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# Verbal and Nonverbal Behaviour as a Basis for Credibility Attribution: The Impact of Task Involvement and Cognitive Capacity

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Abstract

Three experiments were able to demonstrate the usefulness of dual-process models for the understanding of the process of credibility attribution. According to the assumptions of dual-process models, only high task involvement and/or high cognitive capacity leads to intensive processing of verbal and nonverbal information when making credibility judgments. Under low task involvement and /or low cognitive capacity, people predominantly use nonverbal information for their credibility attribution. In Experiment 1, participants under low or high task involvement saw a film in which the nonverbal behaviour (fidgety vs. calm) and the verbal information (low versus high credibility) of a source were manipulated. As predicted, when task involvement was low, only the nonverbal behaviour influenced participants' credibility attribution. Participants with high task involvement also used the verbal information. In Experiment 2 and 3, the cognitive capacity of the participants was manipulated. Participants with high cognitive capacity, in contrast to those of low cognitive capacity, used the verbal information for their credibility attribution.

Keywords: credibility attribution, lie detection, dual-process theories, detection of deception, lay judgment

Verbal and Nonverbal Behaviour as a Basis for Credibility Attribution: The Impact of Task Involvement and Cognitive Capacity

Two major areas can be distinguished in research on deceptive communication. In the first, researchers try to isolate nonverbal and verbal correlates of deception. In several meta-analytic reviews, Zuckerman, DePaulo, and Rosenthal (1981), Zuckerman and Driver (1985), and DePaulo, Lindsay, Malone, Muhlenbruck, Charlton, and Cooper (2003) reported only a few nonverbal and verbal cues that are consistently associated with deception. In his review, Vrij (2000) also came to the conclusion that there is no typical characteristic behaviour by which liars could be distinguished from truth-tellers. The results of a meta-analytic review by DePaulo et al. (2003) showed that liars are less forthcoming than truth-tellers, tell less compelling tales, make a more negative impression, and are more tense. Cues of deception were more pronounced when people were motivated to succeed and when lies were about transgressions (DePaulo et al., 2003).

In the second area, researchers examine the question which cues are related to judgments about honesty and deceit. In several studies, lay persons and expert lie catchers (for example, police officers) were asked about their beliefs about cues associated with deception (Akehurst, Koehnken, Vrij, & Bull, 1996; Granhag, Andersson, Strömwall, & Hartwig, 2004; Hocking & Leather, 1980; Reinhard, Burghardt, Sporer, & Bursch, 2002; Strömwall & Granhag, 2003; Vrij & Taylor, 2003; Zuckerman, Koestner, & Driver, 1981; Koehnken, 1988). Akehurst et al. (1996), for example, found that laypersons associated deception with an increase of pauses, repetitions, and nervous facial expressions. Laypersons also believed that liars show more self-manipulating behaviours, hand and leg movements, and an overall nervous bodily expression. The content of a deceptive statement was believed to be characterized by less logical consistency, more superfluous details, and more spontaneous corrections. Several studies found that these beliefs about deception were highly correlated with credibility judgments (Apple, Streeter, & Krauss, 1979; Bond, Kahler, & Paolicelli, 1985; Kraut, 1978; Riggio & Friedman, 1983; Streeter, Krauss, Geller, Olson, & Apple, 1977; Zuckerman et al., 1981).

In general, it can be noted that only a few cues that lay persons associate with deception are actually related to deceptive behaviour. Hence, it is not surprising that the accuracy in detecting deception in many studies is rather low (with accuracy rates falling in the range of 45-60%; Koehnken, 1990; Vrij, 2000; Ekman & O'Sullivan, 1991). In a recent meta-analysis, Bond and DePaulo (2006) also found an accuracy rate of 54%. Koehnken (1990) concluded that most of the research on judgments about honesty and deceit has been concerned with detecting accuracy and not with the process of credibility attribution. As this situation has not much changed since Koehnken's review, the aim of this article is to apply the theoretical assumptions of dual-process theories (e.g. the elaboration likelihood model (ELM; Petty & Wegener, 1999) or the heuristic-systematic model (HSM; Chen & Chaiken, 1999)) to the field of credibility attribution.

*Dual-Process Theories*

In general, dual-process theories (for an overview, see Chaiken & Trope, 1999), differentiate two modes of information processing. The effortful mode (called central route in the ELM and systematic processing in the HSM) implies that individuals use all issue-relevant information, especially the content of a message, to develop or change an attitude. This process requires higher motivation and higher cognitive ability and capacity. Persons with lower motivation and/or lower cognitive ability/capacity use the effortless mode of processing (called peripheral route in the ELM and heuristic processing in the HSM). They use, for example, easy judgmental rules (heuristics) like “experts' statements can be trusted” or “consensus opinions are correct” to form their opinion. In general, the basic assumption of dual-process theories is that the amount of a person's motivation and capacity causes the intensity of information processing. Overall, dual-process theories have been well tested empirically (for an overview see Bohner & Waenke, 2002; Chaiken & Trope, 1999; Eagly & Chaiken, 1993; Petty & Wegener, 1999). Outside the persuasion context, dual-process theories have been developed, for example, to explain the process of person perception (Fiske & Neuberg, 1990; Fiske, Lin, & Neuberg, 1999), attitude-behaviour consistency (Fazio & Towles-Schwen, 1999), or the prediction of expectancies (Dickhaeuser & Reinhard, 2006).

We therefore argue that the basic assumption of dual-process theories could also be used to explain the process of credibility attribution.

There is some indirect support for the usefulness of the basic assumptions of dual-process theories in the field of deceptive communication research (Forrest and Feldman, 2000; Reinhard & Sporer, 2007; Stiff, Miller, Sleight, Mongeau, Garlick, & Rogan, 1989). For example, Stiff et al. (1989) argued that detectors use verbal information to make their credibility judgments only in familiar situations. In unfamiliar situations, people use cultural norms (heuristics) of what a liar ”looks like,” for example, the frequency of hand shrugs, to come to a decision. The results from Stiff et al. (1989) lend partial support to the situational familiarity hypothesis. As predicted, people in the familiar condition used only the verbal but not the nonverbal information to judge veracity. However, inconsistent with the assumptions, judgments of veracity in the unfamiliar condition were influenced significantly by the verbal and nonverbal behaviour.

Although some authors have argued that the basic assumptions of dual-process theories could be fruitfully used to explain the process of credibility attribution (Forrest & Feldman, 2000; Koehnken, 1990; Reinhard & Sporer, 2007; Stiff, Miller, Sleight, Mongeau, Garlick, & Rogan, 1989), these basic assumptions have so far not been directly tested in research on credibility attribution. To directly test the assumption that only high motivation/capacity leads to effortful processing of verbal information, it is necessary to manipulate verbal and nonverbal information independently. In the field of attitude research, the direct manipulation of the quality of content (arguments) and peripheral information is a common procedure to test whether people are engaged in peripheral/heuristic or central/systematic processing (e.g. Bohner, Rank, Reinhard, Einwiller, & Erb, 1998; Chaiken & Maheswaran, 1994). We therefore designed a videotaped conversation in which we orthogonally manipulated both verbal and nonverbal cues. This experimental procedure for directly manipulating verbal and nonverbal cues was also used in recent studies in research on credibility attribution (e.g. Freedman, Adam, Davey, & Koegl, 1996; Stiff, Miller, Sleight, Mongeau, Garlick, & Rogan, 1989). Although this procedure provides the opportunity to directly test whether people use verbal or nonverbal information for their credibility attribution, it does have limitations.

Actual judgements of truth and deception, which are commonly of interest in the field of deception research, could not be tested with this procedure. Actors show verbal and/or nonverbal cues to appear high or low in credibility, but they do not actually tell the truth or lie.

In line with the basic assumptions of dual-process models, we argue that people under high motivation use central/systematic processing and both verbal and nonverbal cue information for their credibility judgments. When peripheral/heuristic processing takes place, only nonverbal information will be used. The aim of the present study was to directly test the assumption that only high task involvement leads to effortful processing of verbal information when judging the credibility of a statement. In contrast, low task involvement should lead to heuristic peripheral/processing of nonverbal information when judging the credibility of a statement. Individuals in this condition should use easy judgemental rules like "liars are often nervous" when attributing credibility. In Experiment 1, we manipulated the task involvement for the credibility judgment, the verbal cue information, and the nonverbal cue information during the statement to test the assumption that high – but not low - involvement leads to the use of verbal and non-verbal information. We further assumed that participants under low involvement would process peripherally/heuristically and use primarily the nonverbal behaviour for their credibility judgements.

## Experiment 1

### *Method*

#### *Participants*

Eighty female and eighty male psychology students at the University of Giessen (mean age = 25.3) participated for departmental credit.

#### *Design*

The design was a 2 x 2 x 2 between-subjects design, with verbal information (truthful cues or deceptive cues), nonverbal information (truthful cues or deceptive cues), and participants' task involvement (low or high), with 20 participants randomly assigned to each of the 8 cells in the design. The sex of the participants was controlled.[1]

#### *Stimulus Material*

We created four parallel versions of a short film (about two minutes long) showing a conversation between a woman (Anna) looking for a successor to take over her current rental contract for her apartment and another woman (Maria) looking at the apartment for rent. The two women were amateur actresses who volunteered to participate in the film. The camera was set up in such a way that in each version of the film one could only see Anna, but hear both Anna's and Maria's voices.

*Verbal cue manipulation.* We manipulated the verbal information of Anna's statements about the apartment. Consistent with the findings of previous studies (Kraut, 1978; Stiff & Miller, 1986; Stiff et al., 1989), the truthful statements were manipulated so as to be judged more consistent and more plausible than the deceptive statements.[2]

*Nonverbal cue information.* In addition, we used three nonverbal cues - gaze aversion, adaptors, and posture shifts - to simulate truthful and deceptive nonverbal behaviour. Previous research found these cues to be related to lay persons' credibility judgments (Miller & Stiff, 1993; Stiff et al., 1989; Zuckerman & Driver, 1985; Zuckerman et al. 1981; Vrij, 2000). The actress displayed more gaze aversion, more adaptors, and more posture shifts when simulating deceptive nonverbal information.[3]

*Task involvement.* The involvement of the participants was manipulated via written instructions. In the high-involvement condition, participants were told that the study was very important for future psychological research. People were also told that their personal judgments were important for the success of the study. Participants in the low-involvement condition were told that the aim of the study was to obtain data for an introductory course in methods of psychology.

*Procedure*

The Experiment was labelled as a study dealing with lying in everyday life. Participants were told that they would watch a short film and then would be asked a few questions about it. Before watching the film, the motivation of the participants was measured with a questionnaire with four items (Cronbach’s *alpha* = .91). The film was introduced to the participants as follows:

> Now we will show you a typical everyday life situation: Anna is 26 years old and just finished her studies in business administration in Giessen. She lives in a one-room apartment in the inner city of Giessen. Two weeks ago Anna was offered a good job in a different city and she will start her new job next month. Looking for a successor to take over her current rental contract, she has an appointment with Maria, who is looking for an apartment. We will now show you a short film of the inspection of the apartment. Afterwards we will ask you some questions.

Participants watched one of the four stimulus films, which was presented on a 25-in colour monitor, and completed a brief questionnaire. At the end, participants were fully debriefed and asked not to discuss the study with others.

*Measures*

The credibility attribution was measured with five items each with a 9-point scale (“Anna was….. credible, honest, reliable, sincere, and truthful;” Cronbach's *alpha* = .97). The perception of the verbal cues were assessed with five items on a 9-point scale (“The verbal message of Anna was …..very plausible, consistent, coherent, structured, specific;” Cronbach's *alpha* = .81). The perception of the nonverbal cues were measured with five items on a 9-point scale (“Did Anna frequently hold eye-contact with Maria during the dialog?;” “How often did Anna look at Maria during the dialog?;” “How many body movements did Anna show during the dialog with Maria?;” “How often did Anna move during the dialog with Maria?;” “Did Anna handle with fidget objects during the dialog with Maria?;” Cronbach's *alpha* = .91).

*Results*

The data of the 160 participants were analyzed by separate 2 (involvement: low versus high) x 2 (verbal information: truthful cues or deceptive cues) x 2 (nonverbal information: truthful cues or deceptive cues) ANOVAs.

*Manipulation Checks*

*Task involvement.* The manipulation of task involvement was successful. As expected, participants in the high-involvement condition reported significantly higher importance of the task ($M = 5.99$, $SD = 1.47$) than did participants in the low-involvement condition ($M = 4.49$, $SD = 1.37$), $F(1, 152) = 43.30$, $p < .001$, eta-squared = 0.22. All other *F*s < 1.

*Verbal cues.* Participants evaluated the verbal information of the statements as significantly more plausible in the truthful cue ($M = 5.67$, $SD = 0.76$) than in the deceptive cue condition ($M = 4.24$, $SD = 1.68$), $F(1, 152) = 46.72$, $p < .001$, eta-squared = 0.24. All other *F*s < 1.

*Nonverbal cues.* As predicted, participants evaluated the overall behavior of Anna as significantly less believable in the deceptive cue ($M = 3.96$, $SD = 1.31$) than in the truthful cue ($M = 5.35$, $SD = 1.31$) nonverbal information condition, $F(1, 152) = 43.52$, $p < .001$, eta-squared = 0.22. All other *F*s < 1.

*Credibility attribution*

The five items measuring the credibility attributions showed a high reliability (Cronbach's *alpha* = .97) and were combined into a credibility index. The means of the credibility attributions for all eight conditions are displayed in Table 1. A significant main effect of nonverbal information emerged, $F(1, 152) = 54.64$, $p < .001$, eta-squared = 0.26. Participants gave higher credibility judgments in the truthful cue ($M = 5.66$, $SD = 1.36$) than in the deceptive cue ($M = 4.33$, $SD = 1.08$) nonverbal information condition. Participants under high motivation gave higher credibility ratings ($M = 5.33$, $SD = 1.41$) than participants under low motivation ($M = 4.65$, $SD = 1.30$), $F(1, 152) = 14.49$, $p < .001$, eta-squared = 0.09. Furthermore, there was a significant main effect of verbal information, $F(1, 152) = 10.04$, $p < .005$, eta-squared = 0.06 (truthful verbal cue condition: $M = 5.28$, $SD = 1.54$; deceptive verbal cue condition: $M = 4.71$, $SD = 1.17$).

The predicted interaction of involvement and verbal information (see Figure 1) was also significant, $F(1, 152) = 6.82$, $p < .05$, eta-squared = 0.04. Participants in the high-involvement condition gave higher credibility judgements in the truthful cue ($M = 5.85$, $SD = 1.45$) than in the deceptive cue verbal information condition ($M = 4.81$, $SD = 1.17$), $F(1, 152) = 16.70$, $p < .001$, eta-squared = 0.10. Participants in the low-involvement condition did not differentiate between truthful cue and deceptive cue verbal information, (*M*s = 4.70 and 4.60, *SD*s = 1.43 and 1.19, respectively), $F < 1$. No other effects became significant, all *F*s < 1.

*Discussion*

The manipulations of motivation, nonverbal cue and, verbal cue information were highly successful. Especially the manipulation of nonverbal cue information and verbal cue information produced equally strong effects on our manipulation checks.

The results were in line with our hypotheses, derived from dual-process theories, that participants' task involvement moderates the use of verbal cue information when attributing the credibility of a statement. Highly involved participants followed the central route (systematic processing) and relied on the verbal cue to judge the veracity of the statement. They used the consistency and plausibility of the statement to make a judgment. In contrast, low-motivated participants were not influenced by the consistency and plausibility of the verbal cues. They relied exclusively on the nonverbal cues to make their judgment. Independent of the task involvement, participants used the nonverbal cues for their credibility decision. In line with other findings (Miller & Stiff, 1993; Stiff et al. 1989; Zuckerman & Driver, 1985; Zuckerman et al., 1981; Vrij, 2000), participants judged the statement less credible when the source displayed gaze aversion, adaptors, and posture shifts. Dual-process theories argue that people with low task involvement use effortless ways to arrive at a judgment (Chen & Chaiken, 1999; Petty & Wegener, 1999). They rely on information that is relatively easy to use in forming credibility attributions, like nonverbal cues. The results of Experiment 1 support these theoretical assumptions.

According to dual-process theories, people with higher task involvement use a more extensive processing mode to obtain an accurate judgment. Attitude research inspired by dual-process theories often reports that people in the central/systematic processing mode use only verbal information (arguments) (Chen & Chaiken, 1999; Petty & Wegener, 1999). In our first experiment they used all available information, both nonverbal and verbal cues, to form their judgment. According to both the ELM and the HSM, the two processing modes (central/systematic and peripheral/heuristic processing) may co-occur (Chaiken & Maheswaran, 1994; Maheswaran & Chaiken, 1991; Maheswaran, Mackie, & Chaiken, 1992; Petty & Cacioppo, 1984; Petty & Wegener, 1999). In our data, the manipulation of verbal and nonverbal cues leads to independent additive effects for highly motivated participants.

If one favors the HSM, the additivity hypothesis postulates two independent effects of nonverbal and verbal information (e.g., Chaiken & Maheswaran, 1994). But the predictions were also in line with the basic assumption of the ELM that peripheral information can have an impact under low or high involvement (Petty & Wegener, 1999). For example, Petty and Cacioppo (1984) found that the attractiveness of a source in an advertisement for a beauty product had an impact under both low and high-involvement conditions. Petty and Cacioppo argued that whereas individuals under low involvement used the attractiveness of the source as a cue, individuals under high involvement used the attractiveness as an argument (in the context of beauty products). In line with research on beliefs about cues of deception (e.g. Akehurst, Koehnken, Vrij, & Bull, 1996; Granhag, Andersson, Strömwall, & Hartwig, 2004), we would argue that people believe that verbal and nonverbal cues are both valid indicators of credibility of a source. Individuals under high motivation therefore used all valid indicators, verbal and nonverbal cues, for their credibility attribution.

In summary, the results of Experiment 1 show that applying the basic assumptions of dual-process theories to the field of credibility attribution can be fruitful. By way of criticism, it could be argued that although people with low motivation used only nonverbal cues for their credibility attribution, Experiment 1 could not provide direct evidence that the use of nonverbal cues is easier and requires less cognitive resources than the processing of verbal cues. To test that assumption, in Experiment 2 we directly manipulated, besides nonverbal and verbal cue information, the cognitive resources people had available when making credibility attributions.

## Experiment 2

The aim of Experiment 2 was to directly test the hypotheses that nonverbal cue information is easier to process than verbal cue information. If this argument is true, people with limited cognitive capacity should use nonverbal cues for their credibility judgments. To test this assumption, we used a secondary task technique inducing high cognitive load (see Paas, Tuovinen, Tabbers, & Gerven, 2003) in order to limit cognitive capacity. In detail, we tested the following hypotheses. First, if cognitive load is high, people should use nonverbal but not verbal cues for their credibility attribution. Second, if cognitive load is low, people should use both nonverbal and verbal cues for their credibility attribution.

## *Method*

### *Participants*

Ninety-six female and one-hundred and four male students at the University of Giessen (mean age = 23.9) participated as volunteers in partial fulfilment of departmental requirements. The study lasted 20 minutes.

### *Design*

The design was a 2 x 2 x 2 between-participants design, with verbal information (truthful cues or deceptive cues), nonverbal information (truthful cues or deceptive cues), and cognitive load of participants (low or high) completely crossed. Twenty-five participants were randomly assigned to each of the eight cells in the design.

### *Procedure*

Participants were seated alone in front of a computer and were reminded that the present study examined memory processes. All instructions were provided on screen. Participants in the high cognitive load group were then given the following instruction: "On the next screen you will see a nine-digit number for 60 seconds. Please try to keep this number in mind during the following assignment and questions. You will be asked to recall the number later. We will compare the recalled number with the actual number." The next screen then displayed the number (813947284) for 60 seconds. This task was absent in the low cognitive load condition.

To maintain the salience of the cover story, participants in both conditions received four questions on autobiographical memory ("How many courses in biology did you take in high school?," "How many friends did you have during your time at the high school?," "How many bicycles did you have until now?," and "How many papers did you present during your time at the university?").

Next, participants watched the film already used in Experiment 1 and the following dependent measures were assessed. First, the credibility attribution was measured with the five items used in Experiment 1 (Cronbach's *alpha* = .92). We also used a single item to asses a judgment of truth or deception ("Was Anna deceptive or truthful?" Scale from 1 = deceptive to 9 = truthful). Then the perception of the verbal cues and the perception of the nonverbal cues were measured with the same items used in Experiment 1 (Cronbach's *alpha* = .98 and .97). Finally, participants answered four questions on their self-perceived distraction whereas answering the questions concerning autobiographical memory and the questions about the film (manipulation check; Cronbach's *alpha* = .97). One example item was: "I felt distracted while seeing the film and answering the questions." These questions were answered on a scale ranging from 1 (completely disagree) to 9 (completely agree).

*Results*

The data of the 200 participants were analyzed by separate univariate 2 (cognitive load: low versus high) x 2 (nonverbal cues: deceptive versus truthful) x 2 (verbal cues: deceptive versus truthful) ANOVAs.[4]

*Manipulation Checks*

*Cognitive Load.* The findings show that the experimental distraction manipulation was successful: cognitive load had a strong effect on the perceived distraction, $F(1, 192) = 47.00$, $p < .001$; eta-squared = 0.20. Perceived distraction was higher for participants with high than for those with low cognitive load ($M = 5.95$, $SD = 1.50$ vs. $M = 4.53$, $SD = 1.38$). All other *F*s < 1.

*Verbal cues.* The expected main effect of the verbal cue manipulation became highly significant, $F(1, 192) = 57.34$, $p < .001$, eta-squared = 0.23. Participants evaluated the verbal information of the statements as significantly more plausible in the truthful cue ($M = 5.46$, $SD = 1.71$) than in the deceptive cue information condition ($M = 3.78$, $SD = 1.38$). All other *F*s < 1.

*Nonverbal cues.* As predicted, participants evaluated the overall behaviour of Anna as significantly less believable in the deceptive cue ($M = 3.89$, $SD = 1.09$) than in the truthful cue ($M = 5.12$, $SD = 1.70$) nonverbal information condition, $F(1, 192) = 36.29$, $p < .001$, eta-squared = 0.16. All other *F*s < 1.

*Major dependent variables*

*Credibility attribution.* The means of both major dependent measures for all eight conditions are displayed in Table 2. The main effect of nonverbal information was significant, $F(1, 192) = 54.75$, $p < .001$, eta-squared = 0.22. Participants attributed higher credibility in the truthful cue ($M = 5.18$, $SD = 1.12$) than in the deceptive cue ($M = 4.15$, $SD = 0.97$) nonverbal information condition. There was also a significant main effect of verbal information, $F(1, 192) = 19.66$, $p < .001$, eta-squared = 0.09 (truthful verbal cues: $M = 4.98$, $SD = 1.21$; deceptive verbal cues: $M = 4.35$, $SD = 1.05$).

The predicted interaction of cognitive load and verbal information (see Figure 2) was significant, $F(1, 192) = 9.57$, $p < .005$, eta-squared = 0.05. Participants in the low cognitive load condition attributed higher credibility in the truthful cue ($M = 5.18$, $SD = 1.24$) than in the deceptive cue verbal information condition ($M = 4.12$, $SD = 1.08$), $F(1, 192) = 28.55$, $p < .001$, eta-squared = 0.13. Participants in the high cognitive load condition did not differentiate between truthful cue and deceptive cue verbal information, ($M$s = 4.77 and 4.58, $SD$s = 1.14 and 0.96, respectively), $F < 1$. No other effects became significant, all $F$s < 1.

*Judgment of truth and deception.* The ANOVA yielded a significant main effect of verbal information on participants' judgment of truth and deception , $F(1, 192) = 7.75$, $p < .01$, eta-squared = 0.04. In the deceptive verbal cue information condition, participants judged the source as more deceptive ($M = 4.43$, $SD = 1.50$) than in the truthful cue verbal information condition ($M = 4.96$, $SD = 1.47$). Moreover, the main effect of nonverbal information was also significant, $F(1, 192) = 35.24$, $p < .001$, eta-squared = 0.16. Participants perceived the source as more deceptive in the deceptive cue ($M = 4.13$, $SD = 1.31$) than in the truthful cue nonverbal information condition ($M = 5.26$, $SD = 1.48$).

The predicted interaction of cognitive load with verbal information was also significant, $F(1, 192) = 10.95$, $p < .005$, eta-squared = 0.05. Participants in the low cognitive load condition perceived the source as more deceptive in the deceptive verbal cue ($M = 4.06$, $SD = 1.60$) than in the truthful verbal cue condition, ($M = 5.22$, $SD = 1.43$), $F(1, 192) = 18.57$, $p < .001$, eta-squared = 0.09. Participants in the high cognitive load condition did not differentiate between verbal truthful and deceptive cues ($M$s = 4.80 and 4.70, $SD$s = 1.30 and 1.47, respectively, $F$s < 1. All other $p$s > .19.

*Discussion*

The results clearly confirm the hypotheses that participants under low cognitive load followed the central route (systematic processing) and relied on both the verbal cues and the nonverbal cues to judge credibility. In contrast, participants under high cognitive load were uninfluenced by verbal cues. Independently of the consistency and plausibility of the statement, they relied exclusively on the nonverbal cues to make their credibility attribution. More credibility was attributed in the truthful nonverbal cue than in the deceptive nonverbal cue condition. The above-described interaction of load with verbal information showed the same pattern for both the credibility attribution and the judgement of truth and deception.

Both the results of Experiment 1 and 2 support the usefulness of the basic assumptions of dual-process theories to explain the influence of task involvement and cognitive capacity on the process of credibility attribution. Moreover, Experiment 2 found direct evidence that nonverbal (in contrast to verbal) cue information is easier to use when attributing the credibility. Nonverbal cues were used under conditions of both high and low cognitive load. In contrast, the verbal cues were used only by individuals with high cognitive capacity (low cognitive load) for their credibility attribution. In a third Experiment, we wanted to replicate the findings of Experiment 2 with different experimental material. Moreover, in Experiment 3 we assessed participants' reasons for their credibility attribution in order to examine our assumption that people under high cognitive load use nonverbal but not verbal information for their credibility attribution. We predicted, first, that under high cognitive load participants would report more nonverbal-related reasons than verbal-related reasons. In contrast, participants under low cognitive load would report more verbal-related reasons than nonverbal-related reasons. Second, we assumed that for participants under high cognitive load, credibility attribution could best be predicted by the valence of nonverbal-related reasons, but not by the valence of verbal-related reasons. For participants under low cognitive load, credibility attribution could be predicted by the valence of both nonverbal-related reasons and verbal-related reasons.

## Experiment 3

### *Method*

*Participants*

Seventy-three female and seventy-one male students at the University of Mannheim (mean age = 24.2) participated as volunteers in partial fulfilment of departmental requirements. The study lasted 25 minutes.

*Design*

The design was a 2 x 2 x 2 between-participants design, with verbal information (truthful cues or deceptive cues), nonverbal information (truthful cues or deceptive cues), and cognitive load of participants (low or high) completely crossed. Eighteen participants were randomly assigned to each of the eight cells in the design.

*Procedure*

Participants were treated identically to the procedure in Experiment 2, with the exception that the participants saw a different film. We created four parallel versions of a short film of about five minutes about an argument between a woman (Sabine) and her boyfriend (Carsten) about a broken appointment. The woman and the man were amateur performer who volunteered to participate in the film. The camera was set up in such a way that in each version of the film one could only see Carsten, but hear both Carsten's and Sabine's voices. We manipulated the verbal content of Carsten's statements about his non-appearance. Parallel to the material used in Experiment 1 and 2, the truthful statements were manipulated so as to be judged more consistent and more plausible than the deceptive statements.[5] In addition, we used three nonverbal cues - gaze aversion, adaptors, and posture shifts - to simulate truthful and deceptive nonverbal behaviour. The actor displayed more gaze aversion, more adaptors, and more posture shifts when simulating deceptive nonverbal information.[6]

After participants had watched the film, the following dependent measures were assessed. First, the credibility attribution was measured with the five items used in Experiment 1 and 2 (Cronbach's *alpha* = .86). Next we asked participants to give reasons for their credibility attribution. On a blank sheet, participants had to write down reasons why they thought Carsten had low or high credibility. Then the perception of the verbal cues and the perception of the nonverbal cues were measured with the same items used in the previous two Experiments (Cronbach's *alpha* = .95 and .93). Finally, the manipulation check for the self-perceived distraction was assessed with the same items used in Experiment 2 (Cronbach's *alpha* = .95).

### *Results*

The data of the 144 participants were analyzed by separate univariate 2 (cognitive load: low versus high) x 2 (nonverbal cues: deceptive versus truthful) x 2 (verbal cues: deceptive versus truthful) ANOVAs.

*Manipulation Checks*

*Cognitive Load.* The experimental distraction manipulation was successful: cognitive load had a strong effect on the perceived distraction, $F(1, 136) = 76.29$, $p < .001$; eta-squared = 0.36. Perceived distraction was higher for participants with high than for those with low cognitive load ($M = 5.91$, $SD = 1.93$ vs. $M = 3.53$, $SD = 1.19$).[7] All other *F*s < 1.

*Verbal Cues.* The expected main effect of the verbal cue manipulation became significant, $F(1, 136) = 12.64$, $p < .005$, eta-squared = 0.09. Participants evaluated the content of the statements as significantly more plausible in the truthful ($M = 5.62$, $SD = 1.23$) than in the deceptive verbal cues condition ($M = 4.70$, $SD = 1.78$). All other *F*s < 1.

*Nonverbal Cues.* As predicted, participants evaluated the overall behaviour of Anna as significantly less believable in the deceptive ($M = 3.66$, $SD = 1.82$) than in the truthful ($M = 4.67$, $SD = 1.28$) nonverbal cues condition, $F(1, 136) = 14.33$, $p < .001$, eta-squared = 0.10. All other *F*s < 1.

*Major dependent variables*

*Credibility attribution.* The means of both major dependent measures for all eight conditions are displayed in Table 3. The main effect of nonverbal information was significant, $F(1, 136) = 25.37$, $p < .001$, eta-squared = 0.16. Participants attributed higher credibility in the truthful ($M = 5.02$, $SD = 1.85$) than in the deceptive ($M = 3.79$, $SD = 1.17$) nonverbal cue condition. There was also a significant main effect of verbal information, $F(1, 136) = 9.86$, $p < .005$, eta-squared = 0.07 (truthful verbal cues: $M = 4.79$, $SD = 1.71$; deceptive verbal cues: $M = 4.02$, $SD = 1.53$).

The predicted interaction of cognitive load and verbal information (see Figure 3) was significant, $F(1, 136) = 9.00$, $p < .005$, eta-squared = 0.06. Participants in the low cognitive load condition attribute higher credibility to the truthful verbal ($M = 5.00$, $SD = 1.61$) than the deceptive verbal cue ($M = 3.50$, $SD = 1.16$), $F(1, 136) = 18.67$, $p < .001$, eta-squared = 0.12. Participants in the high cognitive load condition did not differentiate between truthful and deceptive verbal cues, (*M*s = 4.44 and 4.58, *SD*s = 1.69 and 1.81, respectively), $F < 1$. No other effects became significant, all *p*s > .20.

*Reasons for the credibility attribution.* Two independent judges, who were blind to the experimental conditions and the hypotheses of the experiment, coded the reasons listed by the participants as either verbal-content-related or source-nonverbal-related, and as positive or negative in their valence. For example, the listed reason “Carsten’s statements were implausible since he would have heard the telephone” was coded as negative verbal-related. The reason “Carsten was not at all nervous, I would believe him” was coded as positive nonverbal-related. The two judges had a high inter-rater agreement (Cohen’s *kappa* = .94). The index of verbal-related reasons was defined as number of verbal-related reasons/ total number of reasons. The index of nonverbal-related reasons was defined as number of nonverbal-related reasons/ total number of reasons. To test whether verbal-related reasons were more frequently reported in the low load than the high load condition, and whether nonverbal-related reasons were more frequently reported in the high load than the low load condition, the number of verbal-related reasons and source-nonverbal related reasons were analyzed as a function of cognitive load, verbal information, and nonverbal information, using the type of reported reasons as a repeated measure. The total number of reported reasons was included as a covariate. Participants reported generally more verbal-related reasons ($M = 1.74$, $SD = 0.89$) than nonverbal-related reasons ($M = 1.08$, $SD = 0.85$), $F(1, 136) = 26.12$, $p < .001$, eta-squared = 0.16. Moreover, the expected interaction of cognitive load with type of reasons was significant, $F(1, 136) = 6.94$, $p < .01$, eta-squared = 0.05 (see Figure 4). Under low cognitive load, participants reported, in line with our hypotheses, significantly more verbal-related ($M = 1.94$, $SD = 0.92$) than nonverbal-related reasons ($M = 0.94$, $SD = 0.75$), $F(1, 136) = 60.00$, $p < .001$; eta-squared = 0.30. Under high cognitive load, participants unexpectedly also reported significantly more verbal-related ($M$ = 1.54, $SD$ = 0.82) than nonverbal-related reasons ($M$ = 1.22, $SD$ = 0.92), but this difference was quite a bit smaller, $F(1, 136) = 6.14$, $p < .05$; eta-squared = 0.04. No other effects were significant ($p >$ .30).

We compute the valence of verbal-related and nonverbal-related reasons by subtracting negative from positive verbal-related reasons (valence of verbal), and by subtracting negative from positive nonverbal-related reasons (valence of nonverbal). To test, first, the hypothesis that the verbal manipulation affects the verbal related reasons only for participants under low cognitive load, and, second, that the nonverbal information affects the nonverbal-related reasons for participants under high and low cognitive load, the valences of verbal-related reasons and source-nonverbal related reasons were analyzed as a function of cognitive load, verbal information, and nonverbal information, using the type of valence as a repeated measure. The total number of reported reasons was included as a covariate. Overall, the valence of verbal-related reasons ($M$ = 0.72, $SD$ = 1.28) was more positive than the valence of nonverbal-related reasons ($M$ = 0.14, $SD$ = 1.15), $F(1, 135) = 28.33$, $p < .001$, eta-squared = 0.17. The interaction of nonverbal cue manipulation with type of reasons was significant, $F(1, 135) = 11.93$, $p < .005$, eta-squared = 0.08 (valence of nonverbal-related: deceptive nonverbal cue ($M$ = -0.44, $SD$ = 1.18) vs. truthful nonverbal cue ($M$ = 0.47, $SD$ = 1.15); valence of verbal-related: deceptive nonverbal cue ($M$ = 0.72, $SD$ = 1.33) vs. truthful nonverbal cue ($M$ = 0.71, $SD$ = 1.25). Most interestingly, the predicted interaction of cognitive load with verbal manipulation with type of valence of reasons was significant, $F(1, 135) = 9.84$, $p < .01$, eta-squared = 0.07 (see Table 4). Whereas under both load conditions the valence of nonverbal-related reasons were not influenced by the verbal manipulation (all $p > .20$), a different pattern was found for the valence of verbal-related reasons. Under low cognitive load, the valence of verbal-related reasons were significantly influenced by the verbal manipulation, with more negative reasons in the deceptive verbal cue (M = -0.33, $SD$ = 1.17) than in the truthful verbal cue condition ($M$ = 1.39, $SD$ = 1.15), $F(1, 135) = 85.89$, $p <$ .001; eta-squared = 0.38. In the high load condition, no difference was found between the deceptive and truthful cue condition (deceptive verbal cue: $M = 0.92$, $SD = 1.05$ vs. truthful verbal cue: $M = 0.89$, $SD = 1.14$, $F < 1$)[8].

A multiple linear regression analysis was applied to investigate the mechanisms underlying credibility attribution. First, the valence of nonverbal-related reasons should predict credibility attribution for both load conditions. Moreover, it was postulated that the valence of verbal-related reasons would determine credibility attribution differently, depending on cognitive load. Accordingly, for the prediction of credibility attribution, a significant coefficient was expected from the interaction term of load and valence of verbal-related reasons. Valence scores were standardized. Interaction terms were then computed by multiplying load (coded “0” for high and “1” for low load) by valence of verbal-related reasons and valence of nonverbal-related reasons. We included number of reasons as a covariate.

The results of the regression predicting credibility attribution can be seen in Table 5. R for the regression was significantly different from zero, F (6, 137) = 15.19, p < .001. Altogether, 39.9% (37.3% adjusted) of the variability in credibility attribution was predicted by the independent variables. The interaction term of load with valence of nonverbal-related reasons was not significant. In line with our assumptions the interaction term of load with valence of verbal-related reasons showed a statistically significant effect in the equation ($B$ = 1.02, $t(137) = 4.35$, $p < .001$). The interaction terms showed that the impact of valence of verbal-related reasons on credibility attribution was different in the load conditions. To justify the usage of valence indices as bipolar evaluations in the regression analyses, we also conducted separate linear regression analyses to investigate the mechanisms underlying credibility attribution for positive or negative verbal and nonverbal reasons (see Blanton, Jaccard, Gonzeles, & Christie, 2006; Cacioppo, Gardner, & Berntson, 1997). The results of these separate analyses parallel the results of the regression analysis with the valence indices[9].

To investigate the nature of this interaction, we used the recentering procedure discussed by Cohen, Cohen, and West (2002). First, to test the influence of nonverbal- and verbal-related reasons on the credibility attribution for the low load condition, we coded low load to be 0 and high load to be 1. In a regression, credibility attribution was predicted by load, verbal-related reasons, nonverbal-related reasons, and the first-order cross-products of load with verbal-related reasons and nonverbal-related reasons. In this analysis, credibility attribution was predicted by valence of nonverbal- and verbal-related reasons. Both valence indices had a statistically significant effect in the equation, (verbal: $B = 0.71$, $t(137) = 4.99$, $p < .001$; nonverbal: $B = 0.75$, $t(137) = 4.30$, $p < .001$). Second, to test the influence of nonverbal- and verbal-related reasons on the credibility attribution for the high load condition, we coded low load to be 1 and high load to be 0. In a regression, credibility attribution was predicted by load, verbal-related reasons, nonverbal-related reasons, and the first-order cross-products of load with verbal-related reasons and nonverbal-related reasons. Here, only the valence of nonverbal-related reasons had a statistically significant effect on the prediction of attribution, $B = 0.79$, $t(137) = 5.37$, $p < .001$, whereas the coefficient of valence of verbal-related reasons was statistically not significant ($B = - 0.31$, $t(137) = -1.66$, $p = .099$).

*Discussion*

The results replicated the findings of Experiment 2 with different experimental material and provided further evidence that the amount of cognitive capacity affects the use of nonverbal and verbal information in the process of credibility attribution. First, as in Experiment 2, under high cognitive load (and thus with less cognitive capacity) only the manipulation of nonverbal behaviour had an impact on participants' credibility attribution. The manipulation of verbal information did not influence the credibility attribution for participants with less cognitive capacity. When sufficient cognitive capacity was available, the manipulation of both verbal and nonverbal information had an effect on the credibility attribution. Second, the results of the reported reasons for the credibility judgments in Experiment 3 strengthen the theoretical assumption that cognitive capacity did affect the use of nonverbal and verbal information. When the cognitive capacity of participants was limited, more nonverbal-related reasons than verbal-related reasons were reported, and the credibility judgment could be predicted by the valence of nonverbal-related reasons, but not by the valence of verbal-related reasons. In contrast, for participants with sufficient cognitive capacity, both valence indices were good predictors for the credibility judgment.

## General Discussion

### *Dual-process models and the process of credibility attribution*

Three experiments demonstrated the usefulness of dual-process theories to explain the process of credibility attribution. In particular, the influence of task involvement and cognitive capacity on the choice of more or less extensive information processing was examined. The results of all three experiments were in line with the assumption that high, in contrast to low, task involvement/cognitive capacity leads to central/systematic processing when judging credibility. This assumption was tested and confirmed with different experimental material. Experiment 1 showed that participants in a high-involved state used all judgment-relevant information. They judged a statement as more credible when the source showed no nonverbal cues of deception, <u>and</u> when the statement was plausible. In contrast, participants with low task involvement used only the source cue information (nonverbal information) for their credibility attribution. The verbal information had no impact. Experiment 2 and 3 showed that the manipulation of cognitive load had a parallel effect on the process of credibility attribution. When the cognitive load was low, participants used both the verbal and nonverbal information for their credibility attribution. Under high cognitive load, only the manipulation of nonverbal information had an impact on participants' credibility attribution. Moreover, the results of Experiment 2 and 3 found evidence that nonverbal information was easier to use than verbal information when attributing credibility. Whereas verbal information was used only when cognitive load was low, nonverbal information was also used when participants had limited cognitive capacity available. The coded reasons participants reported for their credibility attribution strengthen our interpretation: For participants with sufficient cognitive resources, the credibility attribution could be predicted by both the verbal-related and nonverbal-related reasons. In contrast, only nonverbal-related reasons had an impact on the credibility attribution of participants with restricted cognitive resources. In sum, the reported three Experiments found clear support for the basic assumption - derived from dual-process models - that motivation and cognitive capacity influence the use of more or less extensive information processing.

*Further research*

The present work demonstrates the fruitfulness of applying dual-process theories as a theoretical framework to the field of deceptive communication research, especially to the process of credibility attribution. Dual-process theories make clear predictions about the conditions under which individuals use more extensive processing modes, and thus use verbal information more intensely to judge the credibility of a statement (Chen & Chaiken, 1999; Petty & Wegener, 1999). Aside from task involvement and cognitive capacity, as well as personal dispositions such as ”need for cognition” (NFC; Cacioppo & Petty, 1982), a tendency to enjoy cognitive activities may also influence the choice of central/systematic or peripheral/heuristic processing. For example, people with high NFC should use a more extensive central/systematic route of processing, and people with low NFC should use the simpler peripheral/heuristic route when judging the veracity of information.

In our view, the results are also in accordance with the unimodel (Kruglanski, Thompson, & Spiegel, 1999). In contrast to dual-process theories of persuasion, the unimodel assumes only one single route of persuasion (Kruglanski et al., 1999; Kruglanski & Thompson, 1999). Kruglanski et al. (1999) argue that there is no qualitative difference between the two routes defined by the ELM and HSM. According to the unimodel, ”the two persuasion types (central/systematic and peripheral/heuristic) are fundamentally similar, in that both are mediated via ‘if then” or syllogistic reasoning from evidence to conclusion” (Kruglanski et al., 1999, p. 297). Kruglanski et al. (1999) further assume that both routes of persuasion may differ quantitatively on the extent of information processing. Low task involvement or limited capacity should lead to a restricted processing of relevant information, independently of the type of information. Whether low task involvement or limited cognitive capacity results in processing of verbal or non-verbal information depends on the length/complexity of the particular (verbal or non-verbal) information. We think that this view is in line with our interpretation of the results of the three experiments. Low task involvement (Experiment 1) or low cognitive capacity (Experiment 2 and 3) resulted in processing of information that is easier to use (e.g. nonverbal information), but not in processing of verbal information, which is more difficult to use. A test of the more specific predictions from dual-process theories that differ from the predictions of the unimodel goes beyond a scope of this paper.

Overall, our studies have shown that dual-process theories can help us to understand the process of lie detection (see also Forrest & Feldman, 2000). These theories also allow predictions about the conditions under which people are worse or better lie detectors. However, the ultimate success in lie detection will depend on whether the cues that lie detectors use are, in fact, correlates of deception (see DePaulo et al., 2003; Reinhard et al., 2002).

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Footnotes

[1] We found no significant effects of participants' sex on the manipulation check-scales and on the credibility judgments, all $p > .20$.
[2] In a pretest ($N = 24$), participants (randomly assigned) saw one of the four versions of the short film and evaluated the plausibility of the verbal statements by Anna on five items (plausible, consistent, coherent, structured, specific). The truthful statements ($M = 6.92$) were judged to be significantly more plausible than the deceptive statements ($M = 4.58$), $F(1, 20) = 5.99$, $p < .05$, $r = .48$.
[3] In another pretest, participants ($N = 24$) (randomly assigned) saw one of the four versions of the short film and were instructed to code the nonverbal behaviors of the actress. In the deceptive nonverbal information condition, participants recorded significantly more adaptors ($F(1, 20) = 15.88$, $p < .005$, $r = .67$), less direct eye gaze ($F(1, 20) = 53.97$, $p < .001$, $r = .85$), and more posture shifts ($F(1, 20) = 233.06$, $p < .001$, $r = .96$) than in the truthful nonverbal information condition (*M*s = 1.58, 9.67, and 7.25 in the untruthful, and 0.08, 0.17, and 0.17 in the truthful conditions, respectively).
[4] Sex of participants produced no effects on the manipulation check-scales and on the credibility judgments, all $F < 1$.
[5] In a pretest ($N = 104$), the truthful statements ($M = 5.70$) were judged to be significantly more plausible than the deceptive statements ($M = 5.05$), $F(1, 104) = 6.90$, $p < .05$.
[6] Participants in a pretest ($N = 40$) judged the nonverbal behaviours of the actor in the deceptive nonverbal information condition as significantly more deceptive ($M = 4.48$) than in the truthful nonverbal information condition ($M = 5.50$), $F(1, 38) = 8.46$, $p < .05$.
[7] In the high load condition, eighty-seven percent of participants remembered at least seven digits correctly, and 71.7 percent remembered all nine digits correctly. These results show that the participants - at least in part - directed their attention to the second task (see Paas et al., 2003, for a detailed description of secondary task techniques and cognitive load). The correct recall of the nine digit number was not related to the use of verbal and non-verbal information.
[8] In a separate analysis, positive verbal vs. nonverbal reasons were analyzed as a function of cognitive load, verbal cues, and nonverbal cues, using the type of reason as a repeated measure. The assumed interaction of cognitive load, verbal cues, and type of reason was not significant ($F(1, 135) = 2.54$, $p = .11$). When we analyzed solely negative verbal vs. nonverbal reasons as a function of cognitive load, verbal cues, and nonverbal cues, using the type of reason as a repeated measure, the assumed interaction of cognitive load, verbal cues, and type of reason was significant ($F(1, 135) = 8.81$, $p < .005$).
[9] The results of the analysis including only the positive verbal and nonverbal reasons were in line with the hypotheses (interaction verbal with load: B = 0.56, t(137) = 2.46, p < .02). The results including only the negative verbal and nonverbal reasons were also in line with our assumptions (interaction verbal with load: B = -1.28, t(137) = -4.62, p < .001).

Table 1

*Means of Credibility Attribution as a Function of Participants' Involvement, Nonverbal, and Verbal Cues in Experiment 1*

| Involvement | Nonverbal Cue | Verbal Cue | Credibility Attribution |
|---|---|---|---|
| Low | Deceptive | Deceptive | 3.82 (0.86) |
| | | Truthful | 4.05 (0.85) |
| | Truthful | Deceptive | 5.38 (0.93) |
| | | Truthful | 5.35 (1.60) |
| High | Deceptive | Deceptive | 4.31 (0.92) |
| | | Truthful | 5.13 (1.22) |
| | Truthful | Deceptive | 5.32 (1.18) |
| | | Truthful | 6.58 (1.31) |

*Note*. $N$ = 20 per cell. 1 = low credibility, 9 = high credibility. Standard deviations in parentheses.

Table 2

*Means of Credibility Attribution and Judgment of Truth or Deception as a Function of Participants' Cognitive Load, Nonverbal, and Verbal Cues in Experiment 2*

| Load | Nonverbal Cue | Verbal Cue | Credibility Attribution[1] | Judgment of Truth or Deception[2] |
|---|---|---|---|---|
| High | Deceptive | Deceptive | 4.00 (0.78) | 4.08 (1.15) |
| | | Truthful | 4.22 (1.25) | 4.04 (1.45) |
| | Truthful | Deceptive | 5.17 (0.75) | 5.52 (1.01) |
| | | Truthful | 5.33 (0.67) | 5.36 (1.19) |
| Low | Deceptive | Deceptive | 3.62 (0.77) | 3.52 (1.23) |
| | | Truthful | 4.74 (0.62) | 4.88 (1.05) |
| | Truthful | Deceptive | 4.62 (1.13) | 4.60 (1.78) |
| | | Truthful | 5.62 (1.55) | 5.56 (1.69) |

*Note*. *N* = 25 per cell. [1]1 = low credibility, 9 = high credibility. [2]1 = deceptive to 9 = truthful. Standard deviations in parentheses.

Table 3

*Means of Credibility Attribution as a Function of Participants' Cognitive Load, Nonverbal, and Verbal Cues in Experiment 3*

| Load | Nonverbal Cue | Verbal Cue | Credibility Attribution |
|---|---|---|---|
| High | Deceptive | Deceptive | 3.82 (0.74) |
| | | Truthful | 4.00 (1.40) |
| | Truthful | Deceptive | 5.27 (2.06) |
| | | Truthful | 5.16 (2.02) |
| Low | Deceptive | Deceptive | 3.07 (1.29) |
| | | Truthful | 4.26 (0.86) |
| | Truthful | Deceptive | 3.92 (0.83) |
| | | Truthful | 5.74 (1.84) |

*Note*. *N* = 18 per cell. 1 = low credibility, 9 = high credibility. Standard deviations in parentheses.

Table 4

*Mean Valence of Reasons as a Function of Participants' Cognitive Load, Verbal Cue, and Type of Reason*

| Type of Reason | Cognitive Load | Verbal Cue | Valence of Reasons |
|---|---|---|---|
| Nonverbal | High | Deceptive | -0.19 (1.50) |
| | | Truthful | -0.03 (1.16) |
| | Low | Deceptive | 0.00 (1.26) |
| | | Truthful | 0.28 (1.03) |
| Verbal | High | Deceptive | 0.92 (1.05) |
| | | Truthful | 0.89 (1.14) |
| | Low | Deceptive | -0.33 (1.17) |
| | | Truthful | 1.39 (1.15) |

*Note*. *N* = 36 per cell. Standard deviations in parentheses.

Table 5

*Summary of Regression Analysis for Variables Predicting Credibility Attribution in Experiment 3 (N = 144)*

| Variable | B | SE B | β |
|---|---|---|---|
| Cognitive Load | -0.42 | 0.22 | -0.13 |
| Valence of verbal-related reasons | -0.31 | 0.19 | -.18 |
| Valence of nonverbal-related reasons | 0.79 | 0.15 | .47* |
| Load × Valence of verbal-related reasons | 1.02 | 0.23 | .49* |
| Load × Valence of nonverbal-related reasons | -0.03 | 0.23 | -.01 |
| Total number of reasons | 0.16 | 0.11 | 0.10 |

*Note*. * $p < .001$

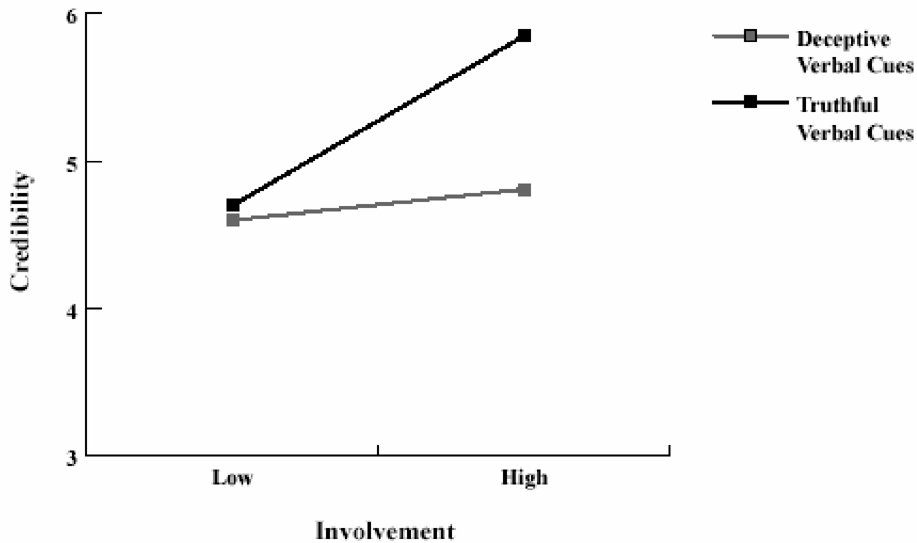


*Figure 1.* Means of Credibility Attribution as a Function of Participants' Involvement and Verbal Cues in Experiment 1.

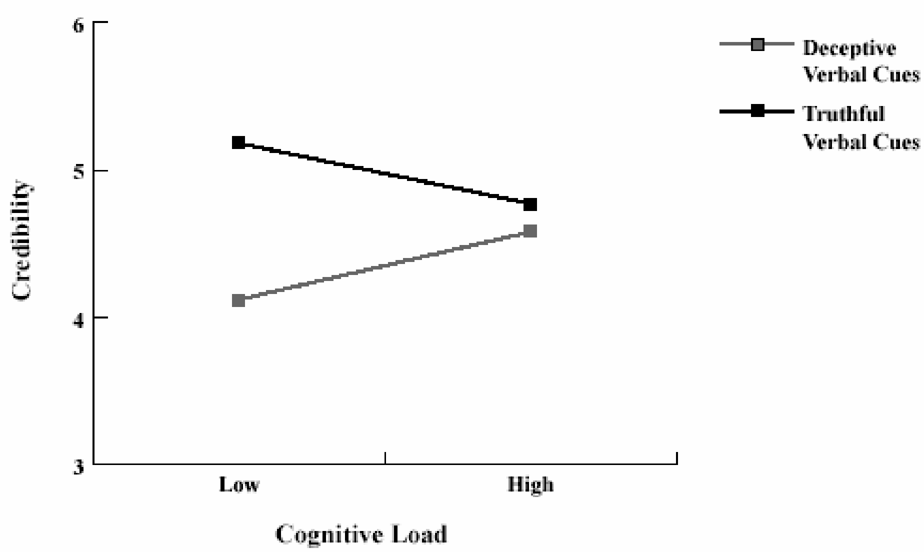


*Figure 2.* Means of Credibility Attribution as a Function of Participants' Cognitive Load and Verbal Cues in Experiment 2.

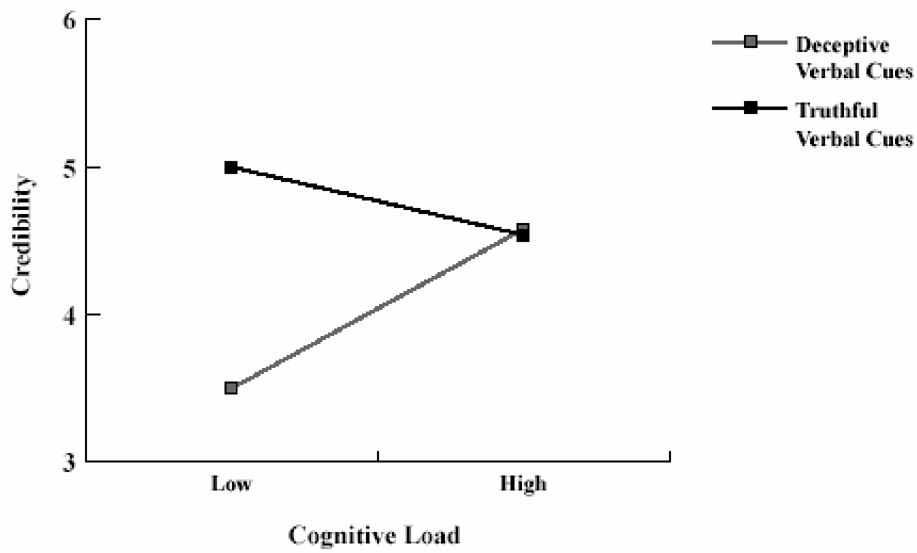


*Figure 3.* Means of Credibility Attribution as a Function of Participants' Cognitive Load and Verbal Cues in Experiment 3.

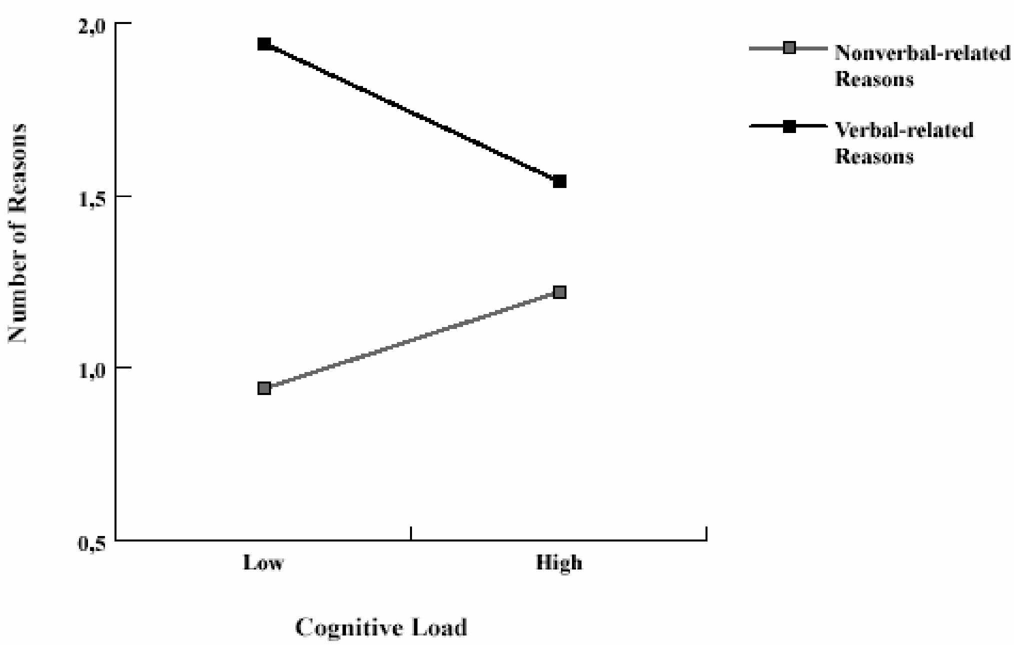


*Figure 4.* Number of Reasons as a Function of Participants' Cognitive Load and Type of Reasons.