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Like Me, Do What I Say, & Think About My Influence: The Effects on Witness Choosing and Metacognition

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Like Me, Do What I Say, & Think About My Influence:
The Effects on Witness Choosing and Metacognition

A dissertation submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy in Psychology

by

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Abstract

Confidence can be a strong predictor of accuracy if circumstances are ideal (Wixted & Wells, 2017), but ideal circumstances are not always present. As such it is important to understand ways to ameliorate potentially negative effects on eyewitness metacognition. Rapport building, though seen as an important element of police/witness interaction (Vallano et al., 2015), can lead to some potentially negative memory effects (Wright et al., 2015). Additionally steering, or the process of directing a witness toward a particular suspect, can increase false identifications. Recently the researcher has developed a paradigm meant to better calibrate confidence by reinstating the context of making the identification decision. All of these variables were examined with their relation to choosing behavior and self reports of confidence in choosing. Rapport did not significantly affect anything. Steering increased the likelihood of choosing the designated suspect and decreased confidence in decisions. All of the variables interacted providing the most confidence in those who underwent the novel paradigm, had positive rapport, had not been steered, and correctly identified the guilty suspect. The implications of this research both in terms of the greater eyewitness literature and in terms of the effects on the judicial system are discussed.

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Introduction

In 1984 Jennifer Thompson had an intruder break into her apartment, hold a knife to her throat and rape her (Thompson, 2000). During the ordeal she did everything she could try to remember her attacker so that she could later identify him to police. She eventually was given a lineup. After several minutes of considering two pictures, she identified Ronald Cotton, and at trial reported her complete confidence in her identification (Weir, 2016). This confidence continued to the first trial and into a second trial, where a second victim decided that Cotton was her attacker as well. It was only when presented with DNA evidence that her confidence wavered. After 11 years Ronald Cotton was released, but the years he spent behind bars were largely due to the confidence an eyewitness had that she made the right choice (O'Neill, 2001). While this is probably one of the best known examples of a supremely confident witness, this is far from the only example. Seventy-five percent of DNA exoneration cases involved mistaken identification of innocent suspects (Innocence Project, 2009).

Research is being done in many areas of eyewitness research, but various holes still exist. Some topics are being examined primarily in how they can boost memory reports in an initial police interview, like rapport building or building a sense of relational closeness. Some topics are being looked at primarily in how they affect choosing behavior, like steering or attempting to get a witness to make a designated choice. While these areas are still under investigation and so need to be examined, they neglect the potential effects on other areas like meta-cognition and should be looked at in conjunction. Both steering and rapport have strong social elements that by virtue of their effects on the witness likely do affect the metacognition of the witness both in how they think about their choosing behavior in the lineup, often reported as confidence, and their thoughts on the witnessing conditions they experienced during the crime. As such it seems

theoretically important to examine these elements specifically and more generally these sorts of social-cognitive elements in conjunction with each other. I examined these effects together to better understand the how the social environment of a witness identification can affect both the choosing behavior of the witnesses and alter their metacognition related to that choosing decision and explored what each of these separate elements mean according to the research already conducted in isolation. The research described in this paper seeks to fill some of those holes that come from looking at these techniques in isolation and contribute to the burgeoning literature.

This literature is couched in the eyewitness field and as such it is important to have an understanding of some of the relevant terminology. This study uses lineups for the identification procedure. Lineups are often used by the police and in America typically include six face-forward color photos from which a witness can choose or a witness can choose to reject a lineup, an indication that either the perpetrator was not in the lineup or that the witness does not feel like any photo is close enough to their memory to make a choice. If the person who committed the crime is in the lineup, that lineup is considered a target present lineup with a guilty suspect. The other five photos should be description-matched, known-innocent people. Alternatively, if the person the police suspect is not the person who committed the crime, the lineup is considered a target absent lineup with an innocent suspect. Again the other five photos should be description-matched, known-innocent people. Given these understanding a witness can make one of five possible choices in a lineup. If it is a target present lineup, a witness could make a hit (correctly choose the guilty suspect), a known innocent selection, or a miss (incorrectly reject the lineup). If it is a target absent lineup, a witness could make a false alarm (incorrectly choose the innocent suspect), a known innocent selection, or correctly reject the lineup. Much of the focus of this

research is on the influence of social effects during this choosing process and how that might affect cognitive processes.

Rapport Building

Rapport building is an important element in many different fields, including education, therapeutic fields, and various business fields, but defining rapport building can be much harder. Although generally speaking, rapport building is a positive interaction between two people, the actual mechanics of that positive interaction can be very different depending on the area the rapport is being used in. A positive interaction in a therapeutic setting would likely include elements of unconditional positive regard and genuine interest in the other person (Tickle-Degnen & Rosenthal, 1990). A positive interaction in a business setting is likely going to look slightly different and focuses on personal connection, something also important in the therapeutic setting, and creating an enjoyable interaction, something less important in the clinical field (Gremner & Gwinner, 2000). The commonalities in these two settings can serve as an important point when attempting to examine rapport in the investigative field.

Only recently has rapport building techniques in the investigative field began to be defined. When asked to describe rapport in an investigative context, law enforcement interviewers included words like relationship, trust, and communication at a high rate (>19% of the time) (Vallano, Evans, Schreiber Compo, & Kieckhafer, 2015). These self-generated definitions show some commonality in the general idea of rapport in the investigative field and the previously mentioned fields. Kelly, Miller, Redlich, and Kleinman (2013) recently examined 14 techniques officers may use specifically when attempting to build rapport with a criminal suspect in a crime during an interrogation. An interrogation is a naturally combative environment as one member of the interaction is seeking an admission of guilt or guilty

intelligence from another member of the interaction, with the second member likely attempting to hide or deceptively conceal the existence of such evidence, and could require different techniques than a co-operating witness including: finding common ground, showing kindness and respect, showing patience, using similar language, and more. It is important to emphasize though that these techniques are reported when interrogating a suspect. To account for potential differences in rapport building with someone suspected of guilt and rapport building with someone who may just have information, Vallano et al. (2015) asked practicing interviewers about the techniques they use with adult witnesses and there were many commonalities with the techniques described by Kelly et al. (2013), including, discussing common interests, being polite, and self-disclosure. Although the terminology is slightly different because Vallano et al. was using self-generated terms, the meaning and behaviors to achieve those goals are very similar and the respondents in the Vallano et al. study report using 82% of reported techniques with both witnesses and suspects.

Rapport building can be an important element in interacting with eyewitnesses. Indeed, the interview technique currently recommended to officers, The Cognitive Interview, recommends taking the time to establish positive rapport with the witness (Technical Working Group, 1999). The Cognitive Interview is a technique created by combining elements found in research to increase accurate details that a witness reports. There are a variety of reasons for rapport building with the witness to help with this goal; it can increase the amount and quality of details a witness gives (Collins, Lincoln, & Frank, 2002), it can help convince a reluctant witness to conform (Dahl, Lindsay, & Brimacombe, 2006), it can help calm shaken or disturbed witnesses by lowering their levels of anxiety (Kieckhaefer, Vallano, & Schreiber Compo, 2014), and it helps communicate to the witness that the investigator cares about more than just the

information a witness can contribute (Fisher, Schreiber Compo, Rivard, & Hirn, 2014). Rapport building is considered an important and effective tool in the investigative arsenal. Rapport was found to increase accurate statements, decrease inaccurate statements, and protect against misinformation in open-ended questions (Vallano & Schreiber Compo, 2011).

As shown above rapport can be critical in creating a positive environment for a witness and can provide investigative benefits, but that is not to say that is not without potential detriments. Research has indeed found that this rapport building may actually cause false accusations and confabulations to a level similar to exposing a witness to an incriminating video (Wright, Nash, & Wade, 2015). One of the potential reasons for these opposite findings is that in the former research, the misinformation was given by a separate research assistant than the one who did the rapport building, while in the latter it was the rapport builder who contributed the information. It was also found to be one of the techniques that police most frequently used in their actual interview behavior (Schreiber Compo, Hyman Gregory, & Fisher, 2012). Sixty-five percent of interviews included positive rapport building, but 44% included negative rapport building, operationalized as intimidating or insulting the witness. The lack of consistency in what rapport is could contribute to the low rating of positive rapport and high ratings of negative rapport (Vallano & Schreiber Compo, 2011).

Much rapport building research focuses on how the technique increases witness reports (Guyll, More, Ditchfield, Marshall, & Madon; 2018; Slapinski et al., 2018; Vallano & Schreiber Compo, 2011). The effect of rapport is not limited to reporting the autobiographical memory of a witnessing event. Especially in cases where the witness is repeatedly exposed to the same officer and they continue a high level of rapport, that relationship is likely to affect the choosing behavior and metacognition of the witness during identification tasks (e.g., lineups, showups).

This hole in the literature can be problematic, especially as researchers continue to recommend the use of the Cognitive Interview which includes a rapport building aspect.

Steering

Consider a different case from the one that started this paper. A former marine, Kirk Noble Bloodsworth, was tried and convicted of the murder and sexual assault of a young girl in 1985. The sentence was death. Two years later, an appeals court granted him a new trial and again he was convicted. After nine years in prison, DNA evidence overturned his conviction and in 1993, he was released. A key piece of evidence used at the trials that convicted him was the testimony of five eyewitnesses who all asserted that he had been seen with the girl shortly before her death (Eckley, 2006). How did all five witness come to the wrong conclusion? Bloodsworth did not match the initial witness description. He was five inches shorter, had the wrong hair color and texture, and the wrong build. Two of the witnesses failed to identify him in a lineup, although they were sure by trial that he was who they had witnessed. So that left three that somehow identified the wrong man (“The Cases,” n.d). Assuming that each witness had no more than a 16% chance of mistakenly identifying an innocent suspect and if each identification attempt was truly independent, as each attempt should be, then the probability of all three making the exact same identification was less than .5% (Clark & Wells, 2008). So something was likely introduced to the situation to bias the witnesses to choose Bloodsworth. The most likely source of bias that could lead to the same innocent suspect being chosen by multiple witnesses is the fact that all the lineups were conducted by the same lineup administrator – an officer who was aware that Mr. Bloodsworth was the suspect. This cases are not unusual. One third of DNA exonerations cases that involve a mistaken identification feature a suspect mistakenly identified by multiple witnesses (Innocence Project, 2009).

The problem of a single administrator conducting lineups with multiple lineups, while knowing the identity of the suspect derives from the general finding of experimenter bias identified by Rosenthal (1977). In a series of important publications, Rosenthal and colleagues demonstrated that when an experimenter is privy to the experimental hypothesis, he or may inadvertently convey that hypothesis to the participant and thus influence the participant's response. A non-blind lineup administrator is in the same situation as a non-blind experimenter. By virtue of knowing who the suspect is, the administrator may inadvertently influence the witness's lineup choice by means of subtle verbal and or nonverbal cues (smiles, comments, asking witnesses to explore a photograph a second time, etc.).

One of the recommendations for conducting fair lineups is to have the administrator blind to the location of the suspect (McNabb, Farrell, & Brown, 2017). Research in this area commonly test participants in dyads. One participant is randomly assigned to the role of interviewer. Half of the interviewers are assigned to a condition where they are made aware of who the suspect is, either by directly telling the participant or by "accidentally" exposing the participant to that information (non-blind interviewers). The other condition the interviewer is typically given the lineup without any information about who the suspect is (blind interviewers). The second participant is assigned to the role of witness. These witnesses view a staged crime. The interviewer part of the dyad then administers the lineup to the witness part of the dyad (Dysart, Lawson, & Rainey, 2012; Zimmerman, Chorn, Rhead, Evelo, & Kovera, 2017). The general finding of these types of studies is that non-blind administration leads to higher rates of choosing innocent suspects, with many studies showing an increase in guilty suspect choosing as well (Kovera & Evelo, 2017).

There are practical reasons that can keep precincts from doing double-blind administration, such as a small precinct not having enough officers or a suspect known to all officers (McNabb et al., 2017). There are potential safeguards that can still be used though to protect against the accidental biasing behaviors. Collectively these techniques are called “blinded administration” as opposed to the common scientific term, double-blind. For instance, Haw and Fisher (2004) found that by placing the administrator behind the witness, the biasing effects of an informed administrator were diminished. Another procedure used in some precincts is the folder shuffle method. In this method a sequential lineup is presented to the witness in envelopes or folders that have been randomly shuffled by the administrator (Innocence Project, 2011). This forces a blind administration because the administrator is not sure which picture is in the folder the witness is looking at. Using a double-blind or blinded technique is an ideal process given the real world constraints of certain precincts.

Other research has examined the effect of non-blind administration by specifically encouraging the lineup administrator to engage in behaviors designed to bias the witness. This is a technique referred to as steering. Administrators in these studies may be trained in steering behaviors, such as being instructed to respond to common non-committal statements from participants in a way to direct their attention to the assigned suspect (Clark, Brower, Rosenthal, Hicks & Moreland, 2013; Clark, Marshall, & Rosenthal, 2009). For example, if the participant said, “it could be number four,” but the actual target was number six, the trained administrator might say something like “Are you saying it is number four or it looks like number four,” in an attempt to make the witness doubt their choice. The administrator could then direct the witness’s attention to the suspect by asking if they have looked at the suspect in position six. Importantly these studies often also include deception on the part of the administrator. The research

assistants running these studies are under the belief that all lineups are target present. It is likely that if the assistant were aware of target absent lineups, their behavior might have unconscious change leading to a change in the effectiveness of these false steering instances (Clark et al., 2013). These are usually research assistants and they are directed to draw attention to the suspect or to persuade the witness to identify the person who looks most similar to the suspect and then ask them if it was the suspect (Clark et al., 2009; Rhead, Rodriguez, Korobeynikov, Yip, & Kovera, 2015). Properly done, these steering behaviors produce large effects by substantially increasing the probability that the witness will select the suspect the administrator is steering them towards.

There is a common criticism in several of these studies that is important to note when discussing these results. Often times (i.e. Clark et al., 2009) the researcher uses one lineup member as the steered toward suspect. By limiting themselves to one individual, researchers allow for the suspect to be a confound. It is possible that the effects of steering may not be as strong as some would like to think, but that the suspect chosen to be steered toward is one that participants would be more likely to choose regardless of steering. As such it's important when designing studies examining steering to try and incorporate stimulus generalization as a counter-measure to these claims.

Non-blinded administration of lineups is primarily examined in relation to choosing behavior from a lineup. On the surface this makes sense as mistaken eyewitness identification is a critical issue in the justice system and if research can better understand why witnesses make a mistake, the justice system can take precautions. The problem with this view is that it looks at the choosing behavior largely in isolation. Confidence is a critically report for the criminal justice system. It influences both police and juries. Confidence when taken immediately

following identification and in conditions closely following the best practices recommendation can be indicative of accuracy (Wixted & Wells, 2017). Confidence after the event typically is less diagnostic, as is confidence that occurs in poor conditions, such as steering. As such it is important to have a stronger idea of the true impact of steering on the witness and see if there is a way to mitigate the negative effects on investigatively relevant behaviors.

Context Reinstatement

Retrospective statements of confidence, as well as other retrospective meta-cognitive judgments, require that the witness recall her or his internal mental state from the time of the identification (Shaw & Zerr, 2003). Like all memory judgments, these judgments are subject to distortion (e.g., Wells & Bradfield, 1999). The research described here examines a novel technique that may prevent some of the negative effects of some of the examples given above, specifically with the explicitly negative effects of steering behaviors and the less explicit negative behaviors associated with the positive rapport building technique.

The novel technique was built from the context reinstatement literature. Much of the context reinstatement literature works using visual cues that are meant to remind participants of the encoding that they went through previously (Hanczakowski, Zawadzka, & Macken, 2015; Hogan et al., 2012). Unsurprisingly providing visual cues reminding the participants of the encoding context leads to higher rates of recognition than providing either no context or inaccurate contexts (Hanczakowski et al., 2015). Providing accurate contexts also changes the way the brain processes and responds to the cues (Hogan et al., 2012). But the benefits of context reinstatement can come with some tradeoffs, specifically a distortion of memory that includes generation of false memories and openness to misinformation (Doss, Picart, & Gallo, 2018; Gershman, Schapiro, Hupbach, & Norman, 2013). It also can cause an increase in

confidence for the tested items (Hanczakowski, Zawadzka, & Higham, 2014), including those that are misidentified (Doss et al., 2018). All of these context reinstatements purely examine the effect of reinstating the context of studied external material.

Context reinstatement is currently being used in an eyewitness application, but in a slightly different way. Context reinstatement is an important element of the Cognitive Interview, which is the commonly suggested technique for witness interviewing (Schreiber Compo et al., 2012). The Cognitive Interview is meant to encourage as much detail from the participants as possible with minimal guidance from the officer doing the interviewing. It has been found to increase accurate details recalled compared to both not using the Cognitive Interview and for using elements from the Cognitive Interview separate from the context reinstatement (Fisher, Falkner, Trevisan, & McCauley, 2000; Fisher & Schreiber, 2007). While this is suggested and taught as part of the Cognitive Interview, training does not always mean compliance. A study of Canadian officers found that only 5.3% of officers reinstate context when utilizing this style of interview (Wright & Alison, 2004). It is important to note that the discussion above is primarily with guided imagery. While police may occasionally bring witnesses to the scene of the crime or present photos, these techniques can present more issues than help, especially if the witness is traumatized by their experience of the crime. This ability to go through mental context reinstatement may be a critical ability in successful identification. Riske, Wallace, and Allen found that accurate witnesses were significantly more likely to score highly on a imagery questionnaire (2000). This finding is important to note as the study did not include any imagery task when making the identifications, implying that there is something the participants are doing themselves. It is likely when officers guide witnesses through an imagery technique for reinstatement this effect might be larger.

The novel technique has some support for helping with metacognition accuracy, an area where context reinstatement has been woefully understudied. In ideal conditions confidence can be diagnostic of accuracy, but it's rare that ideal conditions exist in the real world (Wixted & Wells, 2017). For instance, the best time to ask for confidence is immediately following an identification, but this is not always done in the real world (Wells, Olson, & Charman, 2003). Sometimes witnesses may not give recorded statements of confidence hours, up to months or years after an identification. This situation is most dire and ideally would not be used in a criminal investigation. Instances like this may not be lost hopes though. Post-Identification Context Reinstatement (PICR) could help ameliorate the negative effects of delaying confidence reporting and allow for important and persuasive information to be used in these investigations. The script for PICR is derived from Wagstaff, Cole, Wheatcroft, Marshall, and Barsby (2007). Their script was originally for an episodic memory and was expanded here to focus on those elements important to metacognition. In a previous study, it was found that PICR significantly increased correct choosers confidence, while non-significantly decreasing incorrect choosers (Race & Lampinen, in prep). This is important as the technique was differentially affecting participants based on accuracy. This technique now needs to be tested in those areas where it could be the most helpful, specifically those non-ideal instances where the confidence-accuracy relationship is particularly problematic. More research also needs to be done in general on context reinstatement and metacognition as it is an under-examined, but critical area of eyewitness research.

Overview

For this study, I exposed participants to a video recorded crime and then induce high or minimal levels of rapport in participants using methodology based in Vallano et al. (2015).

Participants then chose from two lineups (one for the blonde perpetrator and one for the brunette perpetrator) while being exposed to steering, based on Clark et al. (2013) or no steering. After a short delay, participants either went through PICR or continue a delay procedure, after which they answer metacognitive questions and give ratings about their experience in the study. A number of hypotheses follow:

H1. Rapport building will increase choosing rates and increase confidence due to wanting to comply with a positive authority figure.

H2. Steering will increase choosing for the designated suspect. There will likely be an increase in overall choosing rate (Clark et al., 2013; Rhead et al., 2015), but the pattern of the increase is a little less understood. Clark et al. (2013) found that the discriminability of choosing is actually helped by steering, meaning that the guilty subject is chosen at a higher rate and fillers for the innocent suspect are chosen at a higher rate in the steering conditions. Rhead et al. (2015) found an increase in choosing of suspects.

H3. There will be a significant interaction between steering and rapport building with those experiencing both giving the highest number of correct suspect identifications in target present lineups and the highest number of incorrect suspect identifications in target absent lineups.

H4. Post-identification context reinstatement will differentially affect correct choosers and incorrect choosers with correct choosers showing a larger increase in confidence than incorrect choosers showing a decrease.

H5. The highest level of confidence will be in correct choosers who went through rapport building, steering, but not post-identification context reinstatement, as I expect this to allow them to recognize the external effects that may have affected their cognition.

Method

Power Analysis

A power analysis was run for the number of participants necessary for H5. The pwr library for r was used and the specific function of pwr.anova.test was used examining eight groups expecting an effect size of .1, a significance level of .05, and a power level of .7. Eight was chosen as the number of comparison groups as that is the number of groups that I as an experimenter had control over. There is not a feasible or logical way of predicting the number of correct and incorrect choosers across conditions without extensive pretesting which is resourcefully prohibitive. This suggested a sample size of 1176 and was rounded to 1200. That is the number of general psychology students that researchers attempted to analyze for this study.

Demographics

The demographics for each analysis will vary slightly. Due to the large number of analyses and data points cases were excluded on an analysis basis, meaning one participant may be in one or multiple analyses depending on the data available. There was an attention check that excluded participants if they answered the test question wrong. A total of 1279 participants were run. A total of 1188 participants are included in at least one analysis. A small number of these clicked the do not consent option, but continued with the study (<1%). The majority were excluded due to failing an attentional check asking what sort of crime had occurred. The demographics for the subset of those included in at least one analysis are as follows. The mean age was 19.24 (SD=2.53). They were vastly freshmen (64.65%), followed by sophomores (24.07%), then juniors (8.00%), and finally seniors (3.28%). They were primarily female (65.68%) with less than one percent reporting as neither male or female. The racial makeup is

similar to the typical University of Arkansas study. The majority of participants identified as white (82.66%). No other category made up more than 7% (0.17%-6.48%).

Procedure

Participants were randomly assigned to three between-subject variables. Each between-subject variable has two levels. The first variable is rapport. Experimenters either acted warmly and openly with participants from the beginning or acted cold and in a more professional manner from the beginning. Additionally, during a faux demographics questionnaire (which can be found in Appendix A), experimenters either disclosed personal information and showed interest in the participants' responses or they were short and to the point in asking the demographic questions without disclosing any additional personal information (Guyll et al, 2018; Vallano et al, 2015).

Following the initial interaction with participants and before the faux demographics questionnaire, participant watched one of two videos. In the first video, a brunette steals from an office and then a blonde steals from the office. In the second video, the thefts are reversed. The research assistant running the session stepped outside while the participant watched the video, both to avoid distracting the participant and so the assistants remained blind to the identity of the thieves. The participants retrieved the assistant from the hallway when they were done with the video. The participants then went through the faux demographics questionnaire. Given that the positive rapport faux demographics logically took longer than the no rapport, participants participated in sudoku puzzles until 15 minutes had passed from the moment they retrieved the assistant from the hallway.

The participants were then exposed to the second between-subjects variable and the within-subjects variable. Participants were given one of two six-person simultaneous lineups. It

was randomly decided as to whether the blonde lineup or the brunette lineup was given first and in what position the designated suspect was in. Separate from that randomization, one lineup was also target absent, the actual perpetrator is not a possible decision choice, and one lineup was target present, the actual perpetrator is a possible decision choice. It is important to note that the research assistants were not aware of this within-subject variable. Rather the assistants believed that both lineups were target present and there were two to examine stimulus generalization. With eyewitness experiments if the intended suspect is in some way distinctive, it could cause artificial differences in the dependent variables. While this can be an important element, it is not of interest here, but provided a good cover story for the assistants. It was important for this deception of research assistants in part because of issues with experimenter expectation effects, like those extensively studied by Rosenthal (1977), and it is a common protective element in previous studies on steering, such as (Clark et al., 2013). If the assistant has knowledge that they are presenting a target absent lineup, they may accidentally discourage participants from choosing from that lineup and could skew the results of the study. This action also provided better external validation. In a real world situation, the police are not going to present a lineup that they know to be target absent. Rather police likely present several lineups in a year that they believe are target present, but are actually target absent. This small lie to our hard-working research assistants served two purposes that are likely important. While no formalized rating of naivety to this aspect was recorded for any of the research assistants, no assistants reported any suspicion or prior knowledge of the deception when I informed them of the existence of a target absent lineup. The between-subjects variable that occurred here is either steering or no steering, modelled after Clark et al. (2013), specifically steering included behaviors like telling the participant to “take their time, drawing attention to the suspect,

suggesting the participant knows who the suspect is, among others listed in the above study” (the script for steering can be found in Appendix B). As there were some participants who identified before any steering could occur, the research assistants marked what steering behavior, if any, they did using a separate Qualtrics survey. This also allowed us to see if there is an optimum level of steering that seems to be most effective. Importantly for the steering script a witness could make a definitive choice (i.e. “it was number 3”) that included no hedge words or a non-definitive choice (i.e. “I think it was number 3” or “it could have been number 3”). The response based on the steering script will differ depending on if the choice was the suspect or a known foil. The research assistants also timed how long it takes the participant to choose from the lineup and record that information, although admittedly that timing is subject to a large amount of human error and thus not examined in this study.

Following the identification from both lineups, participants went through another distraction task, specifically they listed all the states and capitals. Some participated in the task for five minutes. Some participated in the task for two minutes and 15 seconds and then participated in the third variable, PICR (the script can be found in Appendix C). Research assistants practiced the script before running participants to ensure a consistent time of two minutes and 45 seconds. The timing was important to make sure that there was not a difference in time between the PICR and no PICR condition. The script was to be read in a calm and slow manner regardless of if the participant is in the positive rapport condition or the no rapport condition.

After the time had elapsed or the participant went through PICR, participants returned to the computer for completion of the study. The first question included a manipulation check to ensure that the participant paid enough attention to the video to recognize what sort of theft

occurred. Participants then answered questions related to both their metacognition on identification and their metacognition about the viewing experience using questions derived from the PIF questions based on Wells and Bradfield (1998; 1999). They repeated the questions for both the blonde thief and the brunette thief as it is important that we have individual ratings for both identifications for the planned analyses. The participants then answered questions from the short version of the Right-Wing Authoritarianism (RWA) scale developed by Manganelli Rattazzi, Bobbio, & Canova (2007). This was decided because participants who score highly on the dimension of authoritarian submission would probably be more likely to adhere to steering given that the experimenter would be displaying some level of authority over the participant. An explanation for some of the experimenter expectancy effects that Rosenthal (1977) identified is an adherence to authority. Since that same tenet underlies the theories behind blind administration and steering in police settings, a report on the individual participant's level of authoritarian submission can be used as a covariate for their behavior relating to the steering conditioning. After those questions the participant answered questions about their interaction with the research assistant, including questions intended to measure rapport and questions to determine how much pressure the participant felt to choose from the lineup, and answered real demographics questions. The entirety of the survey can be found in Appendix D. Following the survey, participants were thanked and excused from the lab. The entire procedure typically did not last longer 45 minutes.

Results

I wanted to understand how the effects of rapport building and steering on choosing behaviors from lineups. I also hoped to understand how rapport building, steering, and post-identification context reinstatement (PICR) on retrospective confidence and other meta-cognitive

judgments. Recall that in every police lineup there is a suspect and a set of known innocent fillers. The suspect is the person that the police believe may be guilty. In reality, the suspect may be guilty (target present lineup) or the suspect may be innocent (target absent lineup). When analyzing lineup data, there are two kinds of relevant choosing effects. Researchers can look at the overall rate of choosing from the lineup, regardless of whether the suspect was chosen or a filler was chosen. This overall choosing rate provides an index of response bias. Alternatively, researchers may focus more specifically on the choosing of the designated suspect. The choosing rate of the designated suspect is important for two reasons. First, choosing of the designated suspect provides an index of memory discriminability. That is, to the degree that a witness has a good memory for the perpetrator, then the choosing rate for the designated suspect will tend to be high for target present lineups and low for target absent lineups. Choosing rate of the designated suspect is also the most forensically relevant type of choosing. When a witness picks a filler it is a known error. The suspect's jeopardy is not increased when a filler is chosen because the filler is known to be innocent. However, when the witness picks a suspect, that suspect's jeopardy has increased substantially, especially if the witness indicates that she or he is very confident. Choosing of a designated suspect from a target present lineup has positive utility. Choosing of a designated suspect from a target absent lineup has negative utility.

To examine choosing behavior in both target present and target absent lineups, a logistic regression was used examining both steering and rapport in multiple theoretically relevant ways and collapsing across PICR condition as this variable occurs after the choosing behavior. Additionally, ANOVAs were used to examine the most germane metacognitive variable, confidence, as affected by the variables of interest and MANOVAs for the other metacognitive variables reported (Stebly, Wells, & Douglass, 2014). Although data was collected from 1200

participants, not all 1200 were included in all analyses for a variety of reasons, although the most common reason was a lack of following of instructions regarding answering the metacognitive questions.

Manipulation Checks

A series of manipulation checks were run to ensure the variables were being perceived in the way intended. For rapport an independent t-test was run using a self-report measure designed to measure rapport. This measure had 27 questions asking for ratings on both the experimenter themselves and the interactions with the experimenter. A factor analysis was run using varimax rotation to ensure that the measures were properly being used. Eighteen questions were included in the final calculation with four being reversed coded. The criteria for inclusion was .3 or above. The questions were on a five point scale ranging from -2 to +2. This means the greatest rapport total one individual could report is 36. There was a significant difference between conditions, $t(1151)=8.83, p<.001$. Those in the positive rapport condition reported a mean total of 24.46 (SD=8.50). Those in the no rapport condition reported a mean total of 19.50 (SD=10.48). Additionally it was checked to make sure that steering did not have a significant effect on perception of rapport as this measure was conducted after the steering had occurred and it is possible that there may have been a change in participant perception of rapport if they felt pressured to choose from either lineup. This was not the case either as a main effect, $F(1, 1130)=0.41, p=.523$, or as an interaction with rapport, $F(1, 1130)=1.00, p=.317$.

To check steering, a t test was initially run using assigned condition for both pressure to choose from the target present lineup and the target absent lineup coded on a 7 point likert scale. Target present approached significance, $t(838)=1.79, p=.074$, but target absent was not significant, $t(839)=1.39, p=.166$. As a reminder, it was possible for a participant to be assigned

to steering, but not receive any steering if an immediate definitive choice was made. For target present lineups, there was a significant difference in feelings of pressure to choose for participants who experienced steering in comparison to those who did not, $t(838)=-2.73, p=.007$. Those who experienced steering reported an average of 3.94 of pressure to choose ($SD=1.83$) and those who did not experience steering reported an average of 3.59 of pressure to choose ($SD=1.91$). For target absent lineups, there was a significant difference as well, $t(838)=-2.10, p=.036$. Those who experience steering reported an average of 3.79 of pressure to choose ($SD=1.87$) and those who did not experience steering reported an average of 3.51 of pressure to choose ($SD=1.87$).

Additionally, a correlation analysis was run to examine the relationship between the amount of steering behaviors and the reported pressure to choose and the reported rapport. The amount of steering behaviors could range from 0-6. The amount of steering for target present lineups significantly correlated with the reported pressure to choose from target present lineups, $r(840)=.12, p=.001$, the amount of steering for target absent lineups, $r(827)=.75, p<.001$, the reported pressure to choose from a target absent lineup, $r(827)=.07, p=.041$, and was not correlated with self-reported rapport, $r(814)=-.001, p=.969$. The amount of steering for target absent lineups correlated with the amount of steering for target absent as mentioned above, was not correlated with self-reported pressure to choose from target present lineups, $r(827)=.05, p=.194$, importantly it did correlate with the self-reported pressure to choose from target absent lineups, $r(841)=.11, p=.002$, and was not correlated with self-reported rapport, $r(817)=.004, p=.909$. Self-reported rapport was negatively correlated with both self-reported pressure to choose from target present lineups, $r(814)=-.08, p=.018$, and self-reported pressure to choose from target absent lineups, $r(817)=-.09, p=.009$.

Based on these checks, I believe my variables were valid.

Logistic Regressions

As I have built my steering paradigm on that used by Clark et al. (2013), I sought to mimic his analysis of results as best as possible given that this study has a more complicated design than that used in his study. They used chi-square testing to examine the effects of steering on choosing. I have decided given the constraints of my study, the best correlate to understand both suspect choosing and overall choosing would be to use a binary logistic regression.

Suspect Choosing.

The following analyses are meant to better understand hypotheses 1-3.

For target present lineups, a binary logistic regression with rapport as the initial block, dichotomous steering variable (whether at least one steering behavior actually occurred) as the second block, and with the interaction between these two variables as the third block on choosing of the guilty suspect. One of the main hypotheses was that rapport building would make steering more effective. Additionally, although Clark et al. (2013) did have a list of steering behaviors, the analyses conducted used steering (in their article termed, influence) as a dichotomous variable. This analysis presents the closest analogy to the initial article. The initial regression was not significant, $\chi^2(1, N=1171)= 0.54, p=.461$. It explained .1% of variance in choosing according to the Nagelkerke R^2 and correctly categorized 82.6% of cases. Steering behavior was significant both as a block, $\chi^2(1, N=1171)= 7.05, p=.008$, and including it in the model, $\chi^2(2, N=1171)= 7.60, p=.022$. The model at this stage explained 1.1% of variance in model Nagelkerke R^2 and correctly categorized 82.6% of cases. Receiving at least one steering behavior increased the odds of choosing the suspect 1.51 times. The interaction term was not

significant as a block, $\chi^2(1, N=1171)= 0.16, p=.687$, and approached significance when including it in the model, $\chi^2(3, N=1171)= 7.76, p=.051$. The model at this stage explained 1.1% of variance in model Nagelkerke R^2 and correctly categorized 82.6% of cases. Receiving at least one steering behavior increased the odds of choosing the suspect 1.61 times. The raw numbers of choosing behaviors as a function of rapport and dichotomous steering can be seen in Table 1.

For target present lineups, a binary logistic regression with rapport as the initial block, a continuous variable on the amount of steering (from 0-6) that actually occurred as the second block, and the interaction between these two variables as the third block on the likelihood of choosing the suspect from the lineups. There is a possibility of steering behavior compounding to change the behavior of choosing the suspect from the lineup and so this analysis was meant to examine how an increase in steering behaviors might affect choosing of the suspect. Steering behavior was significant both as a block, $\chi^2(1, N=1171)= 9.90, p=.002$, and including it in the model, $\chi^2(2, N=1171)= 10.44, p=.005$. The model at this stage explained 1.5% of variance in model Nagelkerke R^2 and correctly categorized 82.6% of cases. For every increase in steering behavior, the odds of choosing the suspect increased 1.18 times. The interaction term was not significant as a block, $\chi^2(1, N=1171)= 0.16, p=.687$, and was significant when included in the model, $\chi^2(3, N=1171)= 10.46, p=.015$. The model at this stage explained 1.5% of variance in model Nagelkerke R^2 and correctly categorized 82.6% of cases. For every increase in steering behavior, the odds of choosing the suspect increased 1.17 times.

For target present lineups, a binary logistic regression with rapport as the initial block and six dummy coded variables for the presence of individual steering behaviors that actually occurred as the second block on the likelihood of choosing the suspect from the lineups. These behaviors are all the ones the research assistants were instructed to use based on the responses

from the participants and were used due to the Clark et al. (2013) paradigm. It seems logical that a behavior such as instructing the participant to “take their time” would likely lead to less consistent choosing of the suspect than a behavior like “drawing attention to the suspect”. This analysis was to better understand what steering behaviors may actually matter. Steering behavior was significant both as a block, $\chi^2(6, N=1171)= 23.74, p=.001$, and including it in the model, $\chi^2(7, N=1171)= 24.28, p=.001$. The model at this stage explained 3.4% of variance in model Nagelkerke R^2 and correctly categorized 82.7% of cases. Participants who were given the “draw attention to the suspect” steering behavior were 2.08 times more likely to make a suspect identification.

For target present lineups, a binary logistic regression with self-reported rapport as the initial block, self-reported pressure to choose from the target present lineup, and the interaction between these two variables as the third block on the likelihood of choosing the suspect from the lineups. This analysis was to understand how the participants’ subjective experience in the study might affect the choosing rates of the suspect. The initial model was not significant, $\chi^2(1, N=814)= 0.34, p=.561$. It explained .1% of variance in choosing according to the Nagelkerke R^2 and correctly categorized 82.2% of cases. Pressure to choose was not significant both as a block, $\chi^2(1, N=814)= 0.20, p=.655$, and including it in the model, $\chi^2(2, N=814)= 0.54, p=.764$. The model at this stage explained .1% of variance in model Nagelkerke R^2 and correctly categorized 82.2% of cases. The interaction term was not significant as a block, $\chi^2(1, N=814)= 2.36, p=.125$, and was not significant when included in the model, $\chi^2(3, N=814)= 2.90, p=.408$. The model at this stage explained .6% of variance in model Nagelkerke R^2 and correctly categorized 82.2% of cases.

For target present lineups, regressions were run to examine the effects of opinions on police, steering examined as above (dichotomous, amount of steering, and self-reported pressure), and the interactions on the likelihood of choosing the suspect from the lineups. It was hypothesized that participants that have a high opinion of the police may be more likely to choose from the lineup and be more influenced by the steering behaviors. The initial block of police opinion was not significant, $\chi^2(1, N=1171) = .01, p = .905$. The interaction blocks and models were not significantly different than the steering effects as listed above.

For target present lineups, regressions were run to examine the effects of right-wing authoritarianism (RWA), steering examined as above, and the interactions on the likelihood of choosing the suspect from the lineups. One of the explanations for why steering may work is an acquiescence to authority. People who are high in right wing authoritarianism tend to be more respectful and responsive to authority. The initial block of RWA was not significant, $\chi^2(1, N=1171) = .14, p = .708$. The interaction blocks and models were not significantly different than the steering effects as listed above.

The process of choosing from a target present lineup is different than the process of choosing from a target absent lineup, even if the participant is unaware of the type of lineup. A target present lineup will have one right answer that is a physical person and that should elicit at least some match to memory. For a target absent lineup, the right answer is to not make a choice as the guilty suspect is not one of the possible alternatives. As such, it is important to analyze these choosing effects separately. As a result all analyses done on target present lineups are repeated for target absent with the same theoretical justification as mentioned above.

Although Clark et al. (2013) did have a list of steering behaviors, the analyses conducted used steering (in their article termed, influence) as a dichotomous variable. This analysis

presents the closest analogy to the initial article. For target absent lineups, a binary logistic regression with rapport as the initial block, dichotomous steering variable (whether at least one steering behavior actually occurred) as the second block, and with the interaction between these two variables as the third block on choosing of the designated suspect. The initial regression was not significant, $\chi^2(1, N=1172)= 0.14, p=.711$. It explained 0% of variance in choosing according to the Nagelkerke R^2 and correctly categorized 85.8% of cases. Steering behavior was not significant both as a block, $\chi^2(1, N=1172)= 2.08, p=.150$, and including it in the model, $\chi^2(2, N=1172)= 2.21, p=.331$. The model at this stage explained .3% of variance in model Nagelkerke R^2 and correctly categorized 85.8% of cases. The interaction term was not significant as a block, $\chi^2(1, N=1172)= 0.88, p=.349$, and was not significant when including it in the model, $\chi^2(3, N=1172)= 3.09, p=.378$. The model at this stage explained .5% of variance in model Nagelkerke R^2 and correctly categorized 85.8% of cases.

For target absent lineups, a binary logistic regression with rapport as the initial block, a continuous variable on the amount of steering (from 0-6) that actually occurred as the second block, and the interaction between these two variables as the third block on the likelihood of choosing the suspect from the lineups. There is a possibility of steering behavior compounding to change the behavior of choosing the suspect from the lineup and so this analysis was meant to examine how an increase in steering behaviors might affect choosing of the designated suspect. Steering behavior was significant both as a block, $\chi^2(1, N=1172)= 8.03, p=.005$, and including it in the model, $\chi^2(2, N=1172)= 8.17, p=.017$. The model at this stage explained 1.2% of variance in model Nagelkerke R^2 and correctly categorized 85.8% of cases. For every increase in steering behavior, the odds of choosing the suspect increased 1.18 times. The interaction term was not significant as a block, $\chi^2(1, N=1172)= 0.51, p=.475$, and was significant when included in the

model, $\chi^2(3, N=1172)= 8.68, p=.034$. The model at this stage explained 1.3% of variance in model Nagelkerke R^2 and correctly categorized 85.8% of cases. For every increase in steering behavior, the odds of choosing the suspect increased 1.22 times.

For target absent lineups, a binary logistic regression with rapport as the initial block and six dummy coded variables for the presence of individual steering behaviors that actually occurred as the second block on the likelihood of choosing the suspect from the lineups. These behaviors are all the ones the research assistants were instructed to use based on the responses from the participants and were used due to the Clark et al. (2013) paradigm. It seems logical that a behavior such as instructing the participant to “take their time” would likely lead to less consistent choosing of the suspect than a behavior like “drawing attention to the suspect.” This analysis was to better understand what steering behaviors may actually matter in a target absent lineup. Steering behavior was significant both as a block, $\chi^2(6, N=1172)= 13.41, p=.037$, and approached significance in the model, $\chi^2(7, N=1172)= 13.55, p=.060$. The model at this stage explained 2.1% of variance in model Nagelkerke R^2 and correctly categorized 85.8% of cases. Participants who were given the “draw attention to the suspect” steering behavior were 1.89 times more likely to make a suspect identification.

For target absent lineups, a binary logistic regression with self-reported rapport as the initial block, self-reported pressure to choose from the target absent lineup, and the interaction between these two variables as the third block on the likelihood of choosing the suspect from the lineups. This analysis was to understand how the participants’ subjective experience in the study might affect the choosing rates of the designated suspect. The initial model was not significant, $\chi^2(1, N=817)= 0.03, p=.855$. It explained 0% of variance in choosing according to the Nagelkerke R^2 and correctly categorized 85.1% of cases. Pressure to choose was not significant

both as a block, $\chi^2(1, N=817)= 2.38, p=.115$, and including it in the model, $\chi^2(2, N=817)= 2.52, p=.284$. The model at this stage explained .5% of variance in model Nagelkerke R^2 and correctly categorized 85.1% of cases. The interaction term was not significant as a block, $\chi^2(1, N=817)= 0.09, p=.764$, and was not significant when included in the model, $\chi^2(3, N=817)= 2.61, p=.457$. The model at this stage explained .6% of variance in model Nagelkerke R^2 and correctly categorized 85.1% of cases.

For target absent lineups, regressions were run to examine the effects of opinions on police, steering examined as above, and the interactions on the likelihood of choosing the designated suspect from the lineups. It was hypothesized that participants that have a high opinion of the police may be more likely to choose from the lineup and be more influenced by the steering behaviors. The initial block of police opinion was not significant, $\chi^2(1, N=1172)= .08, p=.776$. Generally the interactions blocks and models were not significantly different than the steering effects as listed above.

For target absent lineups, regressions were run to examine the effects of right-wing authoritarianism (RWA), steering examined as above, and the interactions on the likelihood of choosing the suspect from the lineups. One of the explanations for why steering may work is an acquiescence to authority. People who are high in right wing authoritarianism tend to be more respectful and responsive to authority. The initial block of RWA was not significant, $\chi^2(1, N=1172)= .93, p=.334$. Generally the interactions blocks and models were not significantly different than the steering effects as listed above.

Overall Choosing.

The following analyses are meant to better understand hypotheses 1 and 3.

There have been some disagreements about what steering actually does. Some suggest that it is causing witnesses that would not have chosen (or would have rejected the lineups) to change their decision and choose from the lineup (e.g. Rhead et al., 2015). Others, including Clark, have suggested that it is not causing rejections to turn to identifications, but instead is changing those who would have chosen a known innocent filler to choose the designated suspect. Additionally, I hypothesized that rapport may lead to more overall choosing as choosing from the lineup seems to be what the person that the witness/participant has just built a relationship with would like to happen. To have a better understanding on what these two variables do to overall choosing, logistic regressions matching those in the suspect choosing analyses were run, as the reasoning behind choosing of the suspect can also be applied to overall choosing.

For target present lineups, a binary logistic regression with rapport as the initial block, dichotomous steering variable (whether at least one steering behavior actually occurred) as the second block, and with the interaction between these two variables as the third block on choosing from the lineup. Again this is the closest correlate to the Clark et al. (2013) article that served as a paradigm guide for this study. The initial regression was not significant, $\chi^2(1, N=1171)=0.33, p=.569$. It explained 0% of variance in choosing according to the Nagelkerke R^2 and correctly categorized 80.0% of cases. Steering behavior was not significant both as a block, $\chi^2(1, N=1171)=0.17, p=.676$, and including it in the model, $\chi^2(2, N=1171)=0.50, p=.779$. The model at this stage explained .1% of variance in model Nagelkerke R^2 and correctly categorized 80.0% of cases. The interaction term was not significant as a block, $\chi^2(1, N=1171)=0.09, p=.760$, and was not significant when including it in the model, $\chi^2(3, N=1171)=0.59, p=.898$. The model at this stage explained .1% of variance in model Nagelkerke R^2 and correctly categorized 80.0% of cases.

For target present lineups, a binary logistic regression with rapport as the initial block, a continuous variable on the amount of steering (from 0-6) that actually occurred as the second block, and the interaction between these two variables as the third block on the likelihood of choosing from the lineups. Just as increasing in steering behavior may matter for choosing of the suspect, it may matter for general choosing as well. Steering behavior was not significant both as a block, $\chi^2(1, N=1171)= 0.96, p=.328$, and including it in the model, $\chi^2(2, N=1171)= 1.28, p=.527$. The model at this stage explained .2% of variance in model Nagelkerke R^2 and correctly categorized 80.0% of cases. The interaction term was not significant as a block, $\chi^2(1, N=1171)= 0.20, p=.652$, and was significant when included in the model, $\chi^2(3, N=1171)= 1.49, p=.686$. The model at this stage explained .2% of variance in model Nagelkerke R^2 and correctly categorized 80.0% of cases.

For target present lineups, a binary logistic regression with rapport as the initial block and six dummy coded variables for the presence of individual steering behaviors that actually occurred as the second block on the likelihood of choosing from the lineups. This analysis allows for an examination of what steering behaviors may matter when it comes to overall choosing behavior. Steering behavior approached significance both as a block, $\chi^2(6, N=1171)= 11.98, p=.062$, and including it in the model, $\chi^2(7, N=1171)= 12.31, p=.091$. The model at this stage explained 1.7% of variance in model Nagelkerke R^2 and correctly categorized 80.0% of cases. Participants who were given the “is similar to or is the suspect” steering behavior were 3.12 times more likely to make an identification.

For target present lineups, a binary logistic regression with self-reported rapport as the initial block, self-reported pressure to choose from the target present lineup, and the interaction between these two variables as the third block on the likelihood of choosing from the lineups.

The analysis that follows is to better understand how the participants' subjective experience in the study may have affected their general choosing behavior. The initial model was not significant, $\chi^2(1, N=814)= 1.21, p=.272$. It explained .2% of variance in choosing according to the Nagelkerke R^2 and correctly categorized 79.7% of cases. Pressure to choose was significant both as a block, $\chi^2(1, N=814)= 22.64, p<.001$, and including it in the model, $\chi^2(2, N=814)= 23.85, p<.001$. The model at this stage explained 4.5% of variance in model Nagelkerke R^2 and correctly categorized 79.7% of cases. For every increase in reported pressure to choose, the odds of choosing from the lineup increased 1.25 times. The interaction term was not significant as a block, $\chi^2(1, N=814)= .69, p=.407$, and was significant when included in the model, $\chi^2(3, N=814)= 24.54, p<.001$. The model at this stage explained 4.7% of variance in model Nagelkerke R^2 and correctly categorized 79.7% of cases. For every increase in reported pressure to choose, the odds of choosing from the lineup increased 1.37 times.

For target present lineups, regressions were run to examine the effects of opinions on police, steering examined as above, and the interactions on the likelihood of choosing someone from the lineups. Participants who are particularly positive in their view of police may be more likely to choose anyone from a lineup. The initial block of police opinion was not significant, $\chi^2(1, N=1171)= .40, p=.528$. Generally the interactions blocks and models were not significantly different than the steering effects as listed above. An exception was opinions of police, steering dichotomously coded, and the interaction. The model was still not significant when including steering as a main effect, $\chi^2(2, N=1171)= .57, p=.754$. The interaction approached significance as a block, $\chi^2(1, N=1171)= 3.47, p=.063$. The model was still not significant $\chi^2(3, N=1171)= 4.03, p=.258$.

For target present lineups, regressions were run to examine the effects of right-wing authoritarianism (RWA), steering examined as above, and the interactions on the likelihood of choosing from the lineups. A common explanation for experimenter effects is an obedience to authority, so people high in right wing authoritarianism may be more likely to be steered into choosing anyone from the lineup. The initial block of RWA was not significant, $\chi^2(1, N=1171)= 2.15, p=.143$. Generally the interactions blocks and models were not significantly different than the steering effects as listed above.

For target absent lineups, a binary logistic regression with rapport as the initial block, dichotomous steering variable (whether at least one steering behavior actually occurred) as the second block, and with the interaction between these two variables as the third block on choosing from the lineups. Again this is the closest correlate to the Clark et al. (2013) article that served as a paradigm guide for this study. The initial regression was not significant, $\chi^2(1, N=1172)= 0.05, p=.821$. It explained 0% of variance in choosing according to the Nagelkerke R^2 and correctly categorized 78.8% of cases. Steering behavior approached significance as a block, $\chi^2(1, N=1172)= 3.47, p=.062$, and was not significant when included in the model, $\chi^2(2, N=1172)= 3.53, p=.172$. The model at this stage explained .5% of variance in model Nagelkerke R^2 and correctly categorized 78.8% of cases. The interaction term was not significant as a block, $\chi^2(1, N=1172)= 0.66, p=.418$, and was not significant when including it in the model, $\chi^2(3, N=1172)= 4.18, p=.243$. The model at this stage explained .6% of variance in model Nagelkerke R^2 and correctly categorized 78.8% of cases.

For target absent lineups, a binary logistic regression with rapport as the initial block, a continuous variable on the amount of steering (from 0-6) that actually occurred as the second block, and the interaction between these two variables as the third block on the likelihood of

choosing from the lineups. Just as increasing in steering behavior may matter for choosing of the suspect, it may matter for general choosing as well. Steering behavior was significant as a block, $\chi^2(1, N=1172)= 5.78, p=.016$, and approached significance in the model, $\chi^2(2, N=1172)= 5.83, p=.054$. The model at this stage explained .8% of variance in model Nagelkerke R^2 and correctly categorized 78.8% of cases. For every increase in steering behavior, the odds of choosing the suspect increased 1.14 times. The interaction term was not significant as a block, $\chi^2(1, N=1172)= 0.17, p=.684$, and was not significant when included in the model, $\chi^2(3, N=1172)= 5.99, p=.112$. The model at this stage explained .8% of variance in model Nagelkerke R^2 and correctly categorized 78.8% of cases.

For target absent lineups, a binary logistic regression with rapport as the initial block and six dummy coded variables for the presence of individual steering behaviors that actually occurred as the second block on the likelihood of choosing from the lineups. This analysis allows for an examination of what steering behaviors may matter when it comes to overall choosing behavior. Steering behavior was significant as a block, $\chi^2(6, N=1172)= 21.04, p=.002$, and was significant when included in the model, $\chi^2(7, N=1172)= 21.09, p=.004$. The model at this stage explained 2.8% of variance in model Nagelkerke R^2 and correctly categorized 78.8% of cases. Participants who were given the “similar to or is the suspect” steering behavior were 5.41 times more likely to make an identification.

For target absent lineups, a binary logistic regression with self-reported rapport as the initial block, self-reported pressure to choose from the target absent lineup, and the interaction between these two variables as the third block on the likelihood of choosing from the lineups. The analysis that follows is to better understand how the participants’ subjective experience in the study may have affected their general choosing behavior. The initial model was not

significant, $\chi^2(1, N=817)= 0.48, p=.826$. It explained 0% of variance in choosing according to the Nagelkerke R^2 and correctly categorized 79.9% of cases. Steering behavior was significant both as a block, $\chi^2(1, N=817)= 17.17, p<.001$, and including it in the model, $\chi^2(2, N=817)= 17.22, p<.001$. The model at this stage explained 3.3% of variance in model Nagelkerke R^2 and correctly categorized 79.9% of cases. For every increase in reported pressure to choose, the odds of choosing from the lineup increased 1.22 times. The interaction term was not significant as a block, $\chi^2(1, N=817)= 0.02, p=.889$, and was significant when included in the model, $\chi^2(3, N=817)= 17.24, p=.001$. The model at this stage explained 3.3 % of variance in model Nagelkerke R^2 and correctly categorized 79.9% of cases. For every increase in reported pressure to choose, the odds of choosing from the lineup increased 1.24 times.

For target absent lineups, regressions were run to examine the effects of opinions on police, steering examined as above, and the interactions on the likelihood of choosing someone from the lineups. Participants who are particularly positive in their view of police may be more likely to choose anyone from a lineup. The initial block of police opinion was not significant, $\chi^2(1, N=1172)= .17, p=.677$. Generally the interactions blocks and models were not significantly different than the steering effects as listed above.

For target absent lineups, regressions were run to examine the effects of right-wing authoritarianism (RWA), steering examined as above, and the interactions on the likelihood of choosing someone from the lineups. A common explanation for experimenter effects is an obedience to authority, so people high in right wing authoritarianism may be more likely to be steered into choosing anyone from the lineup. The initial block of RWA was not significant, $\chi^2(1, N=1172)= .64, p=.425$. Generally the interactions blocks and models were not significantly different than the steering effects as listed above.

ANOVAs and MANOVAs

The following analyses are meant to better understand hypotheses 4 and 5.

The second group of statistics examined the post-identification variables looking at the various metacognitive aspects. All of these variables exist on a likert scale ranging from 1-7. These variables will be examined using inferential statistics, including ANOVAs for confidence and MANOVAs for the PIF questions, Again since each participant is making two choices, they typically provide different ratings for each lineup, which is why the participants are instructed to respond while thinking about the blonde lineup once and while thinking about the brunette lineup once and asked them to report which lineup they answered those questions for.

Target Present Confidence.

An ANOVA was run examining the effects of rapport, PICR, steering occurring, and the type of choice made (rejection, designated suspect choice, filler choice) on confidence. Again because the methodology of choosing from a target present lineup is different from choosing from a target absent lineup, it is important to examine the confidence of target present separately from the confidence of target absent as they are essentially two different tasks. Two significant main effects emerged, steering occurring, $F(1, 1096)=4.10, p=.043$, and the type of choice made, $F(2, 1096)=23.58, p<.001$. Confidence was higher for those that did not experience steering (3.48) than those who did (3.24). Tukey's post hoc tests found that those that rejected the lineups were significantly less confident (2.81) than either those that chose the guilty suspect (3.95) or who chose a filler (3.30). Those who chose the guilty suspect, thus making the correct choice, were also significantly more confident than those who chose the filler. The interaction between all four independent variables was significant as well, $F(2, 1096)=3.15, p=.043$.

The interaction was further explored to understand the impetus of the interaction and all means and standard deviations for the four way interaction are available in Table 2. Using Tukey's post hoc tests a decrease in confidence was found for those who rejected the lineup (2.47) compared to both those who accurately identified the suspect (4.30) and those who chose a filler (3.31) if they had no rapport, did not go through PICR and were not steered. Additionally there was a decrease in confidence for those who rejected the lineup (2.52) compared to those who chose the suspect (3.71) if they had no rapport, went through PICR, and were steered. The other significant difference was a significant increase in confidence for suspect choosers (4.76) compared to both rejections of the lineup (2.91) and foil choosers (3.44) if they had established rapport, had gone through PICR and had not been steered.

Target Present PIF.

A MANOVA was run examining the PIF questions from Wells and Bradfield (1998; 1999) as a function of rapport, dichotomous steering, PICR, and category of choice. These questions are things that are often asked of witnesses either in the course of the investigation or become relevant at trial, so changes in responses to these questions are important to understand what these variables are doing to the overall system. These metacognitive questions may differ between target present lineups and target present lineups as the process of choosing is different between these two types.

Rapport did not significantly affect any of the questions, $ps > .162$. PICR did not significantly affect any of the questions, $ps > .125$. Steering significantly affected rating of ease of choice, $F(1, 1097) = 4.86, p = .028$ and time to choose, $F(1, 1097) = 21.91, p < .001$. Participants who received steering rated the process of choosing as significantly easier (5.50) compared to those who did not receive steering (5.33). Participants who received steering also rated the

length of time to choose as longer (3.93) compared to those who did not receive steering (3.53). The category of choice significantly affected goodness of view, $F(2, 1097)=16.54, p<.001$; ability to pick out specific features, $F(2, 1097)=11.85, p<.001$; the amount of attention paid to the face, $F(2, 1097)=5.53, p=.004$; the basis for identification, $F(2, 1097)=18.30, p<.001$; the ease of choice, $F(2, 1097)=19.27, p<.001$; the time to choose, $F(2, 1097)=8.27, p<.001$; their willingness to testify, $F(2, 1097)=7.46, p=.001$; their general memory ability, $F(2, 1097)=4.02, p=.018$; their memory of the suspect, $F(2, 1097)=20.41, p<.001$; and their method of choice, $F(2, 1097)=16.02, p<.001$. Tukey's post hoc tests were used for all comparisons of category of choice. Those who rejected the lineup thought they had significantly worse (3.06) view of the crime than those who made an suspect identification (3.89) or filler identification (3.57), were significantly less (2.74) able to make out the specific features of the face than those who made an suspect identification (3.33) or filler identification (3.06), paid significantly less (3.29) attention to the crime than those who made a suspect identification (3.71), had significantly less (2.55) basis for identification than those who made an suspect identification (3.29) or filler identification (3.03), found the choice to be significantly harder (5.85) than those who made an suspect identification (5.10) or filler identification (5.35), thought they took significantly more (3.98) time to choose than those who made an suspect identification (3.43) or filler identification (3.69), were significantly less (1.73) willing to testify than those who made an suspect identification (2.16) or filler identification (1.90), had significantly poorer memory for the suspect (2.36) than those who made an suspect identification (3.12) or filler identification (2.81), and were significantly more likely (3.17) to say their method process of elimination rather than one figure popping out at them than those who made an suspect identification (4.13) or filler identification (3.95), which hovered around the midpoint of the scale suggesting a mix of process

of elimination and the answer popping out at them. Those that made a suspect identification thought they had a significantly better (3.89) view of the crime than those who made a filler identification (3.57), were significantly better (3.33) able to make out specific features than those who made a filler identification (3.06), paid significantly more (3.71) attention to the face than those who made a filler identification (3.35), had significantly more (3.29) basis for their identification than those who made a filler identification (3.03), found it significantly easier (5.10) to make their choice than those who made a filler identification (5.35), thought they took significantly less (3.43) time to make their choice than those who made a filler identification (3.69), were significantly more (2.16) willing to testify than those who made a filler identification (1.90), thought they had significantly better (4.19) general memory ability than those who made a filler identification (3.81), and had significantly better (3.12) memory of the suspect than those who made a filler identification (2.81).

The first identified interaction was rapport and steering behaviors for general memory ability, $F(1, 1097)=4.29, p=.039$. Those with no rapport and did experience steering thought they had a better general memory (4.13) than those in the other conditions (>3.84). Additionally PICR and choosing category for distance from the crime was significant, $F(2, 1097)=3.16, p=.043$. Those who went through PICR and rejected the lineup thought they were further (3.59) from the crime than those who did not go through PICR and rejected the lineup (3.24). Steering and category of choice interacted for distance from crime, $F(2, 1097)=3.07, p=.047$. Those who chose a known filler and experienced steering thought they were further (3.60) from the crime than those who chose a known filler and did not experience steering (3.41) which was contrary to the pattern for the other choosing categories. The interaction between the four variables was significant for the ability to make out specific features of the suspect's face, $F(2, 1097)=4.50,$

$p=.011$. Tukey's post hoc found that for those in no rapport, no PICR, no steering, people who correctly identified the suspect were significantly more (3.67) able to make out specific features than those who made a rejection (2.42) or a filler identification (2.91). Additionally for those who had developed rapport, did not have PICR, did experience steering, those that rejected the lineup reported significantly poorer (2.32) ability to make out specific features than those who correctly identified the suspect (3.29) or who identified a foil (3.15). For those who had developed rapport, underwent PICR and did not undergo steering, those who rejected the lineup reported significantly poorer (2.55) ability to make out specific features than those who correctly identified the suspect (3.65).

Interactions that approached significance included PICR and choosing category for basis of identification, $F(2, 1097)=2.39, p=.092$. Steering interacting with choice category was also marginally significant, $F(2, 1097)=2.65, p=.071$. Rapport, PICR, and steering had a marginal interaction for basis for identification, $F(1, 1097)=3.25, p=.072$. The interaction between the four variables were marginally significant for exposure time, $F(2, 1097)=2.32, p=.099$, and willingness to testify, $F(2, 1097)=2.38, p=.093$.

Target Absent Confidence.

An ANOVA was run examining the effects of rapport, PICR, steering occurring, and the type of choice made (rejection, designated suspect choice, filler choice) on confidence. Two significant main effects emerged, steering occurring, $F(1, 1088)=4.55, p=.033$, and the type of choice made, $F(2, 1088)=7.82, p<.001$. Confidence was higher for those that did not experience steering (3.42) than those who did (3.22). Tukey's post hoc tests found that those that rejected the lineups, therefore making the correct choice, were significantly less confident (2.92) than either those that chose the designated suspect (3.34) or who chose a filler (3.42). The interaction

between rapport and type of choice was marginally significant, $F(2, 1088)=2.66, p=.070$. No other analysis was significant and all means and standard deviations are available in Table 2..

Target Absent PIF.

Similar to the target present data, a MANOVA was run for the target absent PIF question data. Rapport did not significantly affect any questions, $p>.227$. PICR significantly affected memory for the suspect, $F(1, 1088)= 6.60, p=.010$, and marginally affected ease of choice, $F(1, 1088)= 3.63, p=.057$. Those who went through PICR reported a better memory of the suspect (2.88) than those that did not (2.67). Steering significantly affected the time to choose, $F(1, 1088)= 7.08, p=.008$, and marginally affected their method of choice, $F(1, 1088)= 3.56, p=.060$. Those who experienced steering reported taking longer (3.87) to make a choice than those who did not undergo steering (3.53). The category of choice significantly affected the ability to make out specific features, $F(2, 1088)= 3.58, p=.028$; basis for identification, $F(2, 1088)= 11.34, p<.001$; ease of choice, $F(2, 1088)=5.57, p=.004$; willingness to testify, $F(2, 1088)=5.15, p=.006$; memory of the suspect, $F(2, 1088)=3.54, p=.029$; and the method of choice, $F(2, 1088)=8.49, p<.001$. Those who rejected the lineup reported significantly worse (2.76) ability to pick out specific features than those who chose a filler (3.08), had significantly less (2.66) basis for identification than either designated suspect choosers (3.02) or fillers (3.15), reported significantly more difficult (5.60) decision processes than either designated suspect choosers (5.21) or fillers (5.25), were significantly less (1.69) willing to testify than filler choosers (2.02), reported significantly poorer (2.55) memory of the suspect than filler choosers (2.83), and reported a significantly different (3.40) method of choosing than either designated suspect choosers (4.04) or filler choosers (4.01). It also approached significance for attention paid to the

face, $F(2, 1088)=2.54, p=.079$, and the time they thought it took them to choose, $F(2, 1088)=2.41, p=.091$.

Rapport and steering interacted significantly for the memory of the suspect, $F(1, 1088)=6.05, p=.014$. There was a cross-over effect. Participants who developed rapport and liked the experimenter reported a decrease in memory compared to those who did not experience steering, but those who did not have rapport and experienced steering reported an increase in memory. PICR and category of choice had a significant interaction for ease of choosing from the lineup, $F(2, 1088)=5.25, p=.005$. Those who did not go through PICR and chose the designated suspect reported a more difficult choice (4.88) than either rejectors (5.49) or filler choosers (5.34). Additionally those who did go through PICR and rejected the lineup, reported a significantly easier (5.71) decision than those who chose a filler (5.16). Rapport, PICR, and steering interacted for attention paid, $F(1, 1088)=5.41, p=.020$. For those who developed rapport and did not experience steering, going through PICR led to a decrease in reported amount of attention. For the other categories there was either an increase reported a miniscule change in reports (.03-.05). There was significant four way interaction for time to choose $F(2, 1088)=3.49, p=.031$. Those who rejected the lineup, had rapport, did not experience steering and did go through PICR reported a longer time to choose (3.93) as did those who developed rapport, rejected the lineup, experienced steering and did not go through PICR (4.21) than the other positive rapport conditions (>3.76).

There were a number of marginally significant interactions as well. Rapport and PICR were marginally significant for the participants' general memory ability, $F(1, 1088)=3.83, p=.051$. Rapport and steering had a marginal interaction for basis for identification, $F(1, 1088)=2.81, p=.094$. PICR and category of choice had two marginal interactions: exposure time,

$F(2, 1088)=2.73, p=.066$, and distance from the crime, $F(2, 1088)=2.89, p=.056$. Rapport, PICR, and steering had a marginal interaction for memory of the suspect, $F(1, 1088)=2.93, p=.087$. Rapport, PICR, and category of choice had a marginal interaction for general memory ability, $F(2, 1088)=2.35, p=.096$. There was also a marginally significant four way interaction for the basis for identification, $F(2, 1088)=2.77, p=.063$. No other interactions were significant or below .1.

Discussion

In this study, I attempted to better understand both the interaction between two ecologically relevant elements of the lineup choosing task, rapport building and steering toward a designated suspect and the use of a novel technique intended to make confidence more diagnostic of accuracy in a lineup situation. As a reminder, I approached this study with the following five hypotheses:

H1. Rapport building will increase choosing rates and increase confidence due to wanting to comply with a positive authority figure.

H2. Steering will increase choosing for the designated suspect. There will likely be an increase in overall choosing rate (Clark et al., 2013; Rhead et al., 2015), but the pattern of the increase is a little less understood. Clark et al. (2013) found that the discriminability of choosing is actually helped by steering, meaning that the guilty subject is chosen at a higher rate and fillers for the innocent suspect are chosen at a higher rate in the steering conditions. Rhead et al. (2015) found an increase in choosing of suspects.

H3. There will be a significant interaction between steering and rapport building with those experiencing both giving the highest number of correct suspect identifications in target

present lineups and the highest number of incorrect suspect identifications in target absent lineups.

H4. Post-identification context reinstatement will differentially affect correct choosers and incorrect choosers with correct choosers showing a larger increase in confidence than incorrect choosers showing a decrease.

H5. The highest level of confidence will be in correct choosers who went through rapport building, steering, but not post-identification context reinstatement, as I expect this to allow them to recognize the external effects that may have affected their cognition.

Clark et al. (2013) set forth a list of several behaviors deemed indicative of undue influence on a participant to make a choice and, particularly, a designated choice. My research provides a better understanding regarding steering in general, as well as both the amount of steering and which behaviors might be most important. By using logistic regressions, I was able to understand the impact of steering, both individually and coupled with rapport, and tease apart the effects of steering. Rapport, regardless of if measured dichotomously as positive or neutral or if measured as a continuous self-report measure, never was predictive of choosing of the suspect or general choosing in either lineup. Steering did not have this pattern. Steering when measured as a dichotomous variable (did any steering behavior occur and with greatest similarity to the Clark et al. article) was not a significant predictor of suspect choosing for either target present or target absent lineups. The amount of steering behaviors (0-6) was not significant for the target present lineups. It was significantly predictive of suspect choosing for target absent lineups with each increase in steering behavior the odds of choosing the designated innocent suspect increased 1.18 times. The inclusive model with rapport was significant, as well as the model when including the interaction term, although the interaction block itself was not

predictive of suspect choosing. When looking at the individual steering behaviors, the block of steering behaviors was significant for target present lineups as well as the model, but it seemed driven almost purely by the steering behavior of “drawing attention to the suspect”. For target absent the behavior was significant as a block, and again approached for the model. This seemed to be driven again by the “drawing attention to the suspect” steering behavior. Finally we looked at the self-reported feelings of rapport and pressure to choose. Pressure to choose did not significantly predict choosing of the suspect in either target present or target absent lineups. Given the differential effects across lineup type, it does seem like the steering matters more in target absent lineups rather than in target present lineups to get the participant to choose the suspect.

Steering could lead to choosing of the guilty or innocent suspect if there were increasing steering behaviors or if “drawing attention to the suspect” was used as a steering behavior, but there is the question of what steering does to the overall choosing rate. For target present lineups, dichotomous steering did not lead to an increase in overall choosing. Dichotomous steering did approach significance for target absent lineups, but failed to reach significance in the model. Similar to suspect choosing, the amount of steering did not predict overall choosing in target present lineups, but was significantly predictive of overall choosing as a block and the model with the inclusion of rapport approaching significance. For every increase in number of steering behaviors, the likelihood of choosing anyone from the lineup increase 1.14 times. When examining the individual steering behaviors, the block of behaviors approached significance for target present lineups, but participants who were given the “is similar to or is the suspect” were 3.12 more likely to choose someone from the lineup. For target absent both the block and the model became significant when including the type of steering behaviors used. Using the “similar

to or is the suspect” with target absent lineups made it 5.41 times more likely the participant would choose from the lineup. Similar to above, the self-reported amount of pressure to choose from the lineup also significantly predicted overall choosing from the lineup for both target present and target absent lineups. Again steering seemed to be more important in getting participants given a target absent lineup to make a choice. Given the high predictive value of asking if a non-definitive choice “is similar to or is the suspect”, it seems this behavior may not actually be steering participants toward a particular suspect (given it’s lack of predictive value for suspect choosing), but instead might be getting participants to commit to their non-definitive choice. Unfortunately no record was kept regarding non-definitive choices.

I also wanted to explore how feelings about police and adherence to authority might influence steering or predict choosing. Regardless of target presence, neither feelings about police nor the RWA scale predicted suspect choosing. For overall choosing again there was no significant effect or interaction for either feelings about police or the RWA scale. One obvious confound with the police scale is that the participants were given lineups by research assistants. While many people associate lineups with the police, it is possible that having an actual officer give the participants the lineup could change the predictive value.

Based on the findings across both suspect choosing and overall choosing, some conclusions can be made. The first is that positive or neutral rapport does not matter when participants are choosing from a lineup. Neither the variable itself, nor any interaction between rapport and steering achieved significance. My initial hypothesis was that rapport would make steering more effective. Instead it seems to have absolutely no influence on the effect of steering. Steering does seem to matter both for suspect choosing and for overall choosing from a lineup, although this effect seems stronger in the target absent lineup compared to the target

present lineup. Additionally some critiques to Clark et al.'s (2013) steering behaviors can be levied. The only behavior that was significantly predictive of choosing of the suspect, the whole intent behind steering, was "drawing attention to the suspect" across both lineup types. The only behavior that significantly predicted overall choosing was the "is similar or is the suspect" behavior. Admittedly this behavior occurred less often than a behavior like being told to take your time as can be seen in Table 3. Take your time was a fairly common behavior. "Similar to or is" was a fairly uncommon procedure. Given that this behavior was not significant for the choosing of the suspect, it suggests this behavior might actually be doing the opposite of its intention and rather than making the participant second guess their non-definitive choice may be making them commit to it. This will need to be tested in future research to be sure as no record of the non-definitive choice was kept.

With regard to confidence in the participants' decision making processes, additional interesting findings were discovered. For target present confidence, there were two main effects. Steering significantly decreased confidence. Additionally, those who made the correct choice and selected the suspect were significantly more confident than either filler choosers or rejectors. In terms of the justice system, this is exactly what should happen. For target absent lineups, again the only main effects that mattered were steering and type of choice. Steering again decreased confidence. Those who rejected the lineup, and therefore made the correct choice, were significantly less confident than either those who chose the designated suspect or a filler. While this is somewhat troubling as a correct decision is being given a low level of confidence, it is typical for rejectors of a lineup to show a low level of confidence. Only one interaction achieved significance. It included all the independent variables. Similar to a previous study, the only time PICR significantly changed confidence was for correct choosers. Additionally, it only

inflated confidence when it was combined with rapport and no steering. This suggests rapport may be important for the use of PICR. Rapport is already being used during most police/witness interactions (e.g. Vallano et al., 2015). It also makes sense that people would reap the benefits of PICR most when the person leading them through the process was someone they liked and trusted. One of the first parts of PICR asks them to close their eyes and that could be a very uncomfortable experience with a complete stranger or someone who had not made you feel initially comfortable. The more interesting aspect of this interaction though is the importance of steering. My initial hypothesis was that PICR would lead participants to give a higher rating of confidence if they had been steered as they were receiving feedback as to the choice they should make and that should provide evidence toward their confidence in their choice. Instead it seems that PICR may be instead cuing them to the influence of the administrator in guiding them toward a decision. This would be beneficial in an eyewitness sphere as it would bolster accurate choosers who participated in a less biasing lineup procedure, without bolstering either accurate choosers who had external influence or inaccurate choosers. It seems like PICR can be a useful investigative tool that is targeting correct choosers who did not have outside influence in their decision making process.

While confidence is arguably the most important investigative report a witness can give post-identification, there are other variables that can be of interest both to the investigation and at later trial. Rapport did not significantly affect any of the post-identification questions for either target present or target absent crimes. While PICR did significantly affect any questions for target present lineups, it did cause an increase in reported memory of the suspect for target absent lineups. While this is not a good outcome for justice, it did not lead to an increase in confidence. Steering affect ratings of ease only for target present lineups with those

experiencing steering reporting an easier decision than those who did not and time to choose for both target absent and target present lineups with those experiencing steering reporting that it took them longer to make a decision. This is likely true as two of the steering behaviors rely on a duration passing without the participant choosing and if there was steering there would be a back and forth between the participant and research assistant. Time data was collected, but was open to a large amount of human error given that the participant had to retrieve the research assistant from the hall in the no steering condition. The type of choice led to the largest number of differences in these questions. They are largely in the direction one would expect with those rejecting showing the lowest ratings of metacognition and memory.

There were some interactions as well for the metacognitive questions. For target present lineups, PICR and the choice category interacted with those who rejected the lineup and did not go through PICR reporting the lowest distance for crime. This is somewhat strange given that a closer distance should mean a better memory which should make it easier to identify the guilty suspect. Distance was also affected by an interaction between steering and the category of choice. Contrary to the rejectors and correct choosers, incorrect choosers who went through steering reported being further from the crime. Additionally, steering and rapport interacted for both lineup types with those in the no rapport, who encountered steering reporting significantly better memory than any other condition. While these reports were significantly different according to statistical testing, the raw numbers were not very different and may not have a large impact on the investigation given the tangential connection to identification. The target absent lineup, however, did have a two-way interaction that is more investigatively relevant. Specifically, PICR and category of choice interacted for ease of choosing. Those who went through PICR and made the correct choice reported an easier decision-making process compared

to those who chose a filler. This is an ecologically good finding as the people who make the right decision should hopefully have an easier process. Additionally, those who did not go through PICR and chose the designated innocent suspect reported a more difficult choice than the other two choice categories. There was, however, a four way interaction for the target present lineup for memory of the suspect, which is arguably one of the more important metacognitive questions for an identification procedure. This was largely driven by an increase in memory for specific features for participants who rejected the lineup, developed rapport, did not go through PICR, and did not receive steering and an increase in memory for those who correctly identified the suspect, but did not experience any of the manipulations. Finally developing rapport, going through PICR, and not experiencing steering led to significantly lower reported ability in comparison to correct choosers. A possible explanation for the initial result is that those who rejected the lineup but liked the experimenter may have wanted to seem like they had cause to reject the lineup. The second finding is likely largely due to pristine conditions causing absolutely no influence on the witness. The final finding again suggests that PICR might be most useful when rapport has been developed and the conditions are non-biasing.

Implications

The variables presented here have been examined in the literature in before and policies have been put in place based on those findings. This literature, while helpful in understanding some of the effects on the justice system, is incomplete. Previous work has focused on how variables like rapport and context reinstatement for the event can affect witness memory. This research extends the literature by applying it to an equally important aspect of witnesses in the system, their meta-cognition and changes in their response criterion.

Rapport has long been heralded as key element in making witnesses feel comfortable after an event and has been shown to affect memory, in both positive (an increase in details reported) and negative (an increase in confabulations) ways. This is the first known research to examine the effects of rapport on both choosing behavior and metacognitive reports. Happily for the justice system, rapport does not seem to influence either. This finding is both novel and important. It is critical to examine the effects of tools used in interviews and as part of an investigation for unexpected or unintentional influencing of a witness, including potentially long-lasting effects. Anything that research or intuition suggests might affect a witness's memory but also be examined to see if it affects any other aspect of a witness's involvement. A slight limitation to the finding of no effect is that the rapport developed between a research assistant and a participant is likely different than the rapport developed between an officer and a witness for two reasons. Firstly, there is a stronger power differential between an officer and a witness than between a research assistant and a participant. That power differential may come into play with relation to rapport on the variables studied here. Secondly, the time spent building rapport and the time spent with a witness is likely longer in an investigation than in an approximately 45 minute session here. Neither of these limitations can be easily addressed in the lab unfortunately, so the experiment presented here attempts to create a reasonable correlate.

Guidelines for police have long suggested using blinded administrators for lineups. For just as long, there has been resistance and reluctance for this to be fully implemented. Steering, or guiding participants toward an intended choice, has been found to affect choosing behavior in participants in previous studies. By adopting the methodology of Clark et al. (2013), not only was it simpler to make a comparison between previous research using new variables and interactions, but a critique of the paradigm is also possible. Using logistic regression, it seems

that the behaviors used in the previous research may be too liberal. Truly only two behaviors of the six listed mattered when examining both choosing of the suspect and choosing from the lineup. “Drawing attention to the suspect” naturally increased suspect choosing. Asking if a nondefinitive foil choice “was the suspect or was similar to the suspect” may have had the opposite intention from steering. This behavior did predict choosing from the lineup, but did not predict suspect choosing. Unfortunately, the foresight to record these nondefinitive choices was not present, so the data is not able to determine if this led to participants making a more definitive choice of their initial foil, but that is a hypothesis that could be tested in the future.

When speaking about the effects of steering on choosing, it is important to note that there were rather low choosing rates in comparison to other studies. There are three possible explanations for this occurrence. Firstly, there was a slightly longer delay between witnessing of material and choosing from the lineup. While it is not unheard of to have a 15 minute delay, with the participant thinking about other things, this time for degradation of memory may have contributed to a lower choosing rate. Secondly, the environment of watching the crime video may have contributed. The research assistant was not in the room to ensure that adequate attention was given to the video. While not ideal, this was a necessary element to ensure that the research assistants did not become aware of the within-subjects variable. It is possible that the participants checked their phones or otherwise failed to attend to the video. Additionally, unlike with much other lineup research, the video included two suspects, potentially increasing the cognitive load and affecting the ability to properly encode the faces of both thieves. Previous research has found that viewing multiple perpetrators can make it more difficult to make an accurate lineup choice (Bindemann, Sandford, Gillatt, Avetisyan, & Megreya, 2012).

Post-identification context reinstatement continues to show promising effects, as well as a better understanding of the mechanisms necessary for it to be successful. Specifically it seems that PICR require rapport to be successful. While not instructed to, it seems likely that the assistants from previous studies did develop some measure of rapport with participants. Assistants in this study informally reported the difficulty and negative affect they experienced in attempting to develop no rapport with the participants. Rapport seems to be a naturally occurring element in studies and so was likely, although not definitively, present in the previous studies that found support for PICR. Additionally, there is supportive evidence of the effect continuing to differentially support only correct choosers. This is a critical finding for the justice system. Anything that can be done to increase correct choosers without artificially increased incorrect choosers is a positive finding for justice. There was a second benefit to PICR, however. The only correct choosers that had a boost in confidence were those that did not experience steering. This implies that PICR allowed correct choosers to recognize the potential for outside influence that the administrator created. This is an important finding in the PICR literature. Previous studies that used post-identification feedback did not find a difference between positive feedback and neutral feedback with PICR. While more research needs to be done to fully understand the differential effects shown between these studies, it seems like what may be occurring is the opposite of what was predicted in this study. The prediction was that participants who experienced PICR would utilize the steering cues to make themselves more confident in their choice, functionally using it as supportive evidence. Instead, participants seem to be recognizing the explicit influence that the administrator is exerting and downjusting their confidence appropriately. Again this is a positive finding for the justice system as witnesses who are being influenced by something outside of their memory for the crime should adjust their confidence

downward. Given the newness of PICR, more research is still needed, but it continues to show potential as an investigative technique.

One potential qualifier to this recommendation of PICR is that so far there has not been a control that has just asked the participants to think about their experience in a less formalized way. It is possible that the context reinstatement does not need to be as guided or structured but rather just asking the participant/witness to think about their experience could elicit similar gains. This seems like an avenue for future research and consideration.

Conclusions

This research provided a more well-rounded understanding to several variables relevant to the justice system. It examined variables in conjunction and using dependent variables that, while germane, have not been fully examined in the complex environment in which they exist. While it is not pragmatically possible to examine them in a perfect correlate to the environment that would naturally occur, this study still extended the current research in a way that had not been done before.

This study strongly suggests that building rapport with a witness has no negative effects either in choosing behavior or in metacognitive reports. This is a positive finding for current police procedures as most police report attempting to build rapport with witnesses and find it to be an important investigative tool (e.g., Vallano et al., 2015).

Steering continues to be shown to be a negative behavior in the search for truth and justice. Steering, as measured in a number of ways, was the single predictor that influenced the decision process of the participant for both target present and target absent lineups. The effect was found more strongly in target absent lineups, which is arguably the most problematic area for there to be an effect. Additionally, it was found that the way steering has been

conceptualized in previous research may be overgeneralizing the influencing behaviors. The only two behaviors found to make any difference in choosing either of the suspect or in general was “drawing attention to the suspect” or asking if a non-definitive choice “was the suspect or was similar to the suspect.” Finally, a better level of understanding was achieved regarding the effects of these experimentally labeled steering behaviors. While “drawing attention to the suspect” did lead to increased suspect choosing, asking if a non-definitive choice “was the suspect or similar to the suspect” did not lead to increased suspect choosing, but did lead to an increase in overall choosing behavior. More research is needed to understand the effects of these behaviors in isolation as well as in conjunction with other forensically relevant variables.

The novel technique that I invented, PICR, has continued to show a positive effect for correct choosers in relation to confidence. Those who went through PICR in the more pristine conditions did experience a unique increase in confidence that was not shared by either incorrect choosers in more pristine conditions or correct choosers in non-pristine conditions. Additionally, it seems like rapport building may be an important element in successfully utilizing this technique. Given that a benefit was only found in the area where the justice system would want a benefit, it suggests that there is no negative in applying this technique in eyewitness situations. More research should be done, but the technique continues to be promising.

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Tables

Table 1

Choosing Behaviors as a Function of Rapport and Steering Occurring

	Rapport / Steering Behaviors	Rapport / No Steering Behaviors	Low Rapport / Steering Behaviors	Low Rapport / No Steering Behaviors
Target Present Rejection	48	66	50	70
Target Present Suspect Selection	53	45	52	54
Target Present Filler Selection	160	218	142	213
Target Absent Rejection	54	73	44	78
Target Absent Suspect Selection	41	46	42	37
Target Absent Filler Selection	174	206	167	208

Note. Numbers are total counts of choosing behaviors and steering behaviors refers to at least one steering behavior occurring

Table 2

Confidence Reports by Condition

	Target Present			Target Absent		
No Rapport	Hit	Filler	Reject	Hit	Filler	Reject
No PICR						
No Steering	4.30 (1.27)	3.31 (1.70)	2.47 (1.62)	3.75 (1.54)	3.50 (1.51)	3.19 (1.90)
Steering	3.52 (1.34)	3.30 (1.59)	2.79 (1.79)	3.50 (1.72)	3.16 (1.52)	2.94 (1.39)
PICR						
No Steering	3.71 (1.60)	3.46 (1.64)	3.06 (1.98)	3.50 (1.66)	3.35 (1.66)	3.29 (2.09)
Steering	3.83 (1.44)	3.36 (1.69)	2.52 (1.59)	3.50 (1.79)	3.41 (1.53)	3.00 (1.70)
Rapport						
No PICR						
No Steering	3.91 (1.85)	3.14 (1.49)	3.22 (1.82)	3.71 (1.78)	3.45 (1.66)	3.00 (1.91)
Steering	3.90 (1.90)	3.14 (1.55)	2.68 (2.10)	3.07 (1.49)	3.48 (1.68)	2.11 (1.56)
PICR						
No Steering	4.76 (1.39)	3.44 (1.58)	2.91 (2.18)	3.05 (1.18)	3.75 (1.60)	2.97 (1.65)
Steering	3.67 (1.83)	3.29 (1.58)	2.83 (1.83)	3.08 (1.44)	3.26 (1.48)	2.83 (1.73)

Note. Numbers in parentheses are standard deviations

Table 3

Presence of Steering Behaviors in Cases Where Steering Occurred

Steering Behaviors	Percentage of Occurrence for Target Present Lineups	Percentage of Occurrence for Target Absent Lineups
Told to Take Time	73.23%	71.78%
Similar to or Is the Suspect	18.90%	15.75%
Draw Attention to the Suspect	27.95%	31.69%
Look Carefully	57.28%	53.70%
Does Anyone Look Similar	48.82%	47.25%
Witness Knows Who the Suspect is	6.50%	5.88%

Note. Percentages are based on the occurrence of the behavior out of the total number of lineups in which steering occurred.

Appendices

Appendix A: Faux Demographics and Rapport Script

Rapport is meant to be bidirectional, meaning as they tell you things you respond in kind, so for the rapport script each question should be followed up with some sort of supportive, affirmative response. You should share personal information with the participant in five of the questions, but offer supportive responses in the other questions as well.

Rapport:

So I'm going to need to get a little bit of additional information from you. Again all of this will be kept confidential and not used in conjunction with your name

When is your birthday?

Where are you from?

What year are you?

What is your major?

What is your hopeful future profession?

Do you have a job currently?

Do you have a romantic partner?

Do you have any pets?

Do you have any roommates currently?

No Rapport:

I need a little more information. All of this will be kept confidential and separate from your name.

Birthday?

State of Residence?

Year of Study?

Plan for employment after graduation?

Current Job?

Do you have a romantic partner?

Pets?

Roommates?

Appendix B: Steering Script

Steering

Sit where you are close enough to the witness they can easily see the picture you are showing them.

When the witness is looking at the suspects photo, have a soft smile.

If the witness definitively makes a choice, whether foil or suspect, accept it as a choice (It was #3)

If witness makes a mention, that is not a direct identification, of a foil: “Ok so you are saying this one *is* the person from the video or this one is *similar* to the person for the video”

If witness is trying to decide between foil and target: ask a question that draws attention to the suspect’s picture (what about suspect 3 is familiar to you)

If witness makes a tentative foil choice (Number four looks a lot like them), “Take your time, there’s no rush” or “Just look at all the photos carefully”

If the witness makes a suspect choice, but uses hedge words, accept it as a choice (I think it was #3 or I’m pretty sure it was #3)

If you need to, clarify that a choice was made.

If no choice was made within 12 seconds, instruct the witness to take their time

If no choice after 20 seconds, ask if any look similar and suggest that the witness knows who the suspect is

No Steering

Hand the participants the line up and instruct them to wait until you have left the room to begin looking at the lineup

Appendix C: Post-Identification Context Reinstatement Script

This is a very simple procedure, designed to help you remember what happened and how you felt while watching the video and choosing a suspect from the line up. I would like you to close your eyes and to try to clear your head of all thoughts. (pause) Try to blank everything else from your mind and to focus only on remembering your experience when watching the video and selecting the person from the line up. (pause) I would like you to try and picture yourself watching the video and then making a choice from the line up as if it were happening right now, right before your very eyes. (pause) Run through what happened as you were making the choice; try to replay the event in your head, as if it were a video that you are watching right now. (pause) What is happening? What does the scene or environment around you look like? (pause) Imagine you are back to the point where you watched the video, (pause) look around (pause) try to mentally note everything that you see, think about what you see and about what is happening within you. (pause) Imagine you are back to the point where you chose a suspect, (pause) look around (pause) try to mentally note everything that you see, think about what you see and about what is happening within you. Try and note what people are involved, and what they look like, (pause) what they are doing, what are you doing? (pause) What are you thinking? (pause) Think about the thought processes you went through when you were deciding which picture to choose (pause) Try to think back to the video. (pause) Think about everything you saw, noting every detail, no matter how small it may seem. (pause) Try to picture choosing a suspect as if you were still there, and seeing the event for the first time. (pause) Think about everything that you saw, noting every single detail, no matter how small it may seem. (pause) Think about everything you were thinking as you were deciding who to pick, even if it seems unimportant (pause) I would like you to keep picturing and remembering what you saw, remembering what

happened and replaying your decision process in your head as you answer the questions you will be asked. Think back to the video and lineup and replay those events in your head at any point when you need help remembering.

Appendix D: Post-Identification Survey

PIF Questions (repeated for both blonde and brunette lineups with either set of questions presented in a random order)

1. At the time you identified the person in the lineup, how confident were you that your identification was correct?
2. How good a view did you get of the subject in the video?
3. How long would you estimate that the suspect's face was visible in the video?
4. How well were you able to make out specific features of the suspect's face in the video?
5. How far away from the camera was the suspect?
6. How much attention were you paying to the suspect's face while viewing the video?
7. To what extent do you feel you had enough basis (enough information) to make an identification?
8. How easy or difficult was it for you to figure out which person in the photos was the person from the video?
9. After you were first shown the photos, how long do you estimate it took you to make an identification?
10. On the basis of your memory for the video, how willing would you be to testify in court that the person you identified was the person in the video?
11. Generally, how good is your recognition memory for the faces of strangers that you encountered on only one prior occasion?
12. How clear is the image you have in memory of the person you saw in the video?
13. When deciding which photo to pick did you use a process of elimination or did the photo you picked 'pop out' at you?

RAW Questions

1. What our country really needs instead of more “civil rights” is a good stiff dose of law and order
2. The days when women are submissive should belong strictly in the past. A “woman’s place” in society should be wherever she wants to be.
3. There is no such crime to justify capital punishment
4. Obedience and respect for authority are the most important values children should learn
5. What our country really needs is a strong, determined government that will crush the evil and set us on our right way again
6. It is good that nowadays young people have greater freedom “to make their own rules” and to protest against things they don’t like
7. It is important to protect the rights of radicals and deviants in all ways
8. The real keys to the “good life” are obedience, discipline, and virtue
9. How good a job do you think the police are doing?
10. Police can be relied on to be there when you need them
11. Police would treat you with respect if you had contact with them for any reason
12. Police are helpful
13. Police are friendly and approachable
14. Police respond to emergencies promptly
15. Police support victims and witnesses adequately

Rapport Manipulation Check Questions

1. My experimenter was:

- a. Smooth
- b. Bored
- c. Co-operative
- d. Satisfied
- e. Comfortable
- f. Awkward
- g. Engrossed
- h. Involved
- i. Friendly
- j. Active
- k. Positive

2. My interaction with my experimenter was:

- a. Well coordinated
- b. Boring
- c. Co-operative
- d. Harmonious
- e. Unsatisfying
- f. Uncomfortable
- g. Paced
- h. Cold
- i. Awkward
- j. Engrossing
- k. Unfocused

- l. Involving
- m. Intense
- n. Active
- o. Positive
- p. Dull
- q. Worthwhile

Steering Manipulation Check Questions

1. How much pressure did you feel to choose from the two lineups?
2. How much pressure did you feel to choose a specific suspect from the blonde lineup?
3. How much pressure did you feel to choose a specific suspect from the brunette lineup?

Appendix E: Letter of Research Compliance Approval



Office of Research Compliance
Institutional Review Board

March 10, 2017

MEMORANDUM

TO: Brittany Race
James Lampinen

FROM: Ro Windwalker
IRB Coordinator

RE: New Protocol Approval

IRB Protocol #: 17-02-503

Protocol Title: *Context Reinstatement and Delay on Eyewitness Metacognition*

Review Type: EXEMPT EXPEDITED FULL IRB

Approved Project Period: Start Date: 03/09/2017 Expiration Date: 03/08/2018

Your protocol has been approved by the IRB. Protocols are approved for a maximum period of one year. If you wish to continue the project past the approved project period (see above), you must submit a request, using the form *Continuing Review for IRB Approved Projects*, prior to the expiration date. This form is available from the IRB Coordinator or on the Research Compliance website (<https://vpred.uark.edu/units/rscp/index.php>). As a courtesy, you will be sent a reminder two months in advance of that date. However, failure to receive a reminder does not negate your obligation to make the request in sufficient time for review and approval. Federal regulations prohibit retroactive approval of continuation. Failure to receive approval to continue the project prior to the expiration date will result in Termination of the protocol approval. The IRB Coordinator can give you guidance on submission times.

This protocol has been approved for 3,000 participants. If you wish to make any modifications in the approved protocol, including enrolling more than this number, you must seek approval *prior* to implementing those changes. All modifications should be requested in writing (email is acceptable) and must provide sufficient detail to assess the impact of the change.

If you have questions or need any assistance from the IRB, please contact me at 109 MLKG Building, 5-2208, or irb@uark.edu.