How does Question Content Influence Guilty Suspects' Inferences about what the
Interviewer knows?

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QUESTION CONTENT AND SUSPECTS' INFERENCES

Abstract

The aim of this study was to understand how introducing a higher suspicion tone and specific crime-related details in the content of investigative questions influences inferences guilty suspects draw regarding prior information held by the interviewer. We tested three factors related to the specific content in questions namely *level of suspicion* (high and low suspicion), *level of specificity* (the amount of crime-related detail-*general* and *specific*) and *topic discussion* (whether a certain crime-related activity was discussed or not). We recruited $N=232$ participants who read a crime narrative and interview transcripts related to the crime. They assumed the role of the suspect in the narrative and responded to scales measuring their *perceived interviewer knowledge* (PIK) based on the interviews. We found that a specific crime-related topic, when discussed increased PIK. We also found that a topic discussed with specific crime-related details in the questions increased PIK. This study provides support for our findings from a previous study that was the first to test guilty suspects' inferences from a psycholinguistic perspective, and gives us a better understanding of the underlying mechanisms during police interviews.

Keywords: Perceived interviewer knowledge, pragmatic inferences, relevance theory, investigative question content, police interviews

QUESTION CONTENT AND SUSPECTS' INFERENCES

How does Question Content Influence Guilty Suspects' Inferences about what the Interviewer knows?

Imagine that you are an animal activist and stole some dogs, rabbits and monkeys from a cosmetic laboratory that were being used for testing. A few days later, a detective shows up at your door and says, "Some animals were stolen from a cosmetic lab around the corner a few days back. Do you happen to have any information regarding this?" You would infer from this question that the detective does not particularly know that *you* stole the animals and is only seeking information regarding this. If the detective instead said "What were you doing near the cosmetic lab around the corner from where animals were stolen some days back?" you would infer that the detective has some information placing you at the lab. However you might infer that the detective may not have specific information that point to you stealing the animals. Now imagine the detective said "A few dogs, rabbits and monkeys were stolen from the cosmetic lab around the corner some days back. Your activities near the cosmetic lab on that day make me believe that you stole them. What can you tell me about it?" This question could lead you to infer that the detective holds specific background information implying high suspicion regarding your involvement.

As a suspect, you might draw these specific inferences regarding what prior information the detective might already hold regarding your role in stealing the animals since they seem like the most obvious and effortless deductions (Sperber & Wilson, 1995). But what mechanisms underlie these inferences regarding how much prior information the detective might hold without the detective specifically stating this information? To understand this, we draw from a psycholinguistic theory namely *relevance theory* (Sperber & Wilson, 1995). Relevance theory is based on Paul Grice's (1975) theory on pragmatic inferences and logic of communication. Grice

QUESTION CONTENT AND SUSPECTS' INFERENCES

theorized that all communication is based on certain rules that imply that the communicated information is relevant. However, the idea behind what he meant by *relevant* was not clearly defined. Sperber and Wilson bridge this gap in their theory and clarify its role in drawing specific inferences from communicated information.

Why is it important for us to understand the inferences a suspect might draw regarding the detective's prior knowledge about the suspect's role in a crime? The inferences suspects draw about the detective or interviewer's prior knowledge or what we will refer to as *perceived interviewer knowledge (PIK)* has been posited as an important determinant of the suspect's behavior during investigative interviews (Granhag & Hartwig, 2015). Based on what they think the interviewer already knows about their role in crime, guilty suspects choose strategies to convince the interviewer of their innocence and decide what information they want to reveal or conceal during the interview (e.g. Hartwig, Granhag & Luke, 2014; Granhag et al, 2015; Granhag & Luke, 2018). However, most of the existing literature has studied perceived interviewer knowledge as an outcome of the interviewer disclosing evidence and stating the information they hold using different techniques during the interview (Hartwig et al., 2014; Granhag et al., 2015; Granhag, Strömwall, Willén & Hartwig, 2013).

In an earlier study (Srivatsav, Luke, Granhag & Vrij, 2019), we tested how the interviewer's question content could influence guilty suspects' perceived interviewer knowledge. We found that asking questions regarding a specific crime-related activity, irrespective of the crime-related details mentioned in the question seemed to increase the suspects' perceived interviewer knowledge. We wanted to test if the findings from our previous study regarding questioning about a specific activity (referred to as *topic discussion*) would be supported.

QUESTION CONTENT AND SUSPECTS' INFERENCES

We also proposed that guilty suspects draw inferences about the interviewer's prior knowledge from the content in the question as illustrated in the examples earlier and predict that (a) including more specific crime-related details in the questions would increase their perceived interviewer knowledge and (b) when the interviewer indicates higher suspicion during the interview, it will increase their perceived interviewer knowledge. These predictions are an outcome of the concepts of relevance theory, which will be discussed below.

Inferences from Questions: Relevance Theory

Sperber and Wilson (1995) proposed the *relevance theory* to understand how we draw inferences from communicated information. Specifically, the theory aims to explain how people draw inferences based on the “relevance” of the context and content. According to the theory, we draw inferences with an assumption that the simplest and the most informative interpretation of the communicated information is the correct one. This means that for the communicated information to be informative we make assumptions regarding all the other interpretations of the information that could be true in the context. For example, the Detective's question “What were you doing near the cosmetic lab around the corner from where a few animals were stolen some days back?”); this question does not contain any specific information about what the detective knows. But you derived inferences that the detective has information about your presence near the lab and also that animals were stolen from the lab, from what the detective stated by assuming that all those inferences must be true in order for the detective's statement to be informative.

Relevance theory states that the speaker's communicated information contains implicit information that the listener would understand allowing the listener to generate an appropriate response. When the speaker communicates, the listener tries

QUESTION CONTENT AND SUSPECTS' INFERENCES

to fill in all the information that needs to be true in order for the speaker's communication to be informative. For example, when the detective stated, "your activities near the cosmetic lab on that day make me believe that you stole them" you could infer that the detective holds some information that specifically points in your direction without the detective having stated this particular information to you. You make this inference since it is the most straightforward explanation based on the detective's statement (see Sperber & Wilson, 1995 for a complete account of relevance theory).

According to the theory, the relevance of the content of the questions in the context lead to a response that should also be relevant to someone who is present in the context. For example, when the detective asked what you were doing near the lab, the question offers you the cue that the response you provide is relevant to him. It also provides other relevant cues for you to know what kind of a response is relevant to him: Since he already holds some information regarding your presence, your response should add to what he already knows to be relevant (for a more thorough review of mechanisms related to questions in relevance theory, see Sperber & Wilson, 1988; Clark, 1991). In this case, you are likely to provide a response that explains your presence near the lab. Hence, what is relevant within the context is based on what information the speaker already holds and the specific information that the speaker requests from the listener (Sperber & Wilson, 1988; Jacobsen, 2010).

The more specific the information is within the question, it could imply more specific background knowledge regarding that information. For example, "A few dogs, rabbits and monkeys were stolen from the cosmetic lab around the corner some days back. Your activities near the cosmetic lab on that day make me believe that you stole them" could imply that the detective holds specific information regarding your

QUESTION CONTENT AND SUSPECTS' INFERENCES

activities. You may also infer that based on the information held by the detective, they seem highly suspicious of your involvement in the stealing. A response with more specific detail addressing the specific content of the detective's question would be considered as relevant to the detective (Sperber & Wilson, 1988; Clark, 1991, Sperber & Wilson, 1995). For instance, explaining your activities near the lab would be of more relevance within the context than trying to provide an alibi that you were not present near the lab since the detective already holds information about your presence.

The Present Study

From our theoretical understanding of inferences drawn from questions, we designed this study to test question content factors that could influence guilty suspects' inferences regarding how much prior crime-related knowledge interviewers have. As illustrated in the examples earlier, we tested how questioning about specific crime-related activity, including crime-related details within questions, and inducing suspicion within questions could influence the suspects' inferences. We refer to them as *topic discussion*, *level of specificity* and *level of suspicion* in the study.

As discussed earlier, we predicted that questioning about a specific activity would increase the suspect's perceived interviewer knowledge. We also predicted that higher crime-related detail within questions and higher suspicion levels would also increase the suspect's perceived interviewer knowledge.

The procedure, hypotheses and the analysis plan was preregistered on the Open Science Framework (OSF; osf.io/v485q) prior to data collection.

Method

Design

This study used a 2 (Level of Specificity- between subjects) x 2 (Level of Suspicion- between subjects) x 2 (Topic discussion: Discussed vs. Not Discussed – within subjects) mixed model design.

Independent Variables

We mainly tested two factors that could influence the suspect's perceptions.

They were:

Topic Discussion: whether or not the interviewer addressed the specific crime-related activity and asked questions about the topic.

Level of Specificity: Refers to the amount of crime-related detail that was included in the questions. Two levels of specificity were tested- (a) General- In this condition, the questions posed by the interviewer during the interview are broad and do not contain any specific crime-related activity details. (For example, "Were you at place X?") (b) Specific- In this condition, the questions posed by the interviewer during the interview contain specific crime-related activity details. For example, "Were you doing Y at place X?"

Level of Suspicion: Refers to whether the interviewer was suspicious regarding the suspect's involvement in the crime or not. Two levels of suspicion were tested- (a) Low Suspicion- In this condition, the interviewer's questions indicates low level of suspicion regarding the suspect's role in the crime (b) High Suspicion- in this condition, the interviewer's questions indicate a high level of suspicion regarding the suspect's role in the crime.

QUESTION CONTENT AND SUSPECTS' INFERENCES

Participants

We recruited $N = 250$ MTurkers. We excluded the data of 18 participants who failed an instructional manipulation check (IMC) and attention check questions included in the survey. For the IMC, participants had to read an irrelevant paragraph about a certain topic that ended with an instruction to ignore the content they read and respond with a plus sign. For the attention checks, participants answered simple factual questions regarding the content of the transcript they had read. We excluded data from participants who failed to respond correctly to 2 or more of these 3 attention questions. Our final sample included $N = 232$ participants (134 female, 97 male, 1 other; $M = 37.91$, $SD = 10.64$). An *a priori* power calculation indicated that this sample size is sufficient to detect an effect of $d = 0.18$ with 80% power.

Dependent Measures

We had one dependent measure: *Perception of Interviewer Knowledge (PIK)*. PIK refers to the amount of prior information the suspect thinks the interviewer holds regarding their role in crime and the activities the suspect carried out as part of the crime. We measured this by presenting the participants with a PIK scale that they rate based on their perception of the interviewer's prior knowledge. They assumed the role of the suspect and rated questions regarding the suspect's perception of how much prior knowledge the interviewer had about the suspect's role in crime (1 = Knows nothing, 10 = Knows everything).

Procedure

The study was administered online with the survey software Qualtrics. Participants completed a form consisting of basic demographic details such as their gender, age, education and ethnicity. This was followed by a brief description of the study and what their participation entails, and instructions.

QUESTION CONTENT AND SUSPECTS' INFERENCES

Participants read a crime narrative with the background story that placed them in the scenario of the crime. They were encouraged to immerse themselves into the role of the suspect. The narrative also consisted of activities the suspect carries out as part of the crime. The background story was about a revenge art theft that was carried out by the suspect in the house of the business partner. The suspect carried out all the activities related to the crime on the same evening of a party held in the house in three phases. The activities consisted of (a) retrieving a key to the bedroom of the business partner (b) disable a motion sensor alarm system by unlocking the business partner's phone, and (c) retrieving a plastic bag and rubber bands from the supply closet in the kitchen to secure the painting cut out from the frame. These activities were written such that they could be carried out in any order. We designed the activities in this way so that we could randomize the order of presentation between participants to reduce any potential order effects. They responded to attention check questions between these scripts.

After completing reading the crime narrative, the participants were asked to imagine that the police was questioning them. They read interview transcripts regarding the suspect's activities and the transcripts represented their interactions with the detective. The interview transcripts consisted of questioning related to the crime-related activities/topics, between the detective and the suspect. Every participant was presented with interview transcripts regarding all the activities the suspect carried out. The interview transcripts were presented after each topic, so a total of three interview transcripts were presented to each participant. Depending on the experimental group, participants received interview transcripts that contained interview questions in one of the two specificity and suspicion levels used in the study.

QUESTION CONTENT AND SUSPECTS' INFERENCES

After reading each part of the interview, the participants responded to the PIK scale. Participants were then directed to the debriefing page where they were informed about the premise of the study following which; the payment for their participation was released.

Hypotheses

In a previous study (Srivatsav, Luke, Granhag & Vrij, 2019), we found that talking about a specific topic of the crime in an interview, which we refer to as *topic discussion*, increased the suspects' PIK. We wanted to test if this finding will replicate in the present study. We had also tested varying levels of specificity in the previous study and we wanted to alter the way we had presented crime-related detail in questions in this study to test if that could influence suspects' inferences. An additional factor namely level of suspicion was also tested in this study. We made the following predictions:

1. We predict a main effect of the Level of Specificity on PIK in a way that suspects will have high PIK in the Specific condition compared to the General condition.
2. We expect a main effect of the level of suspicion on PIK such that suspects will have higher PIK in interviews with high suspicion compared to interviews with low suspicion.
3. We also predict a main effect for topic discussion where suspects will have higher PIK in topics discussed in comparison to topics not discussed in both general and specific conditions.
4. We expect an interaction between the level of suspicion and level of specificity in that interviews with high suspicion will increase PIK in specific condition compared to general condition.

QUESTION CONTENT AND SUSPECTS' INFERENCES

5. We also predict an interaction between the level of suspicion and level of specificity in a way that interviews with low suspicion will decrease PIK in the general condition compared to the specific condition.

Results

To test our specific hypotheses, we fit a linear mixed effects model with level of specificity, level of suspicion, topic discussion, and their interaction terms as fixed effects. We also included random intercepts for each subject (nested in the order in which the phases were presented) and for each of the three crime-related phases.

As predicted, we found a significant main effect of topic discussion on perceived interviewer knowledge such that suspects' inferences regarding interviewer's prior knowledge was higher about topics that were discussed in comparison to topics that were not discussed. We did not observe the predicted effects for level of specificity and suspicion. However, we found a significant interaction effect of level of specificity and topic discussion such that higher level of specific details on a crime-related topic discussed increased the suspect's perceived interviewer knowledge (see Figure 1 and Tables 1 and 2).

QUESTION CONTENT AND SUSPECTS' INFERENCES

Table 1

Mixed effects model: Perceived interviewer's knowledge as a function of level of specificity, level of suspicion and topic discussion

Fixed effects					
Term	<i>b</i>	<i>SE</i>	<i>df</i>	<i>t</i>	<i>p</i>
Intercept (General)	3.614	0.365	99	9.895	< .001
High Suspicion	0.303	0.465	302	0.653	0.51
Specific	0.008	0.468	302	0.018	0.98
Topic Discussed	0.668	0.192	1021	3.484	< .001
High Suspicion*Specific	-0.041	0.663	302	-0.062	0.95
Specific * Topic Discussed	0.578	0.256	1847	2.258	0.02
High Suspicion * Topic Discussed	0.172	0.253	1846	0.68	0.49
High Suspicion * Specific* Topic Discussed	0.169	0.362	1846	0.466	0.64
Random effects					
Term	SD				
Subject	2.25				
Order of topics discussed	0.14				
Topic	0.18				

Note: *t*-tests used Satterthwaite approximated degrees of freedom. Both factors use treatment contrasts. The reference group for *topic discussion* is topic discussed, level of specificity is general and level of suspicion is high suspicion.

Table 2

Descriptive statistics for perception of interviewer knowledge

Level of Specificity	Level of Suspicion	Topic Discussion	Mean	SD	SE	Observations
General	Low	Not Discussed	3.67	2.61	0.2	168
General	Low	Discussed	4.26	2.65	0.14	336
General	High	Not Discussed	3.98	2.78	0.2	186
General	High	Discussed	4.73	2.88	0.14	372
Specific	Low	Not Discussed	3.70	3.30	0.24	180
Specific	Low	Discussed	4.83	3.36	0.17	360
Specific	High	Not Discussed	3.95	3.01	0.23	162
Specific	High	Discussed	5.43	3.03	0.16	324

Note: Higher values indicate higher perceived interviewer knowledge (PIK).

QUESTION CONTENT AND SUSPECTS' INFERENCES

Figure 1

Means of PIK across *topic discussion*, *specificity* and *suspicion* conditions

Note: Each panel represents an effect of topic discussion, i.e., whether a crime-related topic is discussed or not across the specificity and suspicion conditions. The bars represent the increase in mean values across the specificity and suspicion conditions as a function of topic discussion.

Discussion

The present study was designed to test how varying the content of investigative questions would influence guilty suspects' perceived interviewer knowledge regarding their role in crime. Specifically, we tested three question content factors in the form of (a) specific activity being questioned about, (b) crime-related detail in the question, and (c) indicating different levels of suspicion regarding the suspects' involvement in the crime. We found that questioning about a specific activity increased guilty suspects' perceived interviewer knowledge.

The outcome of this study replicates our findings from our previous study (Srivatsav et al., 2019) where we had found support for topic discussion. Along with this, discussing about a specific activity with specific crime-related detail in comparison to broad questions seemed to increase their perceived interviewer knowledge. We suppose this could indicate that for a guilty suspect, when the line of questioning is in the direction of the specific activities carried out by the suspect, the amount of detail in the question might have some influence on their inferences. However, the effect of questioning about a specific activity seems to dominate the effects of specific crime-related content or suspicion indicated in the questions. This could imply that questioning about a certain topic implies some prior knowledge about the topic in comparison to when no question is asked about the topic.

Previous literature has indicated that guilty suspects revealed more information since they inferred higher background knowledge when the interviewer strategically disclosed evidence against the suspect; however, they inferred lower or no background knowledge when not confronted with evidence by the interviewer and withheld information (Tekin, Granhag, Strömwall, Vrij, & Hartwig, 2015; Tekin, Granhag, Strömwall, Vrij, 2016; Luke, Dawson, Hartwig, & Granhag, 2014).

QUESTION CONTENT AND SUSPECTS' INFERENCES

However, despite the small effect ($d = 0.14$), the findings from the present study seem to indicate that irrespective of the amount of specific crime-related information is disclosed, guilty suspects could infer some prior interviewer knowledge when questioned about a specific activity. This could imply that guilty suspects actively seek information regarding what the interviewer holds against them and that the overall context of being questioned about their activities influences what they infer the interviewer knows. This outcome strengthened by the findings from our previous study is an important consideration for an interviewer who might not hold a lot of specific crime-related information but can probably influence the suspect to perceive that the interviewer might hold more prior information.

Limitations and Future Directions

The study was conducted on an online platform that could have possibly reduced the level of motivation of the participants to actively be involved in the interviewing process. Even though we made sure that the procedure of the study checked for the attention they paid during the testing, we could not actively control for their motivation as a suspect during the study. However, since the study only required participants to make inferences from the content of the narrative without any decision-making leading to a consequence, we expect that this has not influenced the outcome of the study. It would be interesting to test these findings in a set-up that would resemble a real-life scenario and observe if that has an influence on the outcome.

The level of suspicion manipulation within the study was rather weak based on further analysis of the design. We included the manipulation only in the initial part of the interview transcripts and were not actively operated throughout the interviews. The weakness of the manipulation could possibly be the reason why our predictions

QUESTION CONTENT AND SUSPECTS' INFERENCES

regarding this condition were not supported. To strengthen the manipulation, we could have potentially included more obvious indications of suspicion throughout the questioning.

Conclusions

With the current study, we add to psycho-legal literature findings regarding how guilty suspects draw inferences from the content of questions about how much information the interviewer holds against them. Supported by the concepts of relevance theory, this study was the second attempt to explore guilty suspects' inferences from question content during police interviews from a psycholinguistic perspective. We have found support for our findings from our previous study that guilty suspects tend to draw inferences about the interviewer's prior knowledge more consistently from the context established and to an extent from the specific crime-related detail in the questions. The implication is that guilty suspects may infer some prior interviewer knowledge if the interviewer questions about an activity carried out by the suspect irrespective of how much specific information is revealed in the question. This study provides researchers a new theoretical direction on how guilty suspects assess questions and draw inferences actively during investigative interviewing.

References

- Clark, W. (1991). *Relevance theory and the semantics of non-declarative sentences*. Thesis (Ph. D.). University College London.
- Granhag, P. A., & Hartwig, M. (2015). The Strategic Use of Evidence (SUE) technique: A conceptual overview. In P. A. Granhag, A. Vrij, & B. Verschuere (Eds.), *Deception Detection: Current Challenges and new approaches* (pp. 231–251). New York, NY: John Wiley & Sons.
- Granhag, P. A., Strömwall, L. A., Willén, R. M., & Hartwig, M. (2013). Eliciting cues to deception by tactical disclosure of evidence: The first test of the evidence framing matrix. *Legal and Criminological Psychology*, 18, 341–355. doi: 10.1111/j.2044-8333.2012.02047.x
- Granhag, P. A., & Luke, T. J. (2018). How to Interview to Elicit Concealed Information: Introducing the Shift-of-Strategy (SoS) Approach. *Detecting Concealed Information and Deception*, 271-295. doi:10.1016/b978-0-12-812729-2.00012-4
- Grice, H. P. (1975). Logic and Conversation. In P. Cole, & J. L. Morgan. (Eds.), *Syntax and Semantics, Vol. 3, Speech Acts* (pp. 41-58). New York: Academic Press.
- Hartwig, M., Granhag, P. A., & Luke, T. (2014). Strategic Use of Evidence during investigative interviews: The state of the science. In D. C. Raskin, C. R. Honts, & J. C. Kircher (Eds.), *Credibility assessment: scientific research and applications* (pp. 1-36). Academic Press.
- Jacobssen, R. R. (2010). *The Interpretation of Indirect Speech Acts in Relevance Theory*. Denmark: Kolding.

QUESTION CONTENT AND SUSPECTS' INFERENCES

Sperber, D., & Wilson, D. (1986). *Relevance: Communication and Cognition* (2nd Ed, 1995) Oxford and Harvard University Press, Cambridge MA . Blackwell Publishing.

Wilson, D., Sperber, D. (2012). Mood and the analysis of non-declarative sentences. *Meaning and Relevance*, 210-229. doi:10.1017/cbo9781139028370.013