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From repetition to conviction: Attitude accessibility as a determinant of attitude certainty☆

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Abstract

The present experiment investigated the influence of attitude accessibility on several meta-attitudinal strength measures. It was predicted that certainty and perceived likelihood of change, i.e., commitment-related attributes of attitude strength, are influenced by changes in attitude accessibility, while no effects were expected for importance and perceived centrality to values and the self, i.e., centrality-related attributes. Accessibility was manipulated by having participants express their attitudes either repeatedly or only once. As hypothesized, accessibility and measures of commitment were enhanced after repeated expression compared to single expression. Furthermore, mediation analyses supported the idea that subjective commitment may be inferred from the ease of attitude retrieval. Centrality-related attributes were found to be unaffected by the accessibility manipulation. The results are discussed in the light of a multi-dimensional structure of attitude strength and antecedent processes of meta-cognitive attributes of strength.
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Consider John who invites several friends to come over for a game of Trivial Pursuit. Awaiting his friends, he watches an item on television about the Vietnamese city of Saigon. Later that evening, he and his friends play Trivial Pursuit. After a couple of rounds, John is asked the question: "What is the capital city of Vietnam?" Feeling quite confident, John promptly answers: "Saigon!"

John may have been very confident of his faulty answer, because Saigon happened to be highly accessible in his memory. Indeed, a series of experiments by Kelly and Lindsay (1993) suggests that confidence with regard to answers to knowledge questions may be inferred from the ease with which the answer comes to mind (see also Tversky & Kahneman, 1973). The present research aimed to elaborate further on the causal relation between accessibility and certainty in a quite different area, viz. the domain of attitudes. Both the certainty with which attitudes are held and the accessibility of attitudes in memory are important variables in the attitude literature, because they are assumed to reflect the strength of an attitude (see for reviews Fazio, 1995; Gross, Holtz, & Miller, 1995). Several studies have illustrated that attitude certainty is correlated with attitude accessibility (e.g., Bassili, 1993, 1996; Gross et al., 1995; Pomerantz, Chaiken, & Tordesillas, 1995). However, these studies do not specify any causal relation between accessibility and certainty. We argue that the confidence with which an attitude is held may be inferred from the ease with which the attitude comes to mind (see also Bem, 1972), in very much the same way as accessibility affects confidence in answering knowledge questions. To put it succinctly, on a meta-cognitive level, attitude accessibility may signal attitude certainty. One goal of the present experiment was to provide evidence for this causal relation between attitude accessibility and certainty.

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Attitude strength is usually defined in terms of its consequences: strong attitudes are persistent over time, resistant to change, and influence information processing and action (Krosnick & Petty, 1995). In investigating these outcomes of attitudes, researchers have focused on several attributes of attitudes that indicate the strength of an attitude. In addition to attitude certainty and attitude accessibility, other attributes have been studied such as personal importance of the attitude (Boninger, Krosnick, Berent, & Fabrigar, 1995b), centrality of the attitude to the self-concept (Holland, Verplanken, van Knippenberg, & Dijksterhuis, 2003), perceived likelihood of change (Pomerantz et al., 1995), the degree to which an attitude encompasses both positive and negative elements (Thompson, Zanna, & Griffin, 1995) and several others (see for a comprehensive overview Petty & Krosnick, 1995). Supporting the role of these attributes with regard to attitude strength, it has been demonstrated that these attributes affect the impact of attitudes on behavior, stability, resistance to change, and information processing (see for a review Kraus, 1995; Krosnick & Abelson, 1992; Petty & Krosnick, 1995).

To some extent, the great number of strength-related attributes that have been proposed in the literature is confusing and unclear. Researchers have tried to clarify the nature of attitude strength in several ways. Bassili (1996) introduced the insightful distinction between meta-attitudinal and operative strength measures. *Meta-attitudinal* strength measures are based on "'respondents' impressions of their own attitudes" (p. 5). For example, attitude certainty can be considered as a meta-attitudinal strength measure: it is based on the impression of the confidence with which an attitude is held. Conversely, Bassili refers to strength measures that are based on processes related to the judgment of the attitude as *operative* strength measures. Many of these operative strength measures reflect structural aspects of an attitude. For example, attitude accessibility is usually measured by the response time with which an attitude is indicated and is assumed to reflect the strength of the association between an object and its evaluation (Fazio, 1995). In general, the psychological processes and/or the structural components underlying operative strength measures are transparent and theoretically embedded. The underlying psychological processes of meta-cognitive judgments of strength however, are far less well understood. Questions that need to be addressed are: How do people form meta-cognitions with regard to strength? And, are all meta-attitudinal strength measures influenced by the same psychological processes?

The latter question pertains to another way by which researchers aimed to elucidate the concept of attitude strength: the dimensionality of attitude strength. Although attitude strength is generally considered to be a multi-dimensional construct (e.g., Abelson, 1988; Krosnick, Boninger, Chuang, Berent, & Carnot, 1993; Pomerantz et al., 1995; Raden, 1985), the exact nature of its multi-dimensional structure remains controversial. Factor-analytic studies, which predominantly investigated meta-attitudinal strength measures, have yielded mixed results (e.g., Abelson, 1988; Pomerantz et al., 1995; Prislin, 1996). Researchers have revealed slightly different factor structures in terms of content or number of strength factors (Abelson, 1988; Bassili, 1996; Erber, Hodges, & Wilson, 1995; Krosnick et al., 1993; Prislin, 1996). Still, two dimensions have received a considerable amount of support across several studies (Holland, Verplanken, Smeets, & van Knippenberg, 2003; Holland, Verplanken, van Knippenberg, & Karremans, 2003; Lastovica & Gardner, 1979; Pomerantz et al., 1995). One factor that emerged in these studies pertains to the clarity and decidedness of attitudes and consists of meta-attitudinal strength measures such as certainty and perceived likelihood of change. This factor is often called *commitment* (Holland et al., 2003; Holland et al., 2003; Lastovica & Gardner, 1979; Pomerantz et al., 1995). A second factor pertains to the motivational strength of an attitude and consists of meta-attitudinal attributes such as importance, self-relevance and value-relevance. We refer to this factor as *centrality* (cf. Bem, 1970; Judd & Krosnick, 1982; Katz, 1960). Thus, it seems that at least two dimensions may be distinguished in the domain of meta-attitudinal strength measures.

Although factor analytic studies may provide insight in the degree to which strength-related attributes are associated, they do not shed light on the origins and the sources of these attributes. In order to attain a better understanding of the nature of strength dimensions and their attributes, an experimental approach is warranted (cf. Bizer & Krosnick, 2001). Demonstrating that centrality and commitment-related attributes of attitude strength are differentially related to sources of strength, would further increase our understanding of the multi-dimensional structure of attitude strength.

In this paper, we will investigate attitude accessibility as a possible determinant of several strength-related attributes, including meta-attitudinal strength measures related to commitment such as certainty, perceived likelihood of change, and meta-attitudinal strength measures related to centrality, such as importance and self-relevance. We argue that meta-cognitive judgments related to commitment are partly based on the strength of the link between an object and its evaluation (Fazio, 1995). If the strength of the object–evaluation link increases, attitudes become more accessible in memory. We expect that the ease of attitude retrieval is used to infer the subjective commitment. Therefore, any manipulation of the strength of the object–evaluation link and thereby attitude accessibility is expected to influence commitment-related attributes of strength.

On the other hand, attitude accessibility is not expected to be a determinant of meta-cognitive judgments

of centrality. Although centrality-related attributes like attitude importance have been found to be moderately associated with accessibility (e.g., Krosnick, 1989), recent studies by Bizer and Krosnick (2001) suggest that whereas importance may be a source of accessibility, accessibility does not have a causal impact on importance. Nevertheless, a study of Roese and Olson (1994) has shown the opposite: their results indicated that repeatedly expressing an attitude enhanced attitude accessibility as well as attitude importance. In spite of this, Bizer and Krosnick showed in three studies that accessibility did not influence attitude importance. More specifically, in two experiments they failed to replicate the Roese and Olson findings, using the same repeated expression paradigm. At any rate, the impact of attitude accessibility on importance seems not a very robust phenomenon.

The dissociation between accessibility and importance may also become more easily understood if one considers cases in which likes or dislikes readily come to mind without any feeling of personal significance. For example, a person may quickly indicate his positive attitude towards banana-flavored ice cream or his dislikes of cockroaches without being personally involved to these issues. Therefore, importance may have different origins than accessibility. Indeed, Boninger, Krosnick, and Berent (1995a) argued that the bases of importance may relate to value-relevance, self-interest and/or strong identification with possible reference groups or reference individuals. In general, these findings suggest that if an attitude becomes more strongly linked to the self in one way or the other, this attitude becomes more important. Such links with the self are not signaled when people merely experience that their attitude is easily retrieved from memory. Therefore, we expect that centrality-related attributes of strength are not affected by accessibility manipulations.

In the present experiment attitude accessibility was manipulated by a repeated expression manipulation (e.g., Powell & Fazio, 1984). We investigated the effects of accessibility on meta-attitudinal attributes of commitment, i.e., certainty and subjective likelihood of change, and on meta-attitudinal attributes of centrality, i.e., importance, perceived centrality to values and the self. Several predictions were made. First, it is predicted that repeated attitude expression affects attitude accessibility (e.g., Bizer & Krosnick, 2001; Powell & Fazio, 1984). Second, it was predicted that the commitment related attributes certainty and the perceived likelihood of change are enhanced after repeatedly expressing an attitude compared to expressing an attitude only once. Third, it was hypothesized that repeated expression affects subjective commitment through its effect on attitude accessibility. In other words, the effects of repeated expression on meta-attitudinal attributes of commitment were expected to be mediated by accessibility. Finally, it was predicted that meta-attitudinal attributes pertaining to centrality remained unaffected by the accessibility manipulation.

Method

Participants and design. One hundred and fourteen undergraduate students from the University of Nijmegen participated in the experiment. These participants were randomly assigned to one of the cells of a 2 (Issue: Willem Alexander versus European Unification) $\times$ 2 (Repetition Condition: Willem Alexander repeated vs. European Unification repeated) $\times$ 2 (Strength measure: commitment vs. centrality). The first factor was varied within participants, while the latter two factors were varied between-participants. Participants received DFL. 5 (about 2 US Dollar) for participation.

Procedure

Participants were seated in individual cubicles behind a computer and a button box. They read on the computer screen that they participated in a study on attitudes. It was their task to evaluate target words as quickly and accurately as possible. The target words were presented one by one. Underneath the target word, one single semantic differential scale (e.g., bad–good, unfavorable–favorable, negative–positive) was presented on the screen as well. Participants were asked to evaluate the target word with the use of these semantic differentials. They could indicate their evaluation by a button box with two keys (left, *negative*; right, *positive*). After receiving three practice trials, the task consisted of 35 trials, which were randomly presented.

Within this task we manipulated the number of times participants had to evaluate the two target objects "Willem Alexander" (the Dutch crown prince) and "European Unification." Half of the participants responded six times towards Willem Alexander (*favorable–unfavorable*, *good–bad*, *pleasant–unpleasant*, *support–oppose*, *desirable–undesirable*, *positive–negative*) and 1 time towards "European Unification" (*positive–negative*). The other group of participants responded six times towards the European Unification and one time towards Willem Alexander. The attitude objects and the semantic differentials were randomly presented, with the exception that the final evaluation of the two target objects was always presented with the semantic differential "positive–negative." The response latencies to these items served as an indicator of attitude accessibility towards both attitude objects.

Measures of commitment and centrality. After the manipulation of repeated expression, participants responded to questions regarding meta-attitudinal judgments of attitude strength. Half of the participants

responded to questions that pertained to commitment, whereas the other half responded to questions that pertained to centrality. Studying these effects between participants is important, because Bizer and Krosnick (2001) showed that responding to questions about attitude strength might also increase the accessibility of attitudes. That is, measurements of self-reported attitude strength may interfere with our manipulation of accessibility. Thus, for an adequate test of our ideas, we should measure commitment and centrality directly after the accessibility manipulation. Accordingly, we used a between-participants design.

For participants in the commitment condition, two items were included: (1) certainty, "I am very certain about my attitude towards X" (1, *very uncertain*; 7, *very certain*) (2) likelihood of change, "How likely is it that you will change your attitude towards X in the near future" (1, *very unlikely*; 7, *very likely*). Responses to the latter item were recoded such that higher numbers represented stronger commitment. The scores of the two items were aggregated in order to construct indices of commitment towards both targets (α's = .73 and .78 for Willem Alexander and European Unification, respectively).

The other half of the participants answered questions pertaining to centrality. Three items were included: (1) importance, "To what extent is the issue of X important to you?" (1, *very unimportant*; 7, *very important*); (2) centrality, "To what extent is your attitude towards X related to your self-concept" (1, *not at all*; 7, *very much*); and (3) relation to values, "To what extent is your attitude towards X related to your important values?" These items were also aggregated (α's = .61 and .76, for Willem Alexander and European Unification, respectively). All items were taken from Pomerantz et al. (1995).

After they completed the computerized questionnaire, participants were debriefed, paid, thanked, and dismissed.

Results

Attitude accessibility

First, all response latencies were transformed by a 1/X transformation[1] (c.f., Fazio, 1990). The transformed response latencies of the two target objects were subjected to a 2 (Issue) × 2 (Repetition condition) × 2 (Strength measure) MANOVA. This analysis revealed a main effect for issue, $F\ (1, 106) = 8.72, p < .01$, indicating that attitudes towards Willem Alexander were expressed somewhat faster than attitudes towards European Unification. Moreover, the issue × repetition condition interaction was significant, $F\ (1, 106) = 128.65,\ p < .001$. Participants who repeatedly expressed Willem Alexander attitudes, reported their attitudes towards Willem Alexander more quickly than their attitudes towards European Unification, ($M = 715$ vs. $M = 1304$). Conversely, the participants who repeatedly expressed European Unification attitudes, reported their attitudes towards European Unification more quickly than their attitudes towards Willem Alexander ($M = 721$ vs. $M = 1126$). Thus, across issues and repetition conditions, repeatedly expressed attitudes were reported more quickly ($M =$ 718 ms) than were non-repeated attitudes ($M = 1205$ ms).

Attitude strength as a function of repeated expression

In order to analyze the effects of repeated expression on meta-attitudinal attributes of attitude strength, we subjected the measures of attitude strength (either commitment or centrality, depending on the strength measure condition) to a $2 \times 2 \times 2$ (Issue × Repetition condition × Strength measure) analysis of variance. This analyses revealed a main effect for strength measure, $F\ (1, 110) = 39.90,\ p < .001$, indicating that commitment scores were generally higher than centrality scores. Additionally, a main effect was obtained for issue, $F\ (1, 110) = 35.20, p < .001$, indicating that attitudes towards European Unification were generally stronger than attitudes towards Willem Alexander. However, these main effects were qualified by several higher order interactions. The strength Measure × Issue interaction was significant, $F\ (1, 110) = 36.91,\ p < .001$. Importantly however, the Issue × Repetition condition × Strength measure interaction was significant, $F\ (1, 110) = 7.32,\ p < .01$. In order to elucidate the nature of this three-way interaction, we conducted specific analyses for the commitment and centrality groups separately.

Commitment-related attributes of strength

Within the group of participants in which commitment was assessed, a 2×2 (Issue × Repetition condition) analysis of variance was conducted on the composite measure of commitment. The Issue × Repetition condition interaction was significant, $F\ (1, 64) = 11.02,\ p < .001$. No main effects were obtained. The interaction effect was in line with our hypothesis. For the group of participants who repeatedly expressed Willem Alexander attitudes, commitment to the Willem Alexander attitude was greater than commitment to the European Unification attitude, ($M = 5.1$ vs. $M = 4.5$). A reversed pattern was found for the group of participants who repeatedly expressed European Unification attitudes, ($M = 4.4$ vs. $M = 5.2$), for commitment to the Willem Alexander and European Unification attitudes, respectively. Thus, in line with the predictions, repeatedly expressed attitude were

[1] Similar results were obtained for raw scores.

associated with higher levels of commitment ($M = 5.1$), compared to attitudes that were expressed only once ($M = 4.5$).

Analyses concerning the separate items for certainty and likelihood of change showed similar results. A significant issue × repetition condition interaction effect was obtained for both measures, $F(1, 64) = 10.81$, $p < .01$, and $F(1, 64) = 7.75$, $p < .01$, for certainty and likelihood of change, respectively.

Centrality-related attributes of strength

In the same way, a 2 × 2 (issue × repetition condition) analysis of variance was conducted within the group of participants who responded to questions concerning centrality. This analysis revealed a main effect of issue, $F(1, 46) = 73.16$, $p < .001$, indicating that centrality was stronger for the issue of European Unification (4.2) than Willem Alexander ($M = 2.6$). No other effects were obtained. The issue × repetition condition interaction was not significant for participants in the centrality condition, $F < 1$, *ns*. Also, separate analyses for each of the three items did not reveal any effects of repeated expression, Fs $(1, 46) = .67$, 1.30, and .42, *ns*., for importance, relation to the self, and relation to personal values, respectively. Thus, also corroborating the hypotheses, results indicated that repeated attitude expression did not affect attitude centrality.

Mediation analyses

Next, in order to investigate the underlying process of the effects of repeated expression on commitment, we tested whether the effects of repeated expression on commitment were mediated by attitude accessibility. For mediation to occur, three conditions must be satisfied (Baron & Kenny, 1986). First, the independent variable should be reliably associated with the dependent variable. Second, the independent variable should be reliably associated with the mediating variable. Third, in a regression of the dependent variable on both the independent variable and the mediator, the independent variable should be significantly reduced, whereas the mediator should have a significant effect.

For these analyses, we followed procedures recommended by Judd, Kenny, and McClelland (2001) for mediation and moderation analysis in within-subjects designs.[2] Therefore, difference scores for accessibility were created by subtracting the transformed reaction times for Willem Alexander from the transformed reaction times for European Unification. Similarly, difference scores for subjective commitment were created by subtracting the Willem Alexander commitment scores from the European Unification commitment scores. Repetition condition was coded as a dummy variable (1 for rehearsal of the attitude towards Willem Alexander and 2 for rehearsal of the attitude towards European Unification).

Satisfying the first two criteria for mediation, repetition condition was significantly related to the difference scores of accessibility and commitment. The higher the frequency of attitude expression the higher the subjective commitment $\beta = .39$, $t(64) = 3.37$, $p < .01$, and the higher the accessibility, $\beta = .77$, $t(64) = 9.80$, $p < .01$. Moreover, the accessibility difference scores significantly correlated with the difference scores of commitment, indicating that higher levels of accessibility was associated with higher levels of commitment, $\beta = .47$, $t(64) = 8.67$, $p < .01$. Finally, when we controlled for the effects of attitude accessibility on the relation between repetition condition and commitment, the effect was reduced and became non-significant, $\beta = .11$, $t(63) < 1$, *ns*., while the effect of accessibility on commitment remained significant, $\beta = .42$, $t(63) = 2.39$, $p < .05$. This reduction was significant, $Z = 2.32$, $p < .03$. These latter analyses satisfied the third and final criterion for mediation to occur. The mediation analysis is depicted in Fig. 1.

Analyzing mediation for certainty and likelihood of change separately revealed parallel effects. Mediation was found to be significant for certainty, $Z = 2.01$, $p < .05$, and for subjective likelihood of change, $Z = 2.12$, $p < .05$. Together these findings show that the effects of repeated expression on subjective commitment are mediated by attitude accessibility. It corroborates

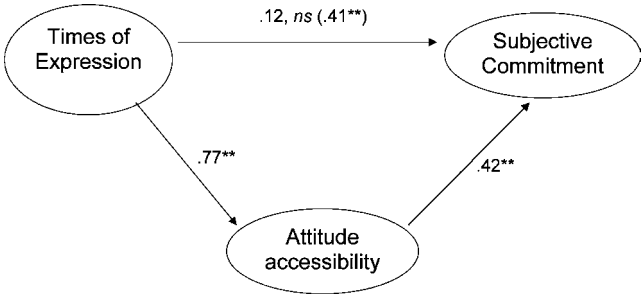


Fig. 1. Path analyses illustrating the mediating role of attitude accessibility on the relation between repeated expression and subjective commitment. The numbers represent standardized βs between repetition condition (dummy coded) and difference scores of accessibility and commitment of repeated and non-repeated attitudes. The parenthetic numbers represent the relation between repeated expression and commitment before controlling for accessibility. Higher scores represent higher strength.

[2] Following Judd et al. (2001), we also computed the sum scores of issues (across repetition conditions), for accessibility and commitment. Subsequent regression analysis showed no effects of the accessibility sum scores on the difference scores of commitment, indicating that the relationship between accessibility and commitment is homogeneous for both repetition conditions. In line with recommendations of Judd et al., the sum scores were left out in the subsequent analyses, in which difference scores were analyzed only.

our hypothesis that commitment-related attributes of strength might be inferred from the ease with which an attitude comes to mind.

Discussion

The present experiment contributes to the literature because it sheds light on the causal relation between attitude accessibility and the meta-attitudinal strength measures certainty and perceived likelihood of change, which have previously been studied as indicators of a strength dimension called commitment (e.g., Pomerantz et al., 1995). Our study provides the first empirical demonstration that attitude accessibility is a determinant of meta-cognitive judgments of commitment. Results showed that attitude certainty and perceived likelihood of change is enhanced after repeated attitude expression compared to single attitude expression. Moreover, our mediation analysis showed that the effect of repeated attitude expression on meta-cognitive judgments of commitment was mediated by its effect on attitude accessibility. These findings provide support for the proposition that the confidence with which an attitude is held may be inferred from the ease of attitude retrieval.

Second, the present experiment contributes to our knowledge with respect to the multi-dimensional structure of attitude strength. Whereas the results provide support for the idea that accessibility is a determinant of commitment-related attributes, the absence of effects for meta-cognitive judgments of centrality, such as importance and centrality to the self, suggest that these attributes have different origins. The latter finding largely replicates Bizer and Krosnick's (2001) findings. In line with our results, they also failed to find effects of attitude accessibility on attitude importance. In addition to importance, we showed that other centrality-related attributes also remained unaffected by repeated expression.

The absence of effects of repeated expression on centrality measures is considered here (and in the study of Bizer & Krosnick, 2001) to be a meaningful finding, indicating that meta-attitudinal strength measures related to centrality have different origins than meta-attitudinal strength measures related to commitment (e.g., Boninger et al., 1995a, 1995b). Alternatively, one might argue that this absence of effects may be due to the unreliability of our centrality measures. However, centrality measures that were used in the present research have shown their reliability and validity in several past studies. For example, it has been demonstrated that these centrality-related attributes significantly influence information processing (Pomerantz et al., 1995), the attitude–behavior relationship (Holland et al., 2003; Krosnick, 1988a), self-esteem (Holland et al., 2003), stability over time (Krosnick, 1988b) and many others (see for an overview Boninger et al., 1995a, 1995b). These findings counter unreliability as an alternative explanation of the null-findings.

In the introduction we mentioned a study by Roese and Olson (1994) that is seemingly inconsistent with the present findings. They showed that attitude rehearsal increased importance. The results of Bizer and Krosnick (2001) and the present findings suggest that the relation between repeated expression and centrality may not be very widespread. Nevertheless, the Roese and Olson study hints that at least on special occasions a relation between centrality related attributes and repeated expression might exist. What process might underlie this relation? As Bizer and Krosnick discussed this contradiction, repeated expression may elicit "different sorts of thoughts" (p. 581). In specific cases or circumstances in which these thoughts pertain to origins of importance such as values, self-interest or social identification (Boninger et al., 1995a, 1995b), it is theoretically quite conceivable that repeated expressions also strengthen the connection between aspects of self and the expressed attitude and, thereby, also enhance the centrality of that attitude. Note that the assumed process is quite different from inferring importance from the ease of attitude retrieval. Future studies, in which the self-relevance of the thoughts is manipulated within the repeated expression paradigm, e.g., by priming with important values (Verplanken & Holland, 2002) might provide more conclusive evidence concerning the processes through which repeated expression may affect centrality.

We have stated that people may use the ease of attitude retrieval to infer the subjective feeling of attitude certainty. Still, to our view these inference processes are unlikely to require effortful, deliberative information processing. Instead, the processes underlying the affects of attitude accessibility on attitude certainty may be based on intuitive heuristic processing. In line with researchers who have shown that high accessibility of knowledge may induce a 'feeling of knowing' (Kelly & Lindsay, 1993; Koriat, 1993; Schwarz & Clore, 1996), attitude accessibility may quite automatically signal a 'feeling of confidence.' Notwithstanding the present emphasis on intuitive processes related to feelings of certainty, attitude certainty can also be the result of analytic information processing. As Koriat and Levy-Sadot (1999) suggested, meta-cognition, including feelings of confidence, may be both influenced by intuitive and analytic processes. A recent study of Haddock and colleagues (Haddock, Rothman, Reber, & Schwarz, 1999) can be considered as a case in which confidence is influenced by subjective experiences of analytic rather than intuitive processing. More specifically, they showed that attitude certainty and other strength-related attributes were influenced by the subjective ease or difficulty to retrieve *arguments* underlying an attitude. In sum, it seems that subjective experiences of analytic processing,

e.g., searching memory for pertinent beliefs, as well as those of intuitive processing, e.g., the quick retrieval of a global summary evaluation, may influence meta-cognitive judgments of certainty. In future research, the circumstances and the relative contribution of intuitive versus analytic processes to feelings of certainty and other attributes of strength should be addressed.

Our findings concerning the impact of accessibility on certainty have implications for understanding the relation between these variables and strength-related consequences such as attitudinal effects on behavior and information processing and the stability of attitudes. The effects of certainty, reported in some studies (see for an overview, Gross et al., 1995) may in fact have been caused by differences in attitude accessibility. In these cases, certainty can be considered as an indirect measure of accessibility. Supporting this view, Bassili (1993) showed that although both attitude certainty and accessibility predicted voting behavior separately, after entering both these strength measures simultaneously in a regression it appeared that accessibility was the only significant predictor. Results like these suggest that certainty does not have consequences other than those caused by its interrelation with accessibility. However, in several theoretical perspectives meta-cognitive judgments of confidence are ascribed unique consequences. For example, judgments of confidence are considered to be a pivotal factor in relation to the depth of information processing (Chaiken, Liberman, & Eagly, 1989), learning and performance (Bandura, 1997; Ellis & Kruglanski, 1992), and the impact of persuasive messages (Petty, Briñol, & Tormala, 2002). Thus, although accessibility may determine certainty, the meta-cognitive feeling of certainty can be a more proximal determinant of these consequences. Future research should investigate the circumstances under which meta-cognitions of certainty or attitude accessibility are more proximal determinants of behavior, resistance, and attitude stability.

In conclusion, the present experiment aimed to investigate the largely unexplored area of the psychological processes and structural features underlying meta-attitudinal judgments of attitude strength. It was shown that meta-cognitive attributes pertaining to commitment, such as certainty and perceived likelihood of change may be signaled by attitude accessibility. The data suggest that, if we express an attitude over and over again, our attitude becomes increasingly accessible in memory. Consequently, we may hold this attitude with such great confidence that we are absolutely sure that we will never ever change our mind.

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