-load approach. The imposing-cognitive-load approach (Vrij, Fisher, Mann, & Leal, 2006, 2008, 2009) is based on the assumption that lying can sometimes be more cognitively demanding than

telling the truth. To better understand this assumption one needs to look at the different challenges liars and truth tellers face during an investigative interview. Literature on *communication grounding* (e.g., Clark & Brennan, 1991) shows that a conversation can only be successful when the persons involved are able to establish and constantly update their common ground (i.e., their mutual knowledge, mutual beliefs, and mutual assumptions) (Clark, 2001). The listener needs to signal to the speaker that they have understood what was said and the speaker needs to be aware of the signals sent by the listener. Only if this process is successful, will information enter the common ground. Translated to an investigative interview this means that truth tellers and liars face similar challenges, as both need to keep an eye on the reactions of the interviewer and, if necessary, try to increase the quality of their statements. However, during the interview truth tellers can freely and truthfully report from their memory. In contrast, liars cannot communicate to the interviewer what they know; instead they need to invent a story that is consistent and reasonable. In addition, they need to present it to the interviewer in a trustworthy way, in spite of knowing that it is a lie. All of these additional challenges, liars face during an interview, lead to the assumption that lying is (for the most) more cognitively demanding than truth telling (e.g., Vrij, Fisher, et al., 2008). An interviewer, when imposing additional cognitive demand on the interviewee (for example by introducing mentally taxing interventions), can increase the differences between truth tellers and liars (Vrij, Fisher, et al., 2009). Possible ways of doing so are, for example, asking the interviewees to give their statements in reverse order, asking the suspects to maintain eye contact with the interviewer or to require that the interviewees complete additional tasks. Research conducted on these interventions shows that in the higher cognitive load conditions, more cues to deception emerged and receivers who watched the interviews could distinguish better between truthful and deceptive statements in these high (vs. low) cognitive load conditions (e.g., Vrij, Mann, et al., 2008; Vrij, Mann, Leal, & Fisher, 2010).

The unanticipated questions approach. When suspects are interviewed on their past as well as their future actions, the unanticipated questions approach can be applied (Vrij, Leal, et al., 2009). This approach is based on the finding that liars (vs. truth tellers) prepare themselves more for an upcoming interview (e.g., Hartwig et al., 2007; Hartwig, Granhag, Strömwall, & Doering, 2010) by, for example, trying to anticipate the questions they will be asked. For this preparation to pay off, liars need to correctly anticipate the questions they will be asked during the interview. If

they fail to anticipate the questions, the quality of their statements might be poor and their lies might be transparent.

The rationale behind the unanticipated questions approach is to ask unanticipated questions in order to make liars' preparation of less use (Vrij, Leal, et al., 2009). It is assumed that the unanticipated questions are equally unanticipated for truth tellers and liars. As a consequence of this, liars and truth tellers are assumed to perceive the unanticipated questions as more cognitively demanding compared to the anticipated questions. However, liars' cognitive demand is expected to be even higher compared to truth tellers', since the former can neither report from their memory nor make use of their pre-interview preparation. For the unanticipated questions, liars have to come up with an answer on the spot, which will increase their already high cognitive load (liars need to come up with a plausible, consistent lie and remember it during the interview). In contrast, truth tellers can fall back on their memory and can truthfully report what they did with less effort. Although searching the memory for relevant information can also be cognitively challenging, this task is expected to be less cognitively demanding than liars' task of making-up an answer on the spot (e.g., Vrij, Fisher, et al., 2008). To sum up, although the unanticipated questions will come as a surprise to both truth tellers and liars, answering these questions in a satisfying way will prove more difficult for liars than for truth tellers.

Different formats are possible when applying this approach. The interviewer could, for example, ask the suspect questions that are per se unanticipated. Research has shown that this is an effective method to discriminate between truthful and deceptive statements in individuals (Lancaster, Vrij, Hope, & Waller, 2013; Warmelink, Vrij, Mann, Jundi, & Granhag, 2012) and in pairs of liars and truth tellers (Vrij, Leal, et al., 2009). In the latter study, pairs of liars and truth tellers were interviewed individually about having lunch together at a restaurant. The truth tellers did have lunch together, the liars were asked to construct a "joint lunch" alibi (masking an illegal action they committed). After the participants had the opportunity to prepare their statements, they were interviewed and asked anticipated opening questions, as well as unanticipated temporal ("Who finished their food first, you or your friend?") and spatial questions ("In relation to the front door and where you sat, where were the closest diners?"). The unanticipated (vs. anticipated) questions resulted in lower degrees of correspondence in the answers of pairs of liars than of pairs of truth tellers. Another example of the efficacy of asking unanticipated questions is a study by Liu and colleagues (2010). They examined truth-telling and lying children's responses to unanticipated questions and found that truth-telling,

more than lying, children refused to answer these questions. However, there was no difference between truth-telling and lying children for the anticipated questions. Asking suspects during interviews on their intentions additional questions on their prior planning activities (unanticipated questions), has also proven to be effective when aiming to distinguish truthful from deceptive statements in individuals (Granhag, Sooniste, Strömwall, & Liu-Jönsson, 2012; Sooniste, Granhag, Knieps, & Vrij, in press) and small cells of suspects (Sooniste, Granhag, Strömwall, & Vrij 2013).

Another way of applying the unanticipated questions approach is to ask the suspects to use an unanticipated response format. In the previously mentioned study by Vrij, Leal, and colleagues (2009), when suspects were asked to draw the layout of the restaurant, the authors found that liars' drawings corresponded significantly less with each other than truth tellers' drawings (see Leins, Fisher, Vrij, Leal, & Mann, 2011; Vrij, Leal, et al., 2010 for similar findings). In a recent study by Roos af Hjelmsäter, Öhman, Granhag, and Vrij (2013) triads of suspects were asked for a spatial description of an experienced (truth tellers) or imagined (liars) event by marking aspects of that event on a sketch (unanticipated task). It was found that liars' (vs. truth tellers') spatial descriptions were significantly less consistent. Recent studies by Vrij, Leal, and colleagues (2010) and Vrij, Mann, Leal, and Fisher (2012) showed that more differences between truth tellers and liars were observed when matching their drawings compared to matching their verbal recall. This implicates that asking suspects for drawings might have a higher potential to elicit cues to deception than asking them for a verbal account.

The devil's advocate approach. To examine whether expressed opinions include deception or not, the devil's advocate approach was developed. The idea behind this approach is that people usually think more deeply about reasons that support (vs. oppose) their beliefs (Vrij, Granhag, et al., 2010; Vrij, Granhag, Mann, & Leal, 2011a). Leal, Vrij, Mann, and Fisher (2010) tested the approach by firstly asking truth tellers and liars an opinion-eliciting question (participants had to argue in favour of their personal view) and subsequently a devil's advocate question (participants had to argue against their personal view). The results showed that truth tellers' statements that supported their personal view (opinion-eliciting question) were longer than their statements that went against their personal view (devil's advocate question). In contrast, liars' statements on the opinion-eliciting question were shorter than their statements on the devil's advocate question; however this difference was not significant.

Evidence-Related Approaches

Most previous research has neglected situations in which evidence was available, although in many real-life situations the interviewer has some sort of evidence against the suspects (e.g., Wagenaar et al., 1993). Multiple studies have shown that when there is evidence against suspects, this evidence is almost always disclosed to them (Bull & Soukara, 2010, Study 4; King & Snook, 2009; Leo, 1996; Pearse & Gudjonsson, 1996; Soukara et al., 2009).

When using evidence in an interview, the timing of the evidence disclosure is an important factor to consider. Many police interviewing manuals recommend early disclosure (e.g., Inbau et al., 2011). This recommendation lacks however theoretical and empirical support. It is unclear how closely practitioners follow these recommendations, since the meager research conducted on real-life police interviewing practice shows mixed results. In a study conducted on a US sample Leo (1996) found that 80% of the interviewers disclosed the evidence against the suspect at the beginning of the interview. In contrast, a study by Bull and Soukara (2010) on a British sample showed that evidence disclosure in the first five minutes of the interview occurred in 37% of the cases. Moston and Engelberg (1993) found that early evidence disclosure is not the main strategy used by interviewers and can be seen instead as one among many strategies.

The Strategic Use of Evidence technique. The SUE-technique is, as previously mentioned, an evidence-related approach that aims to actively elicit diagnostic cues to deception and truth (e.g., higher degrees of inconsistency with the evidence in the statements of liars compared to truth tellers) by interviewing suspects in a strategic manner. The SUE-technique is theoretically founded and rests upon psychological notions from three domains: (1) The psychology of instrumental mind-reading, (2) The psychology of self-regulation, (3) The psychology of guilt and innocence (see Granhag & Hartwig, 2008 for a more detailed description). Empirical research has proven the technique's potential to elicit diagnostic cues to truth and deception in suspects' statements (e.g., Hartwig et al., 2005, 2011; Hartwig, Granhag, Strömwall, & Kronkvist, 2006). Receivers can subsequently use these cues to assess suspects' veracity (see more detailed information on the SUE-technique on page 33). Dando and Bull (2011) recently presented an approach that, as the authors state, is applicable when a larger quantity of evidence is available. In these cases, the evidence should be presented gradually (one piece at a time) to the suspect and not in a bulk. Dando and Bull's study showed that the gradual disclosure resulted in higher

accuracy rates than both the late "in a bulk" disclosure and the early disclosure.

Tests to examine claims of crime-related amnesia. After having committed a crime, suspects frequently claim to be unable to remember anything from the period when the crime occurred (i.e., crime-related amnesia) (Jelicic & Merckelbach, 2007). This claim, if incorrect, is a form of deception. Different methods exist that aim at assessing whether such a claim made by a suspect is authentic or not. First, there are self-report questionnaires, for example, the *Structured Inventory of Malingered Symptomatology* (SIMS) (Smith, 1997; Smith & Burger, 1997), that is designed to assess a person's tendency to malinger (i.e., to pretend or exaggerate incapacity or illness; for a more detailed description of the SIMS see Christianson & Merckelbach, 2004; Jelicic & Merckelbach, 2007). Second, there is the *Guilty Knowledge Test* (GKT) (e.g., Lykken, 1959, 1960), which is a technique that aims at detecting whether a claim of not possessing certain knowledge is correct or not (Jelicic & Merckelbach, 2007). The test consists of a number of questions with five answer alternatives each, of which one answer is correct. Physiological responses of the suspect (e.g., electrodermal activity) are measured and if a suspect is in possession of the correct information (i.e., crime-related knowledge), they should react with heightened electrodermal responses to the correct alternatives (Jelicic & Merckelbach, 2007). *Symptom Validity Testing* (SVT) (e.g., Binder & Pankratz, 1987; Denney, 1996; Pankratz, 1983) is a third method to detect malingering. During the test the suspect is presented with a list of crime-related questions. Two answers are presented for each question, of which one is correct and the other is incorrect. Genuine memory loss about the crime in question should result in a random performance pattern on the SVT: approximately half of the questions should be answered correctly and the other half incorrectly. People who perform significantly below chance are therefore suspected of deliberately avoiding the correct answers and, hence, to malinger (Jelicic & Merckelbach, 2007).

The latter two methods use the available evidence when trying to detect deception (more specifically, malingering). As the GKT aims at generating physiological responses, for which specialized equipment is required for analysis, it will not be included in the current overview of interview approaches to detect deception. In contrast, the SVT uses the answers given by the suspects to obtain an indication of whether the person is deceptive or truthful and therefore could have been included in this review as an evidence-related interview approach to detect deception. However, I chose not to include this method in the current overview as it is (apart from a few

exceptions) exclusively used to detect deception about memory loss, and is not used in cases in which the guilt or innocence of a person is to be established.

The fact that experimental research has started to take evidence into account is a crucial development, since evidence is highly relevant in real-life police investigative interviews. Not only is available evidence almost always used in real-life cases (e.g., Bull & Soukara, 2010), Gudjonsson and Petursson (1991) also showed in a field study that strong evidence is the most common reason for confessing to a crime. Kebbell, Hurren, and Roberts (2006) replicated this finding using an experimental setup. In an experimental study by Sellers and Kebbell (2009) it was shown that not only the strength of the evidence affects the confession rate, but also the timing of the evidence disclosure (early vs. late during the interview). When evidence was strong and disclosed late to the mock suspects, higher confession rates were produced than when it was disclosed early or was weak. However, when weak evidence was disclosed late during the interview, the mock suspects tended to withdraw their previously made confessions. The present thesis adds to the new wave of evidence-related approaches.

Comparison of the Interview Approaches

In the following, I compare the previously introduced interview approaches on the following dimensions: (1) Use of evidence (yes vs. no), (2) Emotion-based vs. cognitive-based approaches, (3) Focus on accuracy rates or elicitation of cues to deception, (4) Theoretical justification of the approaches (yes vs. no), (5) Specific predictions about cues to deception (yes vs. no), (6) Judicial relevance of the elicited cues (refers to whether the approaches take the judicial challenges into account and whether the elicited cues to deception merely have investigative value), and (7) Number of published studies on the approaches.

Whether or not the approaches take evidence into account (Dimension 1) is considered to be of importance since, as mentioned at the outset of this thesis, there is often some kind of evidence (critical background information) against the suspect (e.g., Wagenaar et al., 1993) and this information is almost always disclosed (partly or in full) to the suspect (e.g., King & Snook, 2009; Pearse & Gudjonsson, 1996; Soukara et al., 2009).

Dimension 2 explores whether the approaches are emotion-based or cognitive-based. Emotion-based interview protocols are based on the premise that liars and truth tellers differ in their experienced emotions during an

investigative interview. For example, liars are expected to be more anxious, more nervous and/or more concerned than truth tellers (e.g., Vrij & Granhag, 2007). However, emotion-based approaches have limitations, for example, the fact that the predicted emotions are not exclusively displayed by liars. Truth tellers may very well experience anxiety, nervousness and concern during an interview. Up to date, no interview technique exists that enhances the emotional cues more in liars than in truth tellers (National Research Council, 2003). In contrast, the cognitive-based approaches state that lying is cognitively more taxing than telling the truth. Although, cues of cognitive load can be elicited from liars as well as truth tellers, interview techniques exist that elicit and enhance cues of cognitive load to a greater extent in liars than in truth tellers. Therefore, cognitive- (vs. emotion-) based approaches can be seen as the more promising interview approaches to distinguish accurately between truth tellers and liars.

In a recent paper Vrij and Granhag (2012a) recommended that future deception research should aim to actively elicit cues to deception. They state that moving away from being merely outcome-oriented (i.e., focusing on accuracy rates) towards understanding the processes that explain the outcome (e.g., how and why cues to deception are elicited), can help to develop new and refine the old interview techniques (Dimension 3).

Whether an approach is theoretically justified (Dimension 4) is an important indicator of quality. When approaches do not have a theoretical basis, they cannot be perceived as solid. An additional indicator of quality is therefore whether or not an approach makes specific predictions about which cues to deception it aims to elicit (Dimension 5).

In their paper Vrij and Granhag (2012a, p. 115) wrote: "For deception research to really make a difference, researchers must provide criminal investigators with techniques that will help them to produce evidence that will stand up in court. It is not just about assessing whether a suspect is lying or telling the truth, it is also about maximizing the value of the evidence so that prosecutors can present it 'beyond reasonable doubt', the standard of proof typically required in criminal courts. In essence, it is time to try filling the gap between traditional deception research and judicial decision making.". Based on this recommendation, the approaches introduced in the current thesis will also be compared with respect to the judicial relevance of the cues they aim to elicit (Dimension 6).

The number of published studies on an approach (Dimension 7) is an additional important indicator of quality. Publications in peer-reviewed journals that demonstrate the efficacy of an approach are necessary for any approach to be considered sound.

Dimension 1: Use of Evidence

Very few of the interview approaches introduced above take the evidence against the suspect into account. Only the SUE-technique and its variant – the gradual disclosure of information approach – consider the available evidence. The latest work on the SUE-technique in particular demonstrates researchers' understanding of the importance of not only disclosing evidence strategically in interviews, but also of exploring more effective and advanced ways to do so (Granhag, 2010b; Granhag, Rangmar, & Strömwall, 2013; Granhag, Strömwall, Willén, & Hartwig, 2013; Luke, Hartwig, et al., 2013).

Dimension 2: Emotion-Based vs. Cognitive-Based Approaches

The Behavior Analysis Interview (BAI) belongs to the emotion-based approaches, as it assumes that there will be emotional differences between truth tellers and liars during an interview. Two of the underlying assumptions of the BAI are that liars will feel less comfortable than truth tellers and have different attitudes towards the investigation (Inbau et al., 2011).

In contrast, the imposing-cognitive-load approach, the unanticipated questions approach, the devil's advocate approach and the SUE-technique are cognitive approaches. Empirical research conducted on the efficacy of these approaches (in terms of eliciting reliable cues to deception and truth) shows promising results (e.g., Hartwig et al., 2005; Leins et al., 2011; Liu et al., 2010). An argument against emotion-based approaches is the fact that liars, like most people, are likely to believe that signs of certain emotions, for example increased arousal, might increase suspicion in an interview (Strömwall, Granhag, & Hartwig, 2004) and will therefore attempt to avoid these (Strömwall et al., 2006). If this attempt is successful, emotion-based approaches will be ineffective. In contrast, cognitive-based approaches assume differences between truth tellers and liars (e.g., higher cognitive load for liars) which cannot be leveled out as easily by liars.

Levine and his colleagues state that some of the questions included in their strategic questioning approach were inspired by the BAI (emotion-based approach). However, some of the other questions are clearly cognitive-based (e.g., "For the answers you got right, explain how you know the right answer."). Therefore, I consider this approach a mix of emotion-based and cognitive-based.

Dimension 3: Focus on Accuracy Rates or Elicitation of Cues to Deception

For two of the introduced approaches the authors merely report accuracy rates. Levine and colleagues claim that their strategic questioning approach

aims at increasing sender transparency, but the authors do not focus on or discuss any elicited cues to deception. The same holds true for the gradual disclosure of information approach by Dando and Bull (2011).

One example of an approach that focuses on the accuracy rates, as well as potentially emerging cues, is the ACID method. Cues that are expected to emerge are related to the quality of the suspects' statements, such as statement length, vividness, richness, and uniqueness of details. The CIS also reaches beyond the accuracy rates and examines potential cues to deception. These are, for example, statement length and the duration it takes for suspects to complete the drawing and the reverse-order tasks (Geiselman, 2012). Geiselman stresses however that these indicators should not be taken as sufficient evidence to conclude that an individual is being deceptive. They should merely provide the interviewer with "red flags" or "hot spots". The BAI also aims to elicit cues to deception. These cues are, for example, that liars will be less helpful than truth tellers and less immediate in their denial of having committed the crime (Vrij, 2008). Empirical research has however shown that many of the cues to deception predicted by the BAI are incorrect (e.g., Masip & Herrero, 2013; Vrij, 2005; Vrij, Mann, & Fisher, 2006).

A technique that not only attends to cues to deception and truth, but actually aims to elicit such cues actively, is the SUE-technique. When the evidence is disclosed strategically, the statements of liars (vs. truth tellers) are expected to include less pieces of possibly incriminating information in the free recall and to be less consistent with the possibly incriminating information.

The imposing-cognitive-load approach, the unanticipated questions approach, and the devil's advocate approach also aim to elicit cues to deception. The nature of these cues can be both verbal (e.g., speech hesitations, speech errors) and nonverbal (e.g., increase in leg/feet/hand/finger movements) (e.g., Vrij, Mann, et al., 2008; Vrij, Mann, Leal, & Fisher, 2010).

Dimension 4: Theoretical Justification of the Approaches

When referring to the theoretical justification of an approach, I will use the definition of *theory* provided by Wacker (1998, p. 363): "Theories carefully outline the precise definitions in a specific domain to explain why and how the relationships are logically tied so that the theory gives specific predictions." This definition is similar to many other definitions of *theory* as it covers three important features – a theory describes, explains and predicts.

As previously mentioned, the BAI is based on the assumption that liars are more anxious than truth tellers and will display more nervous behaviors.

This assumption is not based on sound theory and research has proven it to be incorrect (National Research Council, 2003; Vrij, Fisher, et al., 2008).

The questions applied in Levine's approach are inspired to some extent by the BAI (Levine et al., 2013) and other approaches that attach importance to the questions asked. However, the authors neither make it transparent where the remaining questions originate from, nor present the theoretical basis for why these specific questions were chosen. Beyond that, the eventual combination of the questions used in Levine's approach seems to have been guided by trial and error, rather than theoretical assumptions.

The Cognitive Interview for Suspects (CIS) has its origin in the CI, which is based on empirically and theoretically supported principles of memory and communication theory, as well as analyzes of law-enforcement interviews (Geiselman, 2012). The application of the CI to the field of deception detection is however rather new. The techniques used during the CIS are borrowed from other approaches within the field of deception detection, as they aim at increasing the cognitive load on the story tellers and eliminating the positive effects of planning for liars (Vrij, Leal, et al., 2009; Vrij, Mann, et al., 2008). A similar pattern can be found in the Assessment Criteria Indicative of Deception (ACID) approach, which uses the Reality Interview (a variation of the CI) as the investigative interview of choice (Suckle-Nelson et al., 2010). Additionally, it "combines content criteria derived from research in interpersonal deception and memory" as a statement analyzing tool (Colwell et al., 2007, p. 167). However, the actual combination of these content criteria with the interview method is not theory-based.

As previously mentioned, the SUE-technique has a strong theoretical basis, as it rests upon psychological notions from the psychology of instrumental mind-reading, the psychology of self-regulation, and the psychology of guilt and innocence (Granhag & Hartwig, 2008). According to the previously given definition of *theory*, the imposing-cognitive-load approach and the unanticipated questions approach are also theoretically founded. These approaches are based on the postulates that (i) lying (vs. truth-telling) is often cognitively more demanding (Vrij, Fisher, et al., 2006), that (ii) liars (vs. truth tellers) prepare themselves more when anticipating an interview and that (iii) liars (vs. truth tellers) depend more on their preparation when aiming to give a convincing statement (DePaulo et al., 2003; Hartwig et al., 2007). Many sources support these postulates (e.g., examinations of real-life police interviews, observations of mock suspects in experimental studies, self-reports of mock suspects in experimental studies) (see Vrij, Fisher, et al., 2006 for a more detailed account).

Dimension 5: Specific Predictions about Cues to Deception

The introduced interview techniques differ with respect to whether or not they make specific predictions about cues to deception and truth. Although, the CIS makes predictions about indicators of deception (e.g., few details in the story, contradictions, grooming, blinking and exaggerated movements), it is stressed that these should merely be seen as "red-flags", with limited diagnostic value. The different indicators mentioned by Geiselman (2012) are to be monitored throughout an investigative interview, but especially during stages where the cognitive load is expected to be highest for the suspect. The imposing-cognitive-load approach, the unanticipated questions approach and the devil's advocate approach include general ideas about cues to deception that are likely to be more pronounced in liars than in truth tellers (e.g., more speech hesitations, slower speech rate and a decrease in body movements). These cues are expected to emerge as a result of an increase in cognitive load. However, like the CIS, these approaches do not predict specific cues that will emerge, they instead list several potential cues to look out for (i.e., "red flags").

The ACID approach makes specific predictions about which cues will be more present in the statements of truth tellers than of liars (e.g., longer and more detailed statements, more words and details added during the mnemonics portion of the RI). Empirical research on the ACID approach supports these predictions (e.g., Ansarra et al., 2011). However, the predicted cues are cues to truthfulness rather than cues to deception. The absence of these specifically predicted cues might lower the perceived quality or credibility of a statement but will not, in all likelihood, create a sound basis to accuse an individual of lying**.**

The SUE-technique makes specific predictions about the cues that it aims to elicit. These are specific cues to either deception or truth in the statements of suspects. In the free recall phase of an interview, the technique will elicit more omissions of the possibly incriminating information in the statements of liars as a cue to deception (vs. less omissions of the possibly incriminating information in the statements of truth tellers as a cue to truthfulness). In the specific questions phase the technique will elicit a higher degree of statement-evidence inconsistency in the statements of liars as a cue to deception (vs. a lower degree of statement-evidence inconsistency in the statements of truth tellers as a cue to truthfulness). These cues to deception and truth are predicted on a theoretical basis and numerous empirical studies conducted on the SUE-technique have shown its efficacy to elicit these cues (e.g., Hartwig et al., 2005, 2006, 2011).

Dimension 6: Judicial Relevance of the Elicited Cues

The fact that some of the introduced approaches focus beyond the accuracy rates, by including the elicitation of cues to deception, is positive. However, not all elicited cues to deception can be considered as judicially relevant. Two cues to deception elicited by the imposing-cognitive-load approach can be used as an example: *slower speech rate* and *lower quantity of spatial details* (e.g., Vrij, Mann, et al., 2008; Vrij, Mann, Leal, & Fisher, 2010). That a suspect speaks slowly or that their statement includes fewer details about locations ("he stood next to the door") does not automatically indicate lying. In addition, one can speculate to what degree cues that merely relate to characteristics of the suspect's statement will be of help to the prosecutor when trying to construct a case that convinces a judge or jury of the suspect's guilt beyond a reasonable doubt. The cues to deception elicited when applying the CIS, the ACID approach, the unanticipated questions approach and the devil's advocate approach are, in this respect, similar to those elicited by the imposing-cognitive-load approach.

Cues that strengthen the available evidence will likely be of more relevance in court. Imagine the following: the police find the suspect's fingerprints on the murder weapon. When the suspect is informed about this evidence at the outset of the interview, they will be able to adjust their statement to the evidence and find an innocent explanation for it. In court, this evidence is subsequently of low value as it cannot be used by the prosecutor in their attempt to prove the suspect's guilt. However, when the SUE-technique is applied during the interview, the suspect will give a statement without knowing about the evidence the police possess. If the suspect clearly states to not have seen or touched any weapon, the statement then contradicts the physical evidence. Consequently, the only reasonable explanation for the fingerprints on the weapon would be that the suspect is lying. If the suspect would attempt to retroactively (after being informed about the evidence the police hold) make the statement fit with the evidence, the suspect's credibility would decrease. Having fingerprints on the murder weapon without a reasonable innocent explanation from the suspect regarding how these fingerprints got there, increases the value of this evidence in court as it helps the prosecutor on their mission to prove the guilt of a suspect beyond a reasonable doubt (Vrij & Granhag, 2012b).

In a recent study Kelly, Miller, Redlich, and Kleinman (2013) demarcate the terms "interrogation" and "deception detection" from each other. The authors state that an interrogation implies direct information gathering, whereas "deception detection does not directly speak to eliciting information" (Kelly et al., 2013, p. 3). It is correct that the typical deception

detection technique merely informs about whether a person is lying or telling the truth. However, the previous example illustrates that the SUE-technique does more than this, as it elicits cues to deception that can increase and optimize the value of the available evidence and thus results in information that can be of value in court (Granhag, Rangmar, et al., 2013).

Dimension 7: Number of Published Studies on the Approaches

Although some studies have been conducted on the use of the traditional CI to detect deception (e.g., Bembibre & Higueras, 2012; Hernández-Fernaud & Alonso-Quecuty, 1997), up to date only one study has been published evaluating the CIS as an investigative interview protocol (Geiselman, 2012). This study gives an idea of the capability the CIS has to detect deception. More studies have been published on Levine's strategic questioning approach, but so far they are still few and aim exclusively at refining the set of questions and not at testing and applying the final approach.

An example of an imbalance between how established and used a technique is and how much empirical research exists on it is the BAI and the nine-step procedure. Although both are taught to and have been used by the police for many years all over the world, reliable peer-reviewed studies that empirically validate the techniques are scarce (Vrij & Granhag, 2012b).

During the last decade 10+ empirical studies have been published on the SUE-technique. In these empirical studies, the SUE-technique was tested in a variety of settings (e.g., with single suspects, with multiple suspects, evidence disclosure in a stepwise manner) (e.g., Granhag, Rangmar, et al., 2013; Granhag, Strömwall, et al., 2013; Hartwig et al., 2005, 2006, 2011). Only one paper has been published on the gradual disclosure of information approach (Dando & Bull, 2011). Although the imposing-cognitive-load approach, the unanticipated questions approach and the devil's advocate approach are also relatively new in the field, several studies have been published in peer-reviewed international journals on these approaches (e.g., Vrij, Fisher, et al., 2006, 2008, 2009; Vrij, Mann, et al., 2008; Vrij, Mann, Leal, & Fisher, 2010). To the present day 10+ studies have been published that use all or part of the ACID system (Colwell, Hiscock-Anisman, & Fede, 2013).

Summary of the Comparison of the Interview Approaches

To sum up, the reviewed approaches differ rather drastically in quality and judicial relevance. Some of the approaches lack a theoretical basis (e.g., the BAI, Levine's strategic questioning approach), or merely focus on the obtained accuracy rates but not on possibly elicited cues to deception (e.g.,

Levine's strategic questioning approach). When approaches take cues to deception into account, either no specific predictions are made about which cues the approach aims to elicit (e.g., CIS, imposing-cognitive-load approach, unanticipated questions approach) or the judicial relevance of the elicited cues is probably low (this holds true for all the cue-eliciting techniques except for the SUE-technique). A conclusion that can be drawn is that the SUE-technique stands out as being the approach with the highest quality. The technique is based on sound theory and makes specific predictions about the cues to deception and truth it aims to elicit (e.g., the degree of statement-evidence inconsistency in suspects' statements). Multiple studies published in peer-reviewed journals have shown the efficacy of the SUE-technique in eliciting the predicted cues that are highly judicially relevant (i.e., helping the prosecutor to build a strong case).

Another option to assess the quality of an approach is to relate it to standards formulated by legal institutions (e.g., courts). In 1993, the United States Supreme Court decided on criteria required for admitting expert scientific evidence in the American federal courts (*Daubert vs. Merrell Dow Pharmaceuticals, Inc.,* 1993). The critical questions were (Huss, 2009, p.54-55): (1) Is the theory or technique at issue testable and has it been tested?, (2) Has the theory or technique been subjected to peer review or publication?, (3) What is the known or potential error rate for the scientific techniques?, (4) Is the theory generally accepted in the scientific community? When trying to answer these four questions in relation to the SUE-technique, the answer is yes for the first two questions. The SUE-technique is testable and has been tested in numerous experimental studies which have shown its efficacy (e.g., Hartwig et al., 2005, 2006, 2011; Sorochinski et al., 2013). These articles were all published in peer-reviewed journals. As the technique has not yet been tested in the field and no meta-analysis of the hitherto conducted experimental studies exists, the error rate across all studies of the SUE-technique is not yet known. Furthermore, as the SUE-technique is a rather new approach, there are still some researchers who express minor or major doubts regarding either the applicability of the technique or its efficacy (e.g., van Koppen, 2012). However, many other researchers perceive the SUE-technique as an efficient interview method to detect deception (e.g., Tedeschini, 2012; Vrij, 2008). Due to the strong theoretical foundation of the SUE-technique, its potential to actively elicit reliable cues to deception, and the number of peer-reviewed publications, the acceptance of the SUE-technique in the deception detection community is expected to grow further.

The fact that the SUE-technique meets many of the requirements formulated by the United States Supreme Court, and the results from the

previously made evaluation, show that it qualifies as an appropriate interview technique to detect deception (and truth). Beyond that, these findings are additional justifications for conducting research in order to further explore and improve the SUE-technique and to test its applicability in different settings, as done in the current thesis.

Theoretical Framework

The following section focuses on the challenges that truth-telling and lying suspects face before and during an interview and examines the strategies they use in order to appear truthful. This knowledge is paramount in order to understand how cues to deception and truth can be elicited during an interview.

The Psychology of Self-Regulation

A mutual goal of truth-telling and lying suspects is to be assessed as truthful deniers of guilt. In order to reach this goal, truth tellers as well as liars will try to control their behavior during the interview to make a truthful impression (DePaulo et al., 2003). Theories on self-regulation focus on processes aimed at controlling and directing people towards a goal and/or away from undesired outcomes or threats (Carver & Scheier, 2011; Fiske & Taylor, 2008). Psychological research shows that self-regulatory strategies are evoked by conditions of threat, especially if one has only little knowledge about the forthcoming aversive event (Fiske & Taylor, 2008). Transferred to an investigative context, the upcoming interview can be seen as a threat for the suspect, since the consequences of being assessed as deceptive may be fearsome (Granhag & Hartwig, 2008). Social cognition research suggests that a person may use different control strategies to restore the sensed loss of control (for a more detailed description of these different control strategies, see Fiske & Taylor, 2008). Granhag and Hartwig (2008) argue that two of these strategies – *decision control* and *information control* – are of particular relevance for an investigative interview. Decision control refers to the ability to make a decision regarding how to engage in an upcoming aversive event (Fiske & Taylor, 2008). Granhag and Hartwig (2008) state that decision control, translated to an upcoming investigative interview, means that suspects aim to reduce threat by deciding how to act during the interview. Information control on the other hand is the sense of control achieved by either obtaining or actively seeking information about the aversive event (Fiske & Taylor, 2008). Translated to an upcoming investigative interview,

crime suspects will try to predict specific features of the interview (e.g., the questions that will be asked) (Granhag & Hartwig, 2008).

There are multiple models of self-regulation that explain differences in how people will react in threatening or reward-promising situations and how well they will succeed when aiming to regulate their behavior. In the following, I briefly introduce some self-regulation models that are of relevance for the context of this thesis. The first model of relevance is the *Self-regulatory strength model* (Baumeister, Heatherton, & Tice, 1994) which suggests that the resources one has to self-regulate ones behavior are limited. As the amount of self-regulatory strength determines whether a person chooses to continuously carry out self-regulatory behavior (Schmeichel & Baumeister, 2004), self-regulation becomes less likely once these resources are exhausted. Translated to an interview, this model assumes differences in how successful interviewees will be in self-regulating their behavior during the interview, depending on how much self-regulatory strength they have from the start and how much of that strength they lose during the interview. Another model of relevance is the *regulatory focus theory,* which goes beyond the basic assumption of self-regulation theory (that people simply approach pleasure and avoid pain) (Higgins & Spiegel, 2004). The theory states that people can be prevention-focused (mainly concerned with safety, protection and non-losses) or promotion-focused (mainly concerned with advancement, accomplishment and gains) and that these foci co-determine which strategies people apply in order to reach a goal (Finkel, Molden, Johnson, & Eastwick, 2009; Luchies, Finkel, & Fitzsimons, 2011). In an upcoming interview, interviewees who are promotion-focused would consequently be expected to take every opportunity to convince the interviewer of their innocence, even if this brings along the risk of making mistakes. In contrast, prevention-focused interviewees would play safe and would be mainly concerned with avoiding a loss (i.e., to be perceived as deceptive by the interviewer).

To summarize, self-regulation theory broadly predicts that suspects (liars and truth tellers) will employ various strategies to achieve their goal of being believed. In order to predict behavioral differences between truth tellers and liars a fruitful avenue might be to examine the cognitive differences between them (Granhag & Hartwig, 2008).

Psychology of Guilt and Innocence

Research on the *psychology of guilt and innocence* states that, guilty as well as innocent suspects fear being perceived as liars in an upcoming interview. However, the difference is that guilty suspects often have exclusive crime-

related knowledge; knowledge which innocent suspects lack. In order to make sure that the interviewer does not find out that they hold such knowledge, guilty suspects need to decide what to avoid, deny and admit during an interview. When the suspects know what kind of crime-related information the interviewer holds, it makes sense to admit this particular information and try to give an innocent and not self-incriminating explanation for it. Much more critical are those pieces of crime-related information that the suspects do not know the interviewer holds, or pieces which they are not certain about. It makes sense to construe these pieces of information as aversive stimuli, which are likely to result in avoidance strategies. During an investigative interview guilty suspects will therefore either avoid sharing incriminating information when asked to give a free narrative, and/or deny holding incriminating information in response to direct questions (Granhag & Hartwig, 2008).

Innocent suspects, on the other hand, may fear that the interviewer may not come to know what they know (i.e., that they did not commit the crime). Therefore, they are usually eager to volunteer all information they hold and to 'tell the truth like it happened' (Hartwig et al., 2007). There is reason to believe that their decision control will be colored by basic psychological concepts, such as the world is righteous and that people will get what they deserve, and deserve what they get (the *belief in a just world*; Lerner, 1980). Another belief, the so-called *illusion of transparency* may cause innocent suspects to consider that their inner feelings and states will manifest themselves on the outside and that their innocence thus shows (Savitsky & Gilovich, 2003). These beliefs will result in more forthcoming strategies or no strategies at all (e.g., Kassin & Norwick, 2004). To sum up, although guilty and innocent suspects have the same goal (to be perceived as innocent), and can be assumed to use the same self-regulation methods to reach this goal (decision control, information control), there are reasons to believe that their strategies will differ depending on their veracity status.

Factors Moderating Suspects' Counter-Interrogation Strategies

As previously mentioned, research on suspects' counter-interrogation strategies is meager (Granhag & Vrij, 2010). However, the existing studies generally support the theoretically based reasoning outlined above. That is, the results show that guilty suspects tend to apply avoidance strategies, such as withholding information (*avoid giving a too detailed testimony; keep the*

story simple), whereas innocent suspects tend to apply more forthcoming strategies (*talk spontaneously*; *keep it real)* (e.g., Granhag & Strömwall, 2002; Strömwall et al., 2006). These results differ partly from those in the study by Hartwig et al. (2007) which shows that liars' most commonly reported strategies were to (a) tell a detailed story, (b) avoid lying and (c) tell a consistent story. In contrast, truth tellers' most commonly reported strategies were to (a) tell the truth like it happened and (b) be cooperative. A possible explanation for this diverging result might be found in the work of Kassin and Norwick (2004) who examined the reasoning of innocent and guilty mock suspects who waive their constitutional rights to silence and to agree to be interviewed. Significantly more innocent than guilty suspects waived their rights. Almost all guilty suspects waiving their rights articulated strategic self-presentation reasons for the waiver (e.g., "if I didn't, he'd figure I was guilty", "I would've looked suspicious if I chose not to talk"). Although some of the innocent waivers expressed similar concerns, the majority explained that they waived their rights precisely because they were innocent – believing, apparently, in the power of this truth to prevail (e.g., "I did nothing wrong", "didn't have anything to hide") (Kassin & Norwick, 2004). That lying mock suspects understand the impact of their statements is supported by research showing that they differ from truth-telling mock suspects in their *information management* (tendency to actively manipulate and plan the verbal content of their statement) but not in their *impression management* (the purposeful control of nonverbal and demeanor cues) (Hartwig et al., 2010; Vrij, Mann, Leal, & Granhag, 2010). Other studies (e.g., Hines et al., 2010) identified differences in both the information management and impression management of lying and truth-telling mock suspects and therefore indicate that mock suspects are – in addition to controlling their statements – aware of the importance of controlling their behavior. Children's (11-13 years old) lie-telling strategies were examined in a study by Strömwall, Granhag, and Landström (2007), who found that the most frequently reported verbal strategies were to use one's own or others' experiences or to use a lot of details in the story.

As the research reviewed above shows, the *veracity status* is one of the factors that have an impact on suspects' counter-interrogation strategies. Another factor that moderates suspects' counter-interrogation strategies is their *perception of the evidence situation*. It is reasonable to assume that most (if not all) suspects have a hypothesis about the evidence situation (i.e., a perception of how much information the police have against them) (Granhag, 2008). This perception is moderated by a number of factors, the most important of which I will outline below.

One factor moderating suspects' perception of the evidence situation is their *awareness of the evidence* (i.e., whether suspects are aware of the possibility that there is evidence against them). A recent study by Luke, Dawson, Hartwig, and Granhag (2013) found that truth tellers, independently of whether they were or were not aware of the evidence against them, adopted highly forthcoming verbal strategies. Liars' verbal strategies, on the other hand, were highly influenced by information about the possibility of evidence. When lying interviewees were informed about the possibility of evidence, the likelihood for applying a forthcoming verbal strategy increased significantly. These findings indicate that the awareness of possible evidence affects lying but not truth-telling interviewees' verbal counter-interrogation strategies.

An additional factor specifically moderating guilty suspects' perception of the evidence situation is the *degree of suspicion* directed towards them during an investigative interview. The Swedish police must declare the degree of suspicion at the outset of an investigative interview. This leads to the assumption that suspects' counter-interrogation strategies are likely to be colored by this initial declaration of suspicion. There are five different degrees of suspicion in the Swedish Code of Judicial Procedure (Polisen, 2009). First, a suspect can *appear for questioning,* which means that there is not any suspicion against that person at that moment in time. The second degree of suspicion is *may be suspected*. On this level, there exists some indication of the suspect's guilt. The third degree of suspicion is *reasonably suspected*; on this level there are concrete, objectively founded circumstances which indicate with some strength that a person has committed the crime under investigation. The fourth level of suspicion, *suspected on probable cause*, implies that the suspicion is justified on an objective appraisal. The highest degree of suspicion is that *sufficient reason exists for prosecution,* which implies that the prosecutor can expect a conviction of the suspect based on objective grounds. A study by Vrij, Mann, et al. (2007) showed that an accusatory interview style (indicating a higher degree of suspicion) had a negative effect on the length of suspects' statements and on the amount of verbal cues to deception contained in the statements. Beune, Giebels, and Sanders (2009) showed a positive relation between an actively listening interviewer (demonstrating a kind disposition and indicating a lower degree of suspicion) and suspects' willingness to give a statement. These findings support the assumption that suspects' counter-interrogation strategies may be influenced by the degree of suspicion directed towards them.

Yet another factor of relevance is the *criminal experience* of the suspect. People who have been suspects in a criminal investigation in the past have gained experience in how the legal system works and know about the possible risks of providing self-incriminating information in an investigative interview (Leo, 1996). In contrast, inexperienced suspects lack such knowledge. Therefore, behavioral differences between suspects can be assumed depending on whether or not they have experience of being interviewed. Only a few studies have examined the effect of suspects' criminal experience on their behavior during an interview. In one of the few studies on this topic, it was shown that experienced suspects are more likely to make use of their right to silence (Softley, 1980). A later study by Leo (1996) showed, in a similar vein, that more experienced suspects, were more likely to exercise their right to silence. Strömwall and Willén (2011) examined the strategies used by liars with a criminal history and found a great diversity in terms of the self-reported strategies, which ranged from avoidance strategies (*not giving away information at all*) to strategies indicating information management (*close to truth; keep it simple; rich in detail*). Although the results are somewhat different (likely due to differences in the setups used), they point in the same direction; namely that the experienced suspects know that it is not their task to convince the police of their innocence – rather it is up to the police to find evidence that prove them guilty.

In the present thesis specific attention will be paid to the *criminal experience* of the suspect and the *degree of suspicion* directed towards the suspect as two factors moderating suspects' counter-interrogation strategies (Study II). In addition, the present thesis advances the existing knowledge by examining suspects' counter-interrogation strategies when they expect to be questioned on their intentions (Study IV).

The Rationale behind the Strategic Use of Evidence Technique

The SUE-technique rests upon the theoretically driven assumption that liars and truth tellers enter an investigative interview with different mental states (Granhag & Hartwig, 2008). These different mental states result in different counter-interrogation strategies. As strategies guide actions, liars and truth tellers are assumed to act differently with respect to the crime-relevant information that might demonstrate their guilt (Granhag & Hartwig, 2008). The SUE-technique creates a situation in which suspects are questioned

without knowing about some or all of the potentially incriminating information that the police possess against them. During this questioning procedure, some of the questions address the potentially incriminating information and some do not. The aim of these questions is to systematically exhaust alternative explanations to the potentially incriminating information. In an uncertain interview situation, such as the one created in a SUE interview, suspects' counter-interrogation strategies will be triggered. Based on these strategies, guilty suspects will, when they do not know about all the evidence the interviewer holds against them, either avoid or deny holding potentially incriminating information. In contrast, innocent suspects in the same situation are assumed to volunteer even potentially incriminating details and their responses to specific questions on the event are expected to be consistent with the evidence, since they do not have anything to hide (Granhag & Hartwig, 2008). Thus, guilty (vs. innocent) suspects' statements will be significantly less consistent with the available evidence (statement-evidence consistency) when this evidence is used strategically during the interview (e.g., Hartwig et al., 2005, 2006). It should be noted that besides the form of consistency mentioned above – which is of relevance for the present thesis (statement-evidence consistency) – other forms of consistency exist. For example, a receiver may compare (i) the statement of one suspect with the statements of possible partners in crime (between-suspects consistency; Strömwall, Granhag, & Jonsson, 2003); (ii) the statement at hand with past statements from the same suspect (within-suspect consistency; Granhag & Strömwall, 2001); or (iii) the suspect's statement with one's general knowledge (logical consistency; Reinhard, Burkhardt, Sporer, & Bursch, 2002). Importantly, research has demonstrated that what all these different forms of consistency have in common is that receivers tend to focus heavily on the consistency-cue when assessing veracity (Granhag & Vrij, 2005).

Granhag (2010b) stated that the SUE-technique consists of two levels – the *strategic level* and the *tactical level*. The previously outlined case-independent and general principles that underlie the SUE-technique belong to the strategic level, which can be seen as more abstract (for more information in the principles, see Granhag & Hartwig, 2008). The tactical level is more concrete and contains a package of different case-dependent and specific tactics. Three groups of tactics, which are derived from the strategic level (i.e., the conceptual framework underlying the SUE-technique), can be identified: (i) *evidence tactics* (i.e., tactics that are used to assess the evidence), (ii) *question tactics* (i.e., tactics that are used to systematically exhaust the alternative explanations that a guilty suspect might have to the

evidence) and (iii) *disclosure tactics* (i.e., tactics that are used to disclose the evidence in the most effective manner) (Vrij & Granhag, 2012a). The so-called *Evidence Framing Matrix* (Granhag, Strömwall, et al., 2013) is an example of a disclosure tactic within the SUE-framework. It suggests that when one piece of evidence is disclosed, two different dimensions are particularly helpful in illuminating the different framing alternatives that exist. The first dimension is the *strength of the source of the evidence* (ranging from weak to strong) and the second dimension is the *degree of precision of the evidence* (ranging from low to high). These two dimensions can be orthogonally related, resulting in a matrix that can be used to visualize different alternatives with respect to how a singular piece of evidence can be framed when it is disclosed (Granhag, Strömwall, et al., 2013).

Compared to the strategic level, the tactical level is still underdeveloped (Granhag, 2010b). However, first research efforts have been made to work against this shortcoming. In the following section I give an overview of the empirical research conducted on the SUE-technique that has aimed to increase knowledge about both the strategic and the tactical level.

Empirical Research on the Strategic Use of Evidence Technique

Multiple empirical studies on the SUE-technique have shown its efficacy to elicit diagnostic cues to deception and truth (Hartwig et al., 2005, 2006, 2011; Sorochinski et al., 2013). Next to these more traditional studies on the SUE-technique, more recent publications focus on the tactical aspects. The disclosure of evidence was in this regard the main focus of interest. Granhag, Strömwall, et al. (2013) introduced a modified version of the SUE-technique, called the incremental version of SUE. This modification was derived from the *Evidence Framing Matrix* (outlined above) and Granhag and colleagues compared it with the traditional SUE-technique (disclosing all the evidence late in the interview). In the incremental version the evidence is first framed in an indirect form (weak evidence source/low degree of specificity), and is then framed more and more directly throughout the interview (strong evidence source/high degree of specificity). The authors found the highest inconsistency of the statement with the evidence (statement-evidence inconsistency) and the highest within-statement inconsistency in the 3-step SUE incremental condition (where the evidence is disclosed to the suspect in three steps) vs. the traditional SUE and the early evidence condition. These results differ partially from a structurally similar study by Luke, Hartwig, et al. (2013). In that study two incremental conditions (2-step disclosure and 4-step disclosure) were compared to early and late disclosure. The results

showed that the early disclosure was only outperformed by late disclosure and the 4-step disclosure, but not by the 2-step disclosure. In addition, within-statement inconsistencies did not differ over the compared disclosure conditions. In spite of the partially conflicting results, these findings indicate that both when and how the evidence is disclosed moderate the efficacy of disclosure. In yet another recent study Granhag, Rangmar, et al. (2013) compared two versions of the SUE-technique (traditional SUE vs. incremental SUE) in interviews with multiple suspects. Their results show that the incremental version of the SUE-technique was more successful in eliciting cues to deception and truth (e.g., higher degrees of statement-evidence inconsistency, within-statement inconsistency and between-suspects inconsistency in the statements of multiple liars (vs. truth tellers)) than the traditional version of the SUE-technique.

The present thesis advances the knowledge on the SUE-technique by testing the technique in an interview situation in which child mock suspects were questioned about their past actions (Study I), and by applying the SUE-technique to an interview situation in which adult mock suspects either lied or told the truth about their intentions (Study III).

Empirical Research on True and False Intentions

Within psycho-legal research there are only a handful studies examining true and false intentions (Granhag, 2010a). The main objective of the first studies in this field was to examine the trademarks of true and false intentions and how those trademarks manifest themselves in suspects' statements. For example, Vrij, Granhag, Mann, and Leal (2011b) conducted a study at an international airport, and showed that people who lied about their intentions (activities at their final destination), gave statements that were less plausible than, but equally as detailed as, the statements given by truth tellers. For a similar finding, see Vrij, Leal, Mann, and Granhag (2011).

The second line of studies within this field is more theory-driven and aims to increase differences between truthful and deceptive suspects' statements by examining possible cognitive differences. Granhag and Knieps (2011) assumed that the concept of *episodic future thought* (EFT) (Atance & O'Neill, 2001, 2005) plays a crucial role when forming, remembering and reporting on true and false intentions and that tapping essential EFT features can be helpful in understanding how statements on the forming of true and false intentions may differ. EFT is defined as the mental projection of the self into the future to pre-experience a one-time personal event that may occur in

the future (Schacter & Addis, 2007). Atance and O'Neil (2005) argue that an inherent feature of EFT is to take constraints into account. EFT is thus not equivalent to other acts of imagining the future (e.g., fantasizing or daydreaming about the future) as these do not necessarily handle realistic constraints. Granhag and Knieps (2011) expected and found that the processes relevant for constructing a convincing cover story (which is needed by guilty suspects in order to mask their criminal intention) are much less characterized by the typical EFT features (e.g., a vivid mental image). For example, significantly more truth tellers than liars stated that planning their future actions evoked a mental image. When liars reported to have had a mental image, their descriptions of it included significantly less words than truth tellers' descriptions. Overall, Granhag and Knieps' (2011) study showed that EFT is a helpful concept, illuminating the differences that may occur when forming true and false intentions. For studies with a similar approach, see Knieps, Granhag, and Vrij (in press-a, in press-b).

Warmelink, Vrij, Mann, and Granhag (2013) examined the effect of interviewees' veracity status (truth tellers vs. liars) on the amount of temporal and spatial detail they give in statements on their intentions. The study consisted of two experiments. In the first experiment, which was conducted in the lab, the participants were asked 26 questions. The results show that truth tellers (vs. liars) gave more spatial and temporal details, but did not mention more specific times in their statements. The second experiment, examining whether the amount of temporal information given can be increased by using a time prompting question, was conducted outside the lab (i.e., participants were on a real trip). The participants were either asked to tell the truth about the trip they were on (truth tellers) or to lie (liars). The participants were either asked to talk about their trip in as much detail as possible (control question) or to describe the time-table of their trip in as much detail as possible (time prompt question). The results show that, in the time prompt condition, truth tellers mentioned significantly more specific times than liars. Overall, the experiments indicate that the amount of spatial and temporal details, that participants' statements include, is influenced by both veracity status and the phrasing of the questions.

In yet another line of studies on true and false intentions, interview protocols that have a more strategic element are used. In a recent study by Sooniste et al. (in press) the unanticipated questions approach was extended to a setting that concerned participants' intentions. Half of the participants planned a non-criminal act (shopping for gifts in a mall), whereas the remaining half planned a mock-criminal act (placing a memory-stick containing illegal material in the same mall). All participants were

intercepted before having the chance to carry out their tasks, and were asked one set of questions on their intentions, and one set of questions on the phase in which they formed their intentions (henceforth referred to as *questions on the planning phase*). It was found that the questions on the planning phase (vs. on the intentions) were perceived as significantly less anticipated. Furthermore, differences between truth tellers and liars in terms of length of responses and level of detail were obtained for the questions on the planning phase, but not for the questions on intentions. The explanation for this finding put forth was that, as planning is an inherent part of many true intentions, the participants expressing true intentions could draw on their memory when answering questions pertaining to the planning phase. Importantly, the answers given by lying and truth-telling suspects to questions on their intentions did not differ in terms of length and level of detail. Structurally related studies by Granhag et al. (2012) (repeatedly interviewed suspects) and Sooniste et al. (2013) (interviews with small cells of suspects) report similar findings. These studies add to the research field by demonstrating differences in truth tellers' and liars' statements in terms of between-statements consistency and within-group consistency. The study by Granhag et al. (2012) showed that, when answering the anticipated questions, both truth tellers and liars displayed higher degrees of repetitions in the later interviews compared to the earlier interviews. When answering the unanticipated questions liars (vs. truth tellers) introduced more new information over time. Beyond that, Sooniste et al. (2013) demonstrated that individually interviewed members of small cells of truth tellers and liars achieved an equally high within-group consistency for their answers to questions on their intentions, whereas cells of truth tellers (vs. liars) achieved a higher within-group consistency for the answers to the questions on the planning phase.

Warmelink et al.'s study (2012) also made use of the unanticipated questions approach. In addition the authors included interviewees' previous experience of the intended event as a variable. Specifically, they examined the verbal responses of truth-telling and lying participants who were asked about a forthcoming trip that they had either made before (experienced) or had not (inexperienced). Participants were asked four different categories of questions that differed with respect to their degree of anticipation. General questions (questions that concern basic facts) were classified as more anticipated than the three categories of questions concerning (i) the core event (questions that relate to the main events of the trip), (ii) transportation (questions that relate to the trip itself) and (iii) planning (questions that relate to the planning of the trip). The results revealed that liars (vs. truth tellers) mentioned significantly more details in the anticipated section (general

questions), but significantly fewer or equally as many in the less anticipated sections (core event, transportation and planning). When splitting the sample into "experienced" and "inexperienced" participants, no significant differences were found for any of the questions categories comparing inexperienced truth tellers and liars. However, experienced liars (vs. truth tellers) gave significantly more details in the general section, and significantly fewer details in the transport and planning sections. For questions on the core event, no significant differences occurred between experienced truth tellers and liars.

To summarize, although only a small number of studies have been conducted on true and false intentions, the existing research has already contributed to a better understanding of this issue. Studies on the trademarks of true and false intentions and studies on interviewing truth tellers and liars strategically on their intentions have shown that there are detectable differences. However, more research is needed and Study III and Study IV make a contribution to increasing the knowledge on this important topic.

Methods and Methodological Considerations

There are different methods of assessing the veracity of a person. First, one can observe the nonverbal behavior (e.g., body movements, pitch of voice, pause durations, etc.). Second, one can examine physiological responses (e.g., electrodermal activity, blood pressure, heart rate, etc.). Third, one can analyze the speech content (i.e., what the person is actually saying). The SUE-technique, which is examined in the current thesis, is an interview technique that aims for and predicts the elicitation of reliable *verbal cues* to deception and truth, such as inconsistencies between the suspect's statement and the available evidence. This is why the studies included in this thesis that examine the SUE-technique (Study I and Study III) analyze verbal cues only.

Experiment 2 of Study I analyzes accuracy rates. In deception detection research global accuracy rates (i.e., combined accuracy rates for the detection of truths and lies) are often reported. In the current thesis the accuracy rates for detecting truth and deception were calculated and reported separately. Hence, it is possible to infer all four possible outcomes ((i) a liar is correctly identified as deceptive, (ii) a truth teller is correctly identified as truthful, (iii) a liar is incorrectly identified as truthful, (iv) a truth teller is incorrectly identified as deceptive). This method of separating accuracy rates is similar to *signal detection theory* (SDT) measures used in perceptual and sometimes memory tasks, but not very often in the deception research (although see

Meissner & Kassin, 2002, for an exception). The choice of percent accuracy over the SDT measures in this thesis is motivated by the fact that (a) the former is used more often in deception detection research, (b) the former is more easily understood by readers of applied scientific literature and (c) the meta-analysis of Bond and DePaulo (2006) showed that the percent accuracy measures and the SDT accuracy measures were very highly inter-correlated.

All studies included in this thesis are experimental studies conducted in the laboratory. For Study I and III this was necessary as both of these studies aimed to examine the effects of different interview techniques. In order to study this issue in a controlled way, it was necessary to use standardized interview protocols and to ask the interviewers to merely read the questions to the participants exactly as written in these protocols. Another reason for choosing the laboratory setting was that this facilitated knowledge about the ground truth (which is very difficult to establish in field studies). A commonly expressed concern about laboratory experiments is that the stakes in real-life cases are usually much higher and that the motivation of the participants to convince the receiver of their innocence is low in laboratory settings (e.g., Buckley, 2012). However, the recent meta-analysis by Hartwig and Bond (2013) shows this concern to be unfounded, by showing that lies from unmotivated senders are as detectable as lies from motivated senders.

In order to access mock suspects' counter-interrogation strategies (Study II and Study IV) the participants were asked to report the strategies they used (method of self-reports). A problem with this method is identified by research showing that reported behavior can vary from actual behavior (e.g., Ajzen, Brown, & Carvajal, 2004). However, the method of self-reports has been used in previous studies on suspects' counter-interrogation strategies and has produced satisfying results (e.g., Granhag & Strömwall, 2002; Strömwall et al., 2006). In addition, a recent study by Granhag, Mac Giolla, Strömwall, and Rangmar (2013) in which subjective measures (suspects' self-reports) were compared with objective measures (suspects' actual performance during the interview) showed similar results for these two types of measurements.

Summary of the Empirical Studies

To be able to correctly discriminate between truths and lies is of major importance in legal settings. However, deception detection research shows constantly that lay people, as well as presumed lie experts working within the legal field usually perform at chance level or only slightly better than chance level (Bond & DePaulo, 2006; Vrij & Mann, 2001a, b). One reason for these low accuracy rates is that behavioral differences between truth tellers and liars are very subtle and that there are very few reliable cues to deception (Vrij, 2008). The SUE-technique is an approach that aims to actively elicit cues to deception and truth which, in turn, will make it easier to distinguish liars from truth tellers.

The SUE-technique has been applied in past research in order to actively elicit diagnostic cues to adults' deception pertaining to their past actions, therefore increasing accuracy. In the current thesis the SUE-technique is tested for the first time on child mock suspects who are interviewed on their past actions (Study I) and on adult mock suspects who are interviewed on their future actions (Study III). In addition, this thesis explores adult suspects' counter-interrogation strategies when being interviewed on their past actions (Study II) and their future actions (Study IV).

Study I

The study consisted of two experiments. Experiment 1 focused on the elicitation of diagnostic cues to deception and truth, using the SUE-technique in interviews with children who are either guilty or innocent of a mock crime. Experiment 2 examined to what extent these cues help receivers to assess the veracity of the children's statements.

Method

Experiment 1 examined to what extent truth tellers' and liars' statements were affected by the type of interview conducted (i.e., Early Evidence interview vs. Late Evidence interview (SUE interview)). 84 children (12-14 years) were randomly allocated to one of the two veracity conditions (either truth teller or liar). The children in the truthful condition were instructed to walk one by one to a dinosaur statue at the back of the Department of Psychology and post a sheet of paper in a box which was located next to the statue. On top of the box a briefcase was located which covered the box's opening. Thus, in order to post the paper, all children had to lift the briefcase. After posting the paper, the child returned to the Department. The children assigned to the deceptive condition were instructed to complete the same task, with the only addition being that they were told to open and look inside the briefcase. In both conditions an undercover experimenter, who was placed at the door while the children were outside by the dinosaur statue, checked whether the children in the deceptive condition really opened the briefcase and looked inside (everyone did). The presence of this experimenter was also used as one piece of evidence in the following interview (see below).

In the beginning of the subsequent interview each child was asked if they confessed to the "crime" of looking inside the briefcase (nobody did). In half of the interviews that followed, the evidence was disclosed early (i.e., at the beginning of the interview) and in the other half late (i.e., in the end of the interview). Before the evidence was disclosed to the children, they were given no clue that there was any evidence speaking to their guilt. There were two pieces of evidence that the children were confronted with: (1) A witness had seen the child by the dinosaur statue and that the briefcase had been there at the same time as the child; (2) The child's fingerprints had been found on the briefcase. The second piece of evidence was supposed to be the more incriminating one. Both pieces of evidence were perceived as real by the children. The interviewer then asked the child to comment on these pieces of

evidence. All interviews were videotaped and coded in terms of omissions and statement-evidence inconsistency.

In Experiment 2, 168 adult receivers watched the interviews and were asked to judge whether the child was lying (had looked inside the briefcase) or was telling the truth (had not looked inside the briefcase). Each receiver received a case file containing background information and information on the two pieces of evidence against the child. Each receiver watched one interview, and each interview was shown to two independent receivers. After watching the interview each receiver was asked to make a dichotomous truth/lie judgment.

Results

Experiment 1 showed that the lying children omitted significantly more crime-related information than the truth-telling children. Furthermore, lying children's statements were significantly more inconsistent with the evidence than were the truth-telling children's statements. This difference was even more pronounced for the Late Evidence disclosure condition compared to the Early Evidence disclosure condition, albeit only for the more incriminating piece of evidence (the child's fingerprints on the briefcase).

Experiment 2 showed an overall accuracy level of 59.5%, which was significantly above level of chance. Broken down for each group, the receivers in the Late Evidence disclosure condition performed better than chance (63.1%) whereas the receivers in the Early Evidence condition did not (56%). However, the difference between these two conditions in terms of accuracy was non-significant. Furthermore, the receivers were significantly better at detecting truthful (70.2%) than deceptive statements (48.8%). The high accuracy rate for the truthful statements can partly be explained by the significant truth bias (60.7%). If receivers make overall more truth than lie judgments, it follows that truthful statements are identified with a higher accuracy than deceptive statements.

Correlations were calculated in order to examine the relation between the elicited cues (number of omissions in the free recall phase; degree of statement-evidence inconsistency in the specific questions phase) and the type of veracity judgments made by the receivers. Both correlations turned out to be significant, indicating that the more the suspects refrained from mentioning the evidence and the higher the degree of inconsistency between the statement and the evidence, the more likely the receivers were to assess the suspect as a liar. However, a look at the correlation coefficients showed that only a small part of the variance (9%) was explained by the elicited cues.

Conclusions

In brief, this study showed that it is possible to elicit diagnostic cues to deception and truth in statements of children by disclosing the evidence in a strategic manner, albeit only when the evidence is highly incriminating. However, this study also indicated that the receivers did not pick up on these cues and therefore obtained rather poor accuracy rates. A possible reason for this result is the somewhat passive implementation of the SUE-technique. In order for the SUE-technique to be helpful for receivers, the interviewer (applying the technique) must highlight the elicited inconsistencies and ask the suspect to explain them. If not, these statement-evidence inconsistencies will go largely undetected, or be noticed by the receivers but interpreted as non-diagnostic.

Study II

The study investigated guilty mock suspects' counter-interrogation strategies (different tactics applied by the suspect to successfully withstand the investigative interview and appear in a convincing manner) with respect to the disclosure of crime relevant information. Specifically, it was examined if disclosure of this information was moderated by (a) the suspects' criminal experience (experienced vs. naïve) and (b) the degree of suspicion directed towards the suspects (high vs. low).

Method

The naïve suspects ($N = 45$) were undergraduate students of the University of Stockholm who had never been interviewed by the police. The experienced suspects ($N = 45$) were former criminals, who were all experienced in lying to the police in a previous investigative interview. The names of the participants with a criminal past and their specific criminal background stayed unknown to the experiment leader. These participants were only asked whether they had ever lied to the police before. All participants took part in the study voluntarily and were informed that they could withdraw their participation at any given time. A questionnaire was handed out to the participants, who filled it out individually. In this questionnaire the crime scenario (a theft in a store), which they were asked to imagine being guilty of, was described and a very detailed set of background information was given. Subsequently, the participants were asked to imagine that one week after committing the crime they were called in by the police for an interview and that they decided to deny their guilt. Depending on the suspicion

condition, half of the suspects were informed that they just *appeared for questioning* (low degree of suspicion) and the other half were informed that they were *reasonably suspected* (high degree of suspicion). The dependent variable *disclosure of crime-relevant information* was operationalized as the amount of crime-relevant details mentioned in a written free recall and the amount of admitted actions in the 14 questions long specific questions phase. These questions became increasingly specific by closing in on the crime in question. Hence, the suspects could admit that they had performed a few (or several) crime related actions without confessing to the crime itself.

Results

Naïve (vs. experienced) suspects volunteered more self-incriminating information in the initial free recall phase. When asked crime-specific questions, naïve (vs. experienced) suspects admitted having committed more actions fitting with the crime under investigation. Furthermore, naïve suspects in the high-suspicion (vs. low-suspicion) condition were more willing to report information, whereas experienced suspects' willingness to report information was not affected by the degree of suspicion.

Conclusions

This study advanced the knowledge on guilty mock suspects' counter-interrogation strategies. The results suggest that naïve and experienced suspects differ with respect to how much crime-relevant information they are willing to disclose in an investigative interview. That naïve suspects disclosed more information when they were under a high degree of suspicion (vs. low degree of suspicion) suggests that they perceived that it was up to them to actively convince the interviewer of their innocence. In contrast, experienced suspects disclosed overall very little possibly self-incriminating information – demonstrating insight with respect to the fact that it is the police that need to find evidence that proves them guilty. The finding that naïve and experienced suspects' willingness to disclose information differed highlights a need for caution with respect to the overuse of naïve suspects in deception detection research.

Study III

This study examined how to elicit cues to deception and truth when a suspect is asked both about their intentions and their corresponding past planning, and when the investigator holds evidence on the suspect's planning activities.

More specifically, the major aim was to address the following situation: A suspect is about to be questioned about their intentions and about their corresponding past activities and there is available evidence that relates to their past planning activities – how should one best conduct an interview in order to elicit diagnostic cues to deception and truth?

Method

Of the 120 adults (mainly undergraduate students) who participated in the study half were asked to plan a mock crime and later lie about their intentions in the interview (liars), and half were asked to plan a non-criminal act and later tell the truth in the interview (truth tellers).

Planning phase. All participants received information about a controversial new project about to start up in the next building. The truth tellers were asked to make a legal protest to the leader of the project. Therefore, they were asked to choose one of three protest letters and to make plans for handing it over to the project leader in order to change his mind and not start the project (non-criminal intent). The liars were asked to make an illegal protest which involved installing a virus on the project leader's computer. The virus would destroy all the data and consequently the project could not be started (criminal intent). As a secondary task, the liars were asked to plan a cover story since they would need to mask their criminal intention if intercepted and questioned during their mission. All participants were given 10 minutes to plan their activities. During this time liars had to additionally plan their cover story. All participants performed the same planning activities, however, truth tellers had non-criminal reasons for doing so and liars had criminal reasons. In the end, all participants left the same three traces (i.e., pieces of evidence) which could all be used against them.

Interception and interviews. All participants were intercepted and interviewed before executing their planned actions. Liars were asked to lie to the interviewer about their criminal intention, that is, they had to use their cover story in order to avoid detection. Truth tellers were instructed to convince the interviewer of their non-criminal intention. The participants were randomly allocated to one of three structured interview protocols (Early Evidence, SUE Intent, SUE Planning).

In the *Early Evidence* condition the interviewer started the interview by confronting the suspect with all three pieces of evidence, and requested the suspect to comment on them. Next, the suspect was asked to give a free recall about what they had intended to do at the company, then the interviewer posed specific questions concerning the suspect's intention (e.g., How long had you intended to stay at the company?). Subsequently, the

interviewer asked for a free recall about the planning that the suspect had done before heading for the company, followed by specific questions (e.g., Did you sit by a computer when planning your actions?).

In the *SUE Intent* condition the same phases were included, but in a different order. These interviews started with a free recall from the suspect about what they intended to do at the company, after which the interviewer posed specific questions concerning their intention (the same as in the Early Evidence condition). After this, the interviewer asked the suspect to give a free recall about the planning they had done and to answer a few specific questions concerning the planning (the same as in the Early Evidence condition). Then the evidence against the suspect was disclosed and the suspect was requested to comment on this evidence.

The *SUE Planning* condition differed from the SUE Intent interview in that the suspects were first asked to give a free recall and answer specific questions on their prior planning, and then to give a free recall and to answer specific questions on their intentions when visiting the company. All the other steps of the interview were the same as in the SUE Intent interview.

Codings of the Statements

When the SUE-technique is applied in a setting in which the suspect is asked questions on their future actions, different forms of consistency may come into play. First, when the interviewer has knowledge (evidence) about the suspect's past planning activities that precede the intention, they can compare this to the suspect's statement on these past planning activities (Statement on Planning – Evidence on Planning comparison). In addition, the evidence on their past planning activities can be compared to what the suspect says about their intentions (Statement on Intent – Evidence on Planning comparison). As a third possible consistency comparison the suspect's statements on their past planning activities and their intentions can be compared (Statement on Planning – Statement on Intent comparison). All interviews of Study III were transcribed and coded with respect to the three comparisons.

Statement on planning – evidence on planning comparison. For this comparison both objective and subjective codings were conducted. For the objective coding, the extent to which the suspect mentioned the evidence (*free recall* part) and the extent to which the suspect's statement was inconsistent with the evidence (*specific questions* part) were coded. For the subjective coding two independent coders were asked to rate, on 7-point Likert scales for the free recall and the specific questions part separately, the degree of consistency between the suspect's statement about the planning activities and the evidence relating to the planning activities.

Statement on intent – evidence on planning comparison. For this comparison two other independent coders had to rate on 7-point Likert scales (for the free recall and the specific questions part separately), the degree to which the suspect's statement about the intended actions was consistent with the evidence about the planning activities.

Statement on planning – statement on intent comparison. For the third comparison two more independent coders were asked to rate on 7-point Likert scales how well the suspect's statement about the intended actions found support in the suspect's statement about the past planning activities.

Results

The two comparisons that related to the evidence at hand (Statement on Planning – Evidence on Planning; Statement on Intent – Evidence on Planning) both showed that liars' statements were (perceived to be) more inconsistent than truth tellers' statements. The two SUE interviews (SUE Intent and SUE Planning) were successful in eliciting diagnostic cues to deception and truth, both with respect to what was said about the future (intention), and the corresponding past (planning). The two SUE interviews were more successful in eliciting cues to deception than the Early Evidence interview. The results did not show any clear difference between the two versions of the SUE-technique, as both worked rather well. Finally, independently of the interview condition, suspects seemed to have strived for a high correspondence between their stated intentions and their stated past planning activities (intra-statement consistency).

Conclusions

The study advanced previous findings on the SUE-technique by showing that the technique can be used to elicit reliable cues to deception and truth in a situation where a suspect is asked about both their intentions and their corresponding planning activities, and when the investigator holds critical information (evidence) on these planning activities.

Study IV

The main objective of this study was to increase the knowledge on the understudied topic of suspects' counter-interrogation strategies. The study examined mock suspects' counter-interrogation strategies in interviews in which they anticipated questions on their intentions. As planning is an inherent part of many intentions, mock suspects were, in addition to

questions on their intentions (anticipated), asked a set of questions which pertained to the planning phase in which they formed their intentions (unanticipated). Truth tellers but not liars were assumed to have a memory of their planning that they could retell in the interview. The outcome of the study was expected to (a) advance the understanding of suspects' counter-interrogation strategies when anticipating questions on their intentions and (b) add to the knowledge about the unanticipated questions approach.

Method

The data for Study IV emanate from the same data collection as the data for Study III. This means, the planning phase, interception and interviewing phase were identical for Study III and Study IV. The data for Study IV were collected from the participants ($N = 120$) with a post-interview questionnaire after the interviews were finished. However, as Study IV concerned strategies formed prior to the interview (i.e., they are independent of the interview type) the analyses on truth tellers and liars were conducted across the three interview techniques used in Study III.

Post-interview questionnaire. The participants were asked to write down their principal strategy for being perceived as truthful in a free narrative. Subsequently, they were asked to rate on 7-point Likert scales the extent to which each question was (a) anticipated and (b) difficult to answer (later separate mean values for the ratings on the questions on the intentions as well as on the questions on the planning phase with regard to their level of (a) anticipation and (b) difficulty were calculated).

Coding of the free narratives. A content analysis was performed on the written statements, and data-driven sets of categories for the principal strategy stated by the participants were created. The identified verbal categories for lying mock suspects were to *Stick to the cover story* and to *Avoid lying,* for truth-telling mock suspects it was to *Be honest*. The nonverbal categories identified for lying mock suspects were to *Be calm* and to *Seem surprised*, for truth-telling mock suspects it was to *Be calm*. The strategies that could not be sorted into any of the existing categories, and were too few and diverse to constitute distinct categories of their own, were coded as *Other*. All statements indicating that a mock suspect did not employ any strategy were sorted into the category *No strategy*.

Results

Liars reported to have prepared their statements significantly more than truth tellers. It was found that both truth tellers and liars experienced the questions on the planning phase as more unanticipated than the questions on intentions.

Furthermore, it was found that liars perceived the questions on the planning phase as more difficult to answer than the questions on intentions. For truth tellers a significant but non-predicted difference between the questions on the planning phase and the questions on intentions was found; questions on the planning phase were perceived as easier to answer than questions on intentions. When comparing liars and truth tellers for the two types of questions, it was found that liars perceived the questions on the planning phase as more difficult to answer than truth tellers. No difference was found between truth tellers and liars for the questions on intentions.

Participants' self-reported counter-interrogation strategies. For truth-telling suspects two categories – one regarding the verbal content of their statements and one regarding their behavior – were identified: *Be honest* (68%) and *Be calm* (13%). The remaining responses were sorted in the category *Other* (18%). For lying suspects four categories of strategies were identified. *Stick to the cover story* (33%) and *Avoid lying* (18%) were regarded as verbal strategies, whereas *Be calm* (15%) and *Seem surprised* (10%) were regarded as nonverbal. Two lying mock suspects reported that they had no strategy at all (3%) and a few responses were sorted in the category *Other* (20%).

Conclusions

This study illustrated – in the context of interviewing mock suspects on their intentions – that asking unanticipated questions is more cognitively demanding for liars than for truth tellers. In addition, the study explained why that is by demonstrating the interrelation between mock suspects' anticipation of questions, their employed counter-interrogation strategies and the perceived difficulty of answering the questions. The results of Study IV suggest that interviewers might profit from asking questions on the planning of the stated intentions, and not only about the intentions per se.

General Discussion

In the present thesis the applicability of the SUE-technique was examined in situations in which (a) children acting as mock suspects are asked about their past actions (Study I) and (b) adult mock suspects are asked both about their intentions and corresponding past planning (Study III). In addition, this thesis aimed to increase knowledge on mock suspects' counter-interrogation strategies both when being interviewed on their past actions (Study II) and their future actions (Study IV).

Findings on the Strategic Use of Evidence Technique

Elicited Cues to Deception and Truth

Effects of veracity status. Experiment 1 of Study I aimed to actively elicit cues to deception and truth in children's statements via strategic disclosure of evidence. The results show that lying children omitted more crime-related information during the free recall phase, and were more inconsistent with the evidence in the specific questions phase, than truth-telling children. These findings are in line with the theoretical notions described by Granhag and Hartwig (2008), as well as previous empirical findings (e.g., Hartwig et al., 2005, 2006; Kassin, 2005; Kassin & Norwick, 2004).

The findings for Study III point in the same direction. The two comparisons contingent on the evidence at hand (Statement on Planning – Evidence on Planning comparison; Statement on Intent – Evidence on Planning comparison) both showed that liars' (vs. truth tellers') statements were (perceived to be) more inconsistent with the evidence. This result was found for both the free recall phase and the specific questions phase. Study III thus advanced the knowledge obtained in Study I by showing that what liars (vs. truth tellers) disclosed about their intentions fitted less well with the evidence at hand. This indicates that the degree of consistency between what is said about the future (by the suspect) and what is known about the past (by the interviewer), might be a useful cue to deception and truth. However, truth tellers and liars did not differ in their level of intra-statement consistency (Statement on Planning – Statement on Intent comparison). This finding demonstrates liars' understanding of the importance of a consistent statement

(*information management,* Hartwig et al., 2010; Vrij, Mann, Leal, & Granhag, 2010).

Effects of interview technique. In Study I statement-evidence inconsistency was higher for liars in the SUE interviews than in the Early Evidence interviews. This was however only true for the more incriminating piece of evidence. For truth tellers no significant difference was found between the two interview conditions. These results are in line with the findings of Study III.

As the interviews in Study III concerned past and future actions, two types of questions were asked during the interviews – questions on the suspects' planning activities and questions on their intentions. To test potential order effects, two versions of the SUE-technique (SUE Intent and SUE Planning) were contrasted with the Early Evidence interview. Asking the suspects about their intentions and their past planning activities, while holding evidence on their past planning activities, allowed for the comparison of three critical dimensions (Statement on Planning – Evidence on Planning comparison; Statement on Intent – Evidence on Planning comparison; Statement on Planning – Statement on Intent comparison). For the first two dimensions, the two SUE interviews elicited diagnostic cues to deception and truth, with respect to what was said about the future (intentions), and what was said about the corresponding past (planning). Beyond that, the two SUE interviews were more successful in eliciting cues to deception and truth than the Early Evidence interview. However, liars' and truth tellers' statements were perceived as having equally high correspondence between the stated intentions and what was reported with respect to the planning activities (Statement on Planning – Statement on Intent comparison). This finding was fully in line with the prediction that no matter how the suspects were interviewed with respect to the evidence at hand, they would strive for a high correspondence between the intentions stated and the past planning activities.

Study III did not show any clear difference between the two SUE versions – both seemed to work rather well. However, asking the suspect about their intentions first might be more effective than asking about their planning activities first. This is because a lying suspect, being asked about their intentions prior to being asked about their corresponding planning, might lie more freely (the future is 'open' to many different options). However, what the suspect says about the future might restrict what they can say about the corresponding past at a later stage. This in turn, might lead to a gap between what the suspect needs to say about their past planning activities and the evidence that the investigator holds on these activities (i.e., statement-evidence inconsistency). In contrast, a guilty suspect might face

fewer difficulties when they are first asked about their planning activities and subsequently about their intentions. As the future has not yet happened, it might be that it is not as difficult for the guilty suspect to make what they say about their intentions fit with what they have already said about their past activities. In addition, asking questions on the planning first might prime the suspect to believe that the interviewer may hold information about their past. Overall, the first experiment of Study I, as well as Study III, showed that the SUE-technique was successful in eliciting cues to deception and truth in the statements of children and when mock suspects were asked both about their intentions and their corresponding past planning.

Receivers' Deception Detection Accuracy

In Experiment 2 of Study I, receivers' deception detection accuracy was examined. In the SUE condition an accuracy rate significantly better than chance was found. However, a direct comparison showed that receivers in the SUE condition were not more accurate than receivers in the Early Evidence condition. Truthful statements were generally correctly identified more often than deceptive statements. This is in line with what has been found in earlier research (e.g., Vrij, 2002) and can, at least in part, be explained by receivers' tendency to make more truth than lie judgments (*truth bias*; e.g., Zuckerman et al., 1981). Consequently, the accuracy rates for detecting children's lies were rather low, which is in line with previous research (e.g., Strömwall et al., 2007; Vrij, 2002).

A possible explanation for the relatively low accuracy rates might be the manner in which the evidence was disclosed. In order to avoid intimidating the children, the interviewers did not point out actual statement-evidence inconsistencies and ask the child to explain them during the interviews. Therefore, it is likely that the receivers did not detect these statement-evidence inconsistencies or simply interpreted them as non-diagnostic. One might argue that the overall accuracy rate would have been higher if the receivers in Study I had not been passive receivers, but had interviewed the children themselves. However, results of previous research contradict this assumption by showing that untrained participants did not achieve significantly higher accuracy rates in a condition in which they could actively interview a mock suspect compared to a condition in which they passively watched the mock suspect's statement (Hartwig, Granhag, Strömwall, & Vrij, 2004). Hartwig and colleagues (2006) examined the deception detection performance of participants who actively interviewed mock suspects and who were either trained in using the evidence strategically or not. It was found that the trained interviewers achieved significantly higher accuracy rates

compared to untrained interviewers. This finding suggests that how the suspect is interviewed is of more importance for the obtained accuracy rates than the fact that the accuracy judgment is made by an active interviewer (vs. passive observer).

Relation between the Elicited Cues and Receivers' Veracity Judgments

The results of Study I indicate that the receivers, at least to some degree, perceived the elicited cues to deception and truth (number of omissions in the free recall phase; degree of statement-evidence inconsistency in the specific questions phase). Receivers assessed statements as more likely to be deceptive when they included many omissions and a higher degree of statement-evidence inconsistency. However, the data also show that receivers' judgments were mainly influenced by factors other than the elicited cues. These other factors may be incorrect beliefs that the receivers hold about cues to deception and truth. As Vrij (2008) showed, people often associate lying with cues unrelated to deception and/or are often unaware of how diagnostic cues actually relate to deception. Since research has shown that people are better at detecting truths and lies when they have more correct beliefs about cues to deception (e.g., Forrest, Feldman, & Tyler, 2004), the low deception detection accuracy rates in Study I might partly be explained by receivers relying on non-diagnostic cues.

Findings on Suspects' Counter-Interrogation Strategies

Factors Moderating Suspects' Counter-Interrogation Strategies

The aim of Study II was to examine the extent to which guilty mock suspects' disclosure of possibly self-incriminating information was moderated by (a) the suspects' criminal experience and (b) the degree of suspicion directed towards the suspects. The results indicate that suspects' criminal experience does affect their counter-interrogation strategies. Naïve (vs. experienced) suspects disclosed significantly more possibly self-incriminating information, both in the free recall phase and in the specific questions phase. These results are in line with findings from related research (e.g., Leo, 1996; Softley, 1980).

The degree of suspicion chosen for the "high degree of suspicion" condition is the third highest in the Swedish Code of Judicial Procedure. The choice was motivated by the fact that the suspects should feel that the police have some, but not all, information indicating their guilt. It was assumed that

this would leave room for the suspects to speculate how much and what kind of possibly incriminating information the police actually have and cause suspects to adapt their account to that estimation. However, the degree of suspicion only had an effect on naïve suspects' strategies. They disclosed less information in the free recall phase when they were under a low degree of suspicion than when they were under a high degree of suspicion. Naïve suspects' decision to disclose a relatively high amount of information might be caused by their perception that it is up to them to convince the interviewer of their innocence. The attempt to avoid lying, as a strategy employed by guilty naïve mock suspects, has been previously found (e.g., Granhag & Strömwall, 2002; Hartwig et al., 2007). In contrast, experienced suspects disclosed very little possibly self-incriminating information in both suspicion conditions. Their behavior seems to be mainly governed by the insight that it is the police and prosecution that need to present evidence that proves them to be guilty.

These findings allow for following conclusions. Due to the previously reported significant effects, the chosen degree of suspicion for the "high degree of suspicion" condition, even if merely midlevel according the Swedish Code of Judicial Procedure, can be considered as sufficient to affect the behavior of naïve suspects. However, for experienced suspects it is more difficult to say whether the chosen "high degree of suspicion" was sufficiently effective, as no significant effects were found for this group. One could hypothesize though, that experienced (vs. naïve) suspects simply differ in the amount of importance they assign to pre-interview information (e.g., the degree of suspicion directed towards them). In a study Strömwall and Willén (2011) show that experienced lying suspects often choose to improvise and adapt to the interview, indicating that they react to the questions presented to them, rather than to act on a previously made evaluation of the upcoming interview. It is therefore possible that experienced (vs. naïve) suspects' verbal behavior is moderated by what happens *during* the interview to a higher degree than by information given to them *before* the interview (as examined in Study II).

Suspects' Counter-Interrogation Strategies when Anticipating Questions on Intentions

Study IV differed from Study II in that it examined mock suspects' counter-interrogation strategies in situations where they anticipated questions on their intentions (and not on their past actions). In addition, Study IV included both innocent and guilty mock suspects. The aim of the study was to add to the knowledge about the unanticipated questions approach by mapping the

degree of anticipation and cognitive demand of the two sets of questions asked during the interview (questions on the intentions vs. questions on the planning phase) and connecting these measures to the principal strategies used by lying and truth-telling suspects.

Participants' ratings of level of preparation, anticipation and difficulty. The results of Study IV showed that liars prepared their statements significantly more than truth tellers, which is in line with the results of Study I, and previous research (e.g., Hartwig et al., 2007; Strömwall et al., 2006). This finding is also in line with what might be expected when considering the challenges of lying. Liars need to fabricate a consistent, reasonable story that they need to present to the interviewer in a trustworthy way. This can be assumed to be more cognitively demanding than simply reporting truthfully from memory, which is what truth tellers do (e.g., Vrij, Fisher, et al., 2008). Liars attempt to decrease the cognitive load by preparing their statement prior to the interview.

As Study IV included two types of questions (questions on intentions and questions on the planning phase), it was possible to examine differences in how anticipated these types of questions were for the mock suspects. In line with other studies on intentions (e.g., Sooniste et al., in press), truth tellers and liars perceived the questions on the planning phase as significantly more unanticipated than the questions on their intentions. An explanation for this finding is that, if the police intercept a person who is on their way to execute a certain action (i.e., intention), it is common sense that the subsequent interview will concern this future action (i.e., intention). However, being questioned by the police on the planning phase, preceding the intention, is not at all self-evident. Highly related to the ratings on the level of anticipation of the questions are the ratings on the perceived level of difficulty. Here it was found that liars perceived the questions on the planning phase as significantly more difficult to answer than the questions on their intentions. This result can be explained by the finding that liars did not anticipate the questions on the planning phase and therefore probably did not prepare answers for them. Without any preparation, they needed to decide – on the spot – both what and how much to answer to these questions, which is more cognitively demanding than recalling a ready-made answer. For truth tellers, a non-predicted difference occurred as they perceived questions on the planning phase as easier to answer than questions on their intentions. A possible explanation for this finding might be that – for truth tellers – re-experiencing (i.e., remembering) a recent action might be easier and more concrete than pre-experiencing a future action. This assumption is supported by research findings presented by D'Argembeau and Van der Linden (2004).

When comparing truth tellers and liars for the two types of questions, differences were found for questions on the planning phase, but not for questions on the intentions. This pattern of results is in line with the basic idea behind the unanticipated questions approach (Vrij, Leal, et al., 2009). As outlined above, the quality of liars' statements depends heavily on their preparation. When asked unanticipated questions, the positive effect of liars' preparation is markedly reduced and, as liars do not have the option to truthfully report from their memory (as their memory is connected to their criminal intention), the quality of their answers to the unanticipated questions will be relatively low. Unanticipated questions may cause fewer problems for truth tellers since they can resort to their memory and do not depend on pre-interview preparation. Consequently, liars' and truth tellers' answers differ more in quality for unanticipated questions than for anticipated ones.

Participants' self-reported counter-interrogation strategies. In contrast to Study II, Study IV asked participants to report their principal counter-interrogation strategy. Truth-telling mock suspects' principal counter-interrogation strategy was to *Be honest*. This was in line with what was hypothesized, as well as empirical research showing that truth-telling suspects are eager to volunteer information and to *tell the truth like it happened* without holding back information (Hartwig et al., 2007). In addition, this outcome fits well with basic psychological concepts, such as the *illusion of transparency* (Savitsky & Gilovich, 2003). Lying suspects reported that *Stick to the cover story* was their principal strategy. This strategy relates directly to their intentions and is a new research finding with respect to suspects' counter-interrogation strategies. In addition, this finding speaks to the internal consistency of the data. As lying suspects anticipated questions on their intentions, rather than questions on the planning phase, they primarily employed strategies that were geared towards masking their intentions (i.e., constructing a convincing cover story). However, as liars depend more than truth tellers on their counter-interrogation strategies, not having prepared any strategies concerning answers to questions on the planning phase made it more difficult for liars to answer these questions. These findings suggest that it might be of value to ask suspects questions on the planning phase – in addition to questions on their intentions. As liars will not be helped by their counter-interrogation strategies when asked questions on the planning phase, their answers to these questions might differ significantly from the statements of truth tellers (e.g., liars' statements might be less detailed). This argument is supported by recent findings presented by Sooniste et al. (in press). Another verbal strategy, reported by lying mock

suspects, was to *Avoid lying* which is in line with the findings of Strömwall and Willén (2011) and the results obtained from naïve suspects in Study II.

Limitations

An obvious limitation of Study I was that the interviewers did not point out the inconsistencies between the children's statements and the evidence at hand. This lack of action likely resulted in lower accuracy rates than if the existing inconsistencies had been pointed out more clearly.

Study II had three main limitations. First, in order to gain a more complete picture of suspects' counter-interrogation strategies, it would have been necessary to add innocent suspects to the sample. If this was done, important knowledge would probably have been gained which would have completed the picture of suspects' counter-interrogation strategies. Second, Study II lacks a manipulation check of the degree of suspicion, which would have helped to reveal whether the participants actually understood the differences. The obtained result – that experienced suspects were not affected by the degree of suspicion – can therefore be interpreted in two different ways. (1) They understood the meaning of the different degrees of suspicion, but were not affected by them (as previously discussed), (2) They did not understand the meaning of the different degrees of suspicion and therefore reported to behave in the way that they did. The second interpretation is unlikely to apply for experienced suspects, since they are expected to have experience with the legal system and terms. The third limitation of Study II is that it was of a pencil-and-paper type. The participants only imagined the "criminal" act, as well as the subsequent investigative interview.

A limitation of Study III was that for two of the three critical comparisons introduced (Statement on Intent – Evidence on Planning; Statement on Planning – Statement on Intent), only subjective measures were obtained. Both objective and subjective measures were used only for the Statement on Planning – Evidence on Planning comparison. Subjective measures might at first sight seem to be a rather weak method of mapping these important comparisons, but two counter-arguments can be raised. First, for the comparison where objective as well as subjective measures were available (Statement on Planning – Evidence on Planning), these two measures showed the exact same pattern of result. Second, one should consider that subjective elements are very common in many real-life situations. For example, the core of much operative intelligence work is to pull information together from different sources, often under conditions of

high time pressure (Andrew et al., 2009). Hence, the subjective element is omnipresent and many decisions have to be made without any objective standards of measurement (George & Bruce, 2008).

A limitation that Study III and Study IV share is that lying participants were instructed to prepare a cover story that they were asked to use in order to mask their criminal intention, instead of letting them decide for themselves whether they wanted to prepare one or not. In addition, the participants were provided with a frame for the main theme of that cover story which was similar to truth-telling mock suspects' actual intentions. The request for the construction of a cover story is justified by the fact that in real-life cases, criminals often prepare a cover story when planning for a criminal act (e.g., *Liquid bomb plot* in the UK; the case of Anders Behring Breivik in Norway). The participants were provided with a frame for the main theme of their cover story due to the fact that we wanted to make the statements of truth tellers and liars comparable.

A possible limitation which Study I, Study III and Study IV share is that these studies used mainly undergraduate students as mock suspects. It is most likely that one would expect students to behave differently from real criminals. The question of interest is however, if the use of students as participants results in an overestimation of the efficacy of the SUE-technique or if the opposite might be the case. A possible answer to this question can be given by Study II. This study illustrated that experienced mock suspects (i.e., former criminals) are much less willing to report crime-relevant information during an interview, than naïve mock suspects (i.e., students). For a real-life setting this means that even more room will be left for the SUE-technique to work effectively, as experienced guilty suspects tend to stay further away from the truth than naïve guilty suspects. Concerning the undergraduate students used in the study on suspects' counter-interrogation strategies when anticipating questions on their intentions: A study by Strömwall and Willén (2011), which examined lie-telling strategies used by persons with criminal experience, identified similar strategies to those found in Study IV. This speaks for a rather high external validity despite using a student sample.

Future Directions

This thesis is a further step towards exploring the potential of the SUE-technique as a method for eliciting diagnostic cues to deception and truth and towards getting a better understanding of suspects' counter-interrogation strategies. However, more research is needed on these topics. In the

following, I would like to give some recommendations about possible future deception detection research.

First of all, it is important for researchers to understand the necessity to create research settings which better mirror the situations in which practitioners assess veracity (Vrij & Granhag, 2012a). Usually receivers do have access to background information and can actively affect the course of the interview. Therefore, more studies are needed that take the available evidence against the suspects into account, as well as allowing the interviewer to take a more active role during the questioning phase (Vrij & Granhag, 2012a).

Second, as proposed by Vrij and Granhag (2012a), more attention needs to be paid to the judicial dimension of the conducted research. Deception detection research can only make a difference if the developed techniques are able to elicit cues that will be of use in court (e.g., increase the value of the evidence). The focus should therefore be more on maximizing the value of the evidence, than on finding ways to merely increase accuracy rates. However, the overview of the existing interview approaches to detect deception illustrated that some of the approaches are primarily outcome-oriented (i.e., focus mainly or exclusively on deception detection accuracy rates) or focus on cues with relatively low judicial relevance.

Third, in line with the recommendation to broaden research to include more than outcome-oriented factors alone, the current thesis is an attempt to conduct research that examines processes that explain outcomes and to gather knowledge on suspects' counter-interrogation strategies. This knowledge will in turn help to develop more refined interview techniques. A particular focus for future research should therefore be on suspects' *verbal* strategies. As a recent study by Hartwig and colleagues (2010) showed, interviewed lying and truth-telling mock suspects differed in their *information management* (the regulation and manipulation of speech content to provide a statement of denial) but not in their *impression management* (the purposeful control of nonverbal and demeanor cues).

Forth, concerning studies on false intentions, more research is needed on how to detect false intentions and about the psychological processes at play in suspects who are interviewed about their intentions. As previously mentioned, researchers have made initial attempts to examine lying about intentions (e.g., Granhag et al., 2012; Granhag & Knieps, 2011; Knieps et al. in press-a, in press-b; Sooniste et al., 2013, in press; Warmelink et al., 2012, 2013). However, more research is needed. For example, research on larger groups of people lying or telling the truth about their intentions, as terrorists typically work in networks (e.g., the *9/11-attack*).

Fifth, concerning suspects' counter-interrogation strategies when anticipating questions on their intentions, one line of future research could be to study which strategies real-life suspects apply. Another question of interest is whether lie-catchers are able to make more accurate veracity judgments based on suspects' responses to the unanticipated questions (vs. the anticipated questions).

Conclusions and Practical Implications

During the last 40 years, a number of different techniques and approaches have been introduced with the aim to improve people's ability to distinguish truth tellers from liars (Vrij, 2008). Researchers spent the majority of this time period conducting experiments in which receivers passively watched or listened to taped interviews and had no background information on the suspects, the suspects' statements or evidence to work with (Vrij, 2008). During the last ten years however, a new line of research has emerged that takes a more active approach, as it examines ways of interviewing suspects in order to elicit and enhance cues to deception (Vrij & Granhag, 2012a). An interview technique developed in connection with this new line of deception detection research is the SUE-technique. The current thesis aimed to test the applicability of the SUE-technique in previously unexplored contexts (i.e., when assessing the veracity of children's statements and when interviewing suspects on their intentions). In addition, this thesis extended the previously meager knowledge on suspects' counter-interrogation strategies in investigative interviews.

Three main conclusions can be drawn from this thesis. First, the SUE-technique is applicable when aiming to elicit cues to deception and truth in the statements of children and in interviews in which suspects anticipate questions on their intentions. Second, in an investigative interview, guilty suspects – and experienced guilty suspects in particular – tend to stay far away from the truth. This finding speaks against the possible critique that the value of the SUE-technique might decrease in real-life settings, as guilty suspects will stay very close to the truth. Third, when suspects anticipate questions on their intentions, their employed counter-interrogation strategies reflect this anticipation (i.e., they primarily prepare and employ strategies geared towards masking their intentions). This finding indicates that suspects may not employ any strategies for unanticipated questions (e.g., the planning phase of their stated intentions). Interviewers might therefore profit from

asking suspects (unanticipated) questions on the planning of their stated intentions and not only about their intentions per se.

In conclusion, this thesis not only increases the knowledge on how to elicit reliable and judicially relevant cues to deception in interviews on suspects' past actions. It also provides knowledge that can be of assistance in the investigation of crimes planned but not yet executed.

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Appendix

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