The feeling of familiarity as a regulator of persuasive processing

Teresa Garcia-Marques

ISPA - Lisbon

Diane M. Mackie

University of California, Santa Barbara

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Abstract

Two experiments demonstrated that a subjective feeling of familiarity determined whether participants processed persuasive information analytically (systematically) or non-analytically (heuristically). In the first experiment, individuals unfamiliar with message content showed differential attitude change when strong versus weak arguments were presented, whereas individuals made familiar with the message through unrelated repetition failed to do so. These results were confirmed in a second study that manipulated familiarity through subtle repetition and eliminated procedural priming explanations of the effect. Implications of these findings for familiarity as a regulator of persuasive processing are discussed.

The recent proliferation of dual process models in cognitive and social psychology reflects a considerable consensus that human information processing involves two distinct modes of computation (see Abelson, 1994; Sloman, 1996; Smith, 1994; Smith & DeCoster, 1999, for reviews). Although different in some significant ways, these models converge on the idea that individuals can make decisions or judgments about identical information on the basis of two distinct modes of processing.

One mode, which we term *non-analytic* processing, is characterized by access to previously stored knowledge. It operates outside of conscious control, with individuals typically aware only of the results of such processing. During non-analytic processing both the stimulus and/or its context cues simple heuristics or "feelings" regarding the stimuli. Examples of such processes are judgments that reflect the implicit use either of complex memory structures such as stereotypes, schemas, heuristics, and established attitudes, or of a simple memory trace (such as occurs in priming and repetition effects). Non-analytic processing is thus basically, top-down, automatic, uncontrollable, reproductive, quick, and implacable.

In contrast, analytic processing involves careful attention to the specifics of the situation and the explicit use of a criterion or rule to make judgments. Memory use is explicit since it provides access to information relevant for processing such as stimulus representations and the necessary symbolic rules (which tend to obey logical principles). Consequently this bottom-up analytic mode of processing is controllable, productive, deliberative, and relatively slow.

Support for dualistic models comes from studies indicating the functional independence (Tulving, 1983; Schacter & Tulving 1994) of both processes. In fact some research has demonstrated that each process can be impacted in different ways by the very same variables

(Chaiken & Maheswaran, 1994; Jacoby, 1991; Jacoby Toth, & Yonelinas, 1993; Jacoby, Woloshyn, & Kelley, 1989; Maheswaran & Chaiken, 1991).

The recognition that information can be processed in qualitatively different ways raises the question of process regulation. What factor or factors regulate processing mode activation or a switch from one more to the other? More specifically, how does the processor "know" which mode of processing is appropriate in any given situation (Sherman, 1987; Smith, 1994)?

Familiarity and processing mode

Processing mode selection has not been a primary focus of the dual process models developed in social psychology (see Smith & DeCoster, 1999, for a thorough analysis and Brewer, 1988; Chaiken, Liberman, & Eagly, 1989; Fiske, 1988, for exceptions). In the cognitive domain there has been more explicit emphasis on process regulation. Several models have suggested a match between input and memory, and a resultant implicit feeling of familiarity, as a mechanism that can regulate process mode activation.

Consider, for example, the role played by a "feeling of knowing" described by Reder and his colleagues in studies of problem solving (Reder & Ritter 1992; Schunn, Reder, Nhouyvanisvong, Richards, & Stroffolino, 1997). Reder and Ritter (1992) developed an experimental paradigm in which participants decided whether to retrieve or to calculate a solution to a problem and found that familiarity was the variable that mediated those decisions. Familiar situations (operationalized by number of exposures to kinds of problems) gave participants a "feeling" that they "knew" the answer, and thus promoted less effortful, top-down, retrieval strategies. Unfamiliar situations, in contrast, triggered more effortful bottom-up computational strategies. Further, when participants had practiced an arithmetic problem and were presented 24 hours later with similar but different problems (operator-

switch problems) they wrongly chose to retrieve the answer instead of computing it. Thus, a "feeling of knowing" caused by familiarity acted as a critical signal to switch the cognitive system between non-analytic and analytic processing modes.

The idea that processing is regulated by implicit awareness of familiarity is common to other approaches as well. Mismatch theory (Johnston & Hawley, 1994), for example, assumes that detailed processing of well-known, frequently encountered, or familiar situations wastes limited capacity that could be invested in other, particularly novel, situations. When stimulus situations match memory representations, initial bottom-up processing occurs with an "ease" or "fluency" that results in an (implicit) feeling of “similarity,” “recognition,” or “familiarity” (Eich, 1982; Fiske, 1982; Gillund & Siffrin, 1984; Higgins, 1989; Hintzman, 1988; Humphreys, Bain, & Pike, 1989; Jacoby & Dallas, 1981; Murdock, 1982). Whenever familiarity allows, situations are dealt more efficiently (with fewer resources) by non-analytic processing and bottom-up processing is turned down (although specific goals or tasks may induce more elaborative processing; see also Fiske, 1982, 1988; Fiske & Neuberg, 1990; Fiske & Pavelchak, 1986; Neuberg & Fiske, 1987). Thus, these models suggest that what regulates processing mode activation is a feeling that varies continuously in intensity (Yonelinas, 1994) depending on the ease or fluency with which the stimulus is processed (Jacoby, 1988; Jacoby & Kelley, 1990; Scherer, 1984). Fluency promotes a feeling that the situation can be dealt with on the basis of what is already known, and thus that non-analytic processing is appropriate.

The idea that familiarity promotes non-analytic processing has received considerable empirical support. For example, both the frequency and recency of memory trace activation increases the likelihood of top-down processing (Fazio, Powell, & Herr, 1983; Higgins, Bargh, & Lombardi, 1985; Sherman, Mackie, & Driscoll, 1990; Smith & Branscombe, 1987;

Srull & Wyer, 1979). Top-down priming effects have also been shown to depend on prime-stimulus similarity (Smith & Branscombe, 1987; Smith, Branscombe, & Bormann, 1988; Smith, Stewart, & Buttram, 1992). Several pieces of evidence suggest that using established general knowledge structures facilitates apprehension of the gist of the situation but inhibits memory for its details (see e.g. Grasser, 1981; Schank & Abelson, 1977; von Hippel, Jonides, Hilton, & Narayan, 1993). At the same time, unexpected (unfamiliar) information triggers detail-oriented processing (Johnston & Hawley, 1994; Stangor & McMillan, 1992; Rojahn & Pettigrew 1992, for reviews).

Research on the impact of expertise also offers some instructive findings. Experts are by definition people very familiar with a specific highly related set of information. In the presence of input related to their expertise, they engage in less effortful processing, relying on essentially top-down processing. In contrast, non-experts engage in bottom-up processing (Arkes & Freedman, 1984; Chase & Simon, 1973; Egan & Schwartz, 1979; Reder & Anderson, 1980; Schmidt & Boshuizen, 1993).

In sum, the evidence suggests that a subjective feeling of familiarity impacts information processing such that increased familiarity triggers non-analytic processing whereas lack of familiarity triggers analytic processing (see Johnston & Hawley, 1994, for a review). When a stimulus matches a memory trace, processing fluency is increased. Thus a re-encountered stimulus is processed more easily than it was during its first encounter. This fluency or ease of processing, experienced as a feeling of familiarity, indicates that the situation can be dealt with on the basis of what is already known, and thus that non-analytic processing is appropriate.

Implications for persuasion

On the basis of this research, we propose that the subjective feeling of familiarity can also regulate processing of persuasive material, determining whether persuasive appeals are processed non-analytically or analytically. The field of persuasion offers a privileged context to approach questions regarding dual processing, because paradigms developed to test dual process models (like the Heuristic-Systematic Model, Chaiken, 1980, 1987, and the Elaboration Likelihood Model, Petty & Cacioppo, 1986) are so well established. Presenting participants with messages comprising either weak and specious or strong and compelling arguments is consensually accepted as a mean of assessing the use of one of the two processing modes (e.g. Chaiken & Maheswaran, 1994; Petty & Cacioppo, 1986; Petty, Wells, & Brock, 1976). A differential impact of weak and strong arguments on attitude change (where strong arguments produce attitude change and weak arguments do not) is taken to indicate that the persuasive message benefited from extensive elaboration and thus analytic processing. If, in contrast, attitude change is unrelated to argument quality, it can be assumed that the persuasive message received more superficial or non-analytic processing.

To demonstrate the effect of familiarity on persuasion processing mode, we performed two experiments in which some participants were exposed to the persuasive message more than once. Consistent with the literature (Begg & Armour, 1991; Jacoby, 1991; Reder & Ritter, 1992) we used multiple exposures to induce a feeling of familiarity. When participants were asked to read the message with the intent of forming an opinion about the issue, we expected participants for whom the message was unfamiliar to process analytically, elaborate on its content, and thus to show differential reactions to strong and weak messages. No such differentiation was expected for participants to whom the message felt familiar, indicating non-analytic processing.

Experiment 1

To test the hypothesis that familiarity promotes non-analytic processing we exposed some of our participants to the persuasive message multiple times. Several measures were taken to prevent participants focusing explicitly on these multiple exposures and from thoroughly processing the message content on their first exposure, while allowing them full capacity to do so when attitudinal judgments were elicited. First, the message addressed an issue that was of relatively low interest and involvement. Second, message repetition was interspersed with required judgments and each repetition had to be processed with a different non-semantic processing goal in mind. Third, participants formed an opinion about the attitude issue in a self-paced task quite separate from those related to their previous exposures to the message.

We operationalized familiarity by exposing participants to the message zero, one, two, or four times. Our choice of four levels of repetition was exploratory. Our primary hypothesis was that the non-repetition condition would differ from those in which the message was repeated. However, we had no a priori expectations regarding how many repetitions would be necessary to induce a subjective experience of familiarity about the message (especially given that this cut point might vary with context, as suggested by Yonelinas, 1994).

Method

Participants and Design

One hundred twenty UCSB undergraduate students (85 females and 45 males) received $10 to participate in the experiment. Participants were randomly assigned to the cells of a 2 (strong or weak message quality) X 4 (0,1,2, or 4 repetitions) between groups factorial design.

Procedure

Three to six students participated in each session. Initial instructions informed participants that they would be involved in two different studies, the first of which involved evaluating some stimulus materials for use in a future study. As these materials were to be presented by computer, participants were seated individually in visually isolated booths in front of an IBM-PC and a tape recorder. Computer-generated instructions then diverged depending on experimental condition. With the exception of those in the no repetition condition, participants were asked to don headphones so that they could listen to a recorded message. A yellow dot indicated the channel on which the message would be presented and participants were instructed to put on the headphones so the active channel was presented to their left ear if they were right handed and to their right ear if they were left handed.[1]

Participants were then asked to evaluate some of the message's features. They were not informed in advance about the number of times they would be invited to listen to the message, nor the particular feature(s) that they would be required to evaluate. After putting on the headphones, participants pressed the space bar on the computer keyboard to receive a processing goal (that is, the feature to be evaluated) and then pressed a play button to initiate the computer-presented audio message.

Presentation of weak versus strong arguments. Participants heard a female voice delivering a message that argued against the implementation of governmentally enforced controls on American industry in order to minimize the effects of acid rain on the North Eastern states. Participants heard a message containing either strong arguments (68 seconds) or weak arguments (62 seconds) on this topic (see Worth & Mackie, 1987, for details). Pretesting revealed that UCSB students were not especially involved with the issue ($\underline{M}$=5.05, $\underline{SD.}$ = 2.46 on a 9-point scale where 9 indicated high involvement) but that 77% of them favored

mandatory governmental controls (M= 6.99, SD= 1.61 on a 9-point scale where 9 indicated extreme agreement). The presented message was thus counterattitudinal.

Message repetition. The end of the message was marked by a beep that prompted participants to press a stop button and follow further instructions on the computer screen. They were then asked to evaluate the tape in terms of the relevant feature using the keyboard to respond to a seven-point scale with appropriately labeled endpoints. In multiple presentation conditions, this response then generated presentation of a new processing goal, repetition of the same (strong or weak) message, and the procedure was repeated. The evaluation features (and the rating participants were asked to make) were: sound quality (poor-good); pitch of the voice (very low-very high); pace at which the message was read (very slow-very fast); clarity of pronunciation (very bad-very good) and eloquence of expression (very dull-very vivid). Except for those in the no repetition condition, participants listened to exactly the same message and made judgments 1, 2, or 4 times. Each processing goal was presented an equal number of times at each repetition level (the order in which goals were presented was kept constant).

Dependent Measures

All participants (including those in the no repetition condition) then read on the computer screen a written version of either the strong or weak message (experimental subjects received the same strong or weak message to which they had previously been exposed). They indicated the extent of their agreement with the idea that the government should impose the controls in question by using the key pad to respond to a seven-point scale anchored at the low end by "strongly disagree" and at the high end by "strongly agree". Participants then completed an unrelated study, at the end of which they responded to a “post-experimental questionnaire” that gauged how aware participants were of the hypothesis under investigation.

Results and Discussion

One participant guessed the persuasive intent of the experiment in the post-experimental questionnaire and her responses were excluded from further analysis. Preliminary analyses indicated that the different processing goals used to manipulate familiarity did not differ and analyses reported here collapsed across this aspect of counterbalancing. Attitude scores were reversed so that high scores indicate greater acceptance of the advocated position.

To test the hypothesis that familiarity promotes non-analytic superficial processing, we computed three orthogonal contrasts defined by the Helmet contrast matrix (Kirk, 1982). The first component of this partition of the variation assumed differentiation of responses to strong and weak arguments in the no repetition condition and no such differentiation in conditions in which repetition occurred (contrast weights were -3, 3, 1, -1,1, -1,1, -1). The contrast was indeed significant, indicating that participants in the no repetition condition exhibited greater elaboration than participants in conditions in which repetition occurred, $t(111)= 1.74$, $p < .043$, $MSe=1.54$, see Figure 1. This difference explained 99.3% of the joint effect of the two factors. Thus, we did not expect any differential effects on attitude change in either of the other conditions. In fact neither the second (0, 0, -2, 2, 1, -1, 1, -1) nor the third (0, 0, 0, 0, -1, 1, 1, -1) components of the Helmet matrix were significant ($F<1$). These results indicated that even low levels of familiarity (one repetition only) eliminated the differential impact of strong and weak messages on attitudes.

Insert Figure 1 here

To ensure that repetition caused participants neither to read the message with less attention nor to consider their attitudinal judgments less carefully, we analyzed message

reading time and attitude judgment latency (log latencies) across conditions. The results of a 2 (message quality) x 4 (number of repetitions) ANOVA indicated that the weak message was read more quickly (M = 59secs) across conditions that the strong message (M = 70secs; t(111) =2.64, p<01, Se = 4.17), as might be expected given the relative length of the messages. No other effects were obtained for either dependent variable. However, since previous exposures to the message could induce progressively faster reading of the message, we performed a further analysis by comparing reading times across repetition levels. Although the means suggested a linear trend (68, 65, 63, 61) the pattern was not significant; nor was the contrast between the no-repetition and all other conditions combined. Thus the differences in attitude caused by repetition did not seem readily attributable to any other processing mediator.

These results were strongly consistent with our hypothesis. The implicit feeling that the message was familiar was expected to reduce elaboration that would otherwise produce differentiation between a strong and weak message. It apparently did so, as participants for whom the message had been repeated failed to show attitude responses that differentiated strong and weak arguments, in contrast to participants in the no repetition condition. In this situation even a single repetition was apparently sufficient to make the stimulus seem "familiar enough" (that is, the familiarity threshold was very low). Thus even those who received a single repetition of the message showed no differentiation between strong and weak arguments, and further repetitions did not change these results. Of course, a stronger activation of the feeling of familiarity (a higher threshold) might be required to trigger top-down processing in more highly involving or demanding situations.

Although the data were consistent with our predictions that the subjective experience of familiarity would lead individuals to engage in non-analytic processing, we wished to

replicate this effect and eliminate a possible alternate explanation before drawing firm conclusions. Recall that to manipulate familiarity, we had participants make one or more non-semantic judgments of the material in the persuasive message. Only superficial processing of the material was necessary to make those judgments. Inadvertently, then, our procedure could have induced "procedural priming" or "transfer of appropriate processing" (Roediger & Blaxton, 1987; Smith & Branscombe, 1987). The way in which participants were led to deal with the material to make the non-attitudinal judgments may thus have primed superficial processing of the attitudinal judgments. We wished to eliminate this possible alternate explanation for our findings.

Experiment 2

To do so we designed an experiment intended to both manipulate familiarity through subtle message repetition and ensure that any procedure that might be primed during repetition would be analytic rather than superficial. As in Experiment 1, strong and weak versions of the target message were presented aurally during the first, repetition, phase, and in written form when participants later make their attitudinal judgments. During the repetition phase, some participants were instructed to listen to the tape recorded target message "as background noise" while concentrating on forming an opinion about strong or weak versions of a completely different message presented simultaneously on the computer screen. Given the careful distinction made between the main (form an opinion) task and the secondary (background noise) task, we expected participants to differentiate between strong and weak versions of the written message in this phase (Eagly & Chaiken, 1993). Thus repetition occurred without participants being focused on it, and the type of processing that was primed was the kind of elaborative processing that would make more likely attitudinal differentiation of strong and weak messages. Following the repetition phase, the target

message was presented on the computer screen and participants were asked to form an opinion regarding it. We then measured both reports of valence of actual feeling state and attitudinal judgments.

If procedural priming or transfer of appropriate processing occurs, the elaborative mode of processing primed during the repetition phase should be transferred to the attitude judgment phase. Attitudes toward the target message should then be even more likely to reflect the differential impact of the strong and weak versions of the message. In contrast, the familiarity as a regulation mechanism hypothesis predicted that participants made familiar with the message during the repetition phase would not elaborate on its content when asked to form an opinion on the issue.

Method

Participants and Design

Participants were 203 UCSB students (142 females and 61 males) paid $10 for their participation. Participants were randomly assigned to one of the 16 different conditions that resulted from a 2 (weak or strong priming message) x 2 (weak or strong target message) x 2 (repetition or no repetition of target message) x 2 (attitude or valence of feeling measure assessed first) between participants design.

Procedure

Assessment of initial attitudes. Groups of 3-6 participants per session were told that they would be involved in "a study that focuses on the consequences on performance of doing two tasks at once," instructions for which would be presented at the appropriate time by computers. Participants were then seated individually in visually isolated booths, where IBM-PCs presented all experimental material and instructions. Using the cover story that some extraneous variables needed to be controlled in the study, the experimenter asked

participants to complete two questionnaires. The first set of questions requested demographic characteristics (gender, class, age, deafness or difficulty in hearing) and the second questionnaire assessed opinions and feelings about several attitude issues.

Participants were instructed in the use of a feeling thermometer as follows:

> *Like a regular thermometer, a feeling thermometer measures everything from cold to hot. You can use the feeling thermometer to show how "cold" or "hot" you feel about various things. If you disagree or dislike something, you can give it a "cold" rating, choosing a temperature somewhere between 0 and 49. On the other hand, if you like or agree with something you can give it a "hot" rating somewhere between 51 and 100.*

Participants then used the "thermometer" to express their feeling towards several statements. There were two key statements: "*The government should impose controls on industry to help minimize the effect of acid rain in US*" (the target issue) and "*Weight Loss Centers are places where people can safely and effectively lose weight"* (the issue used in the priming phase).

Presentation of priming message and manipulation of repetition. Further instructions informed participants that there were two different experimental conditions. In one condition, participants would perform two tasks simultaneously (the repetition condition), whereas in the other condition participants would perform two tasks sequentially (the no repetition condition). The computer randomly assigned participants to condition, and computer-presented instructions then diverged by condition. Participants in the repetition condition were told:

> "*You will be given two tasks: a reading task and a listening task. Your main, first, and most important task is the reading one. That is the task we want you to attend to. It is your task. The hearing task is your secondary task, and simulates your environment. We expect you to listen to it, but you should not be concerned with it. Do not in any case interrupt your reading to attend to the tape-recorded message. Remember that your main task is the reading task. Now please put on the headphones and press the 'play' button on the tape recorder to start your listening task and the space bar on your computer to start your reading task.*"

Participants in the no repetition condition read only the part of the instructions that urged them to read the presented message carefully.

All participants were then presented with a strong or weak message arguing the benefits of commercial weight loss centers (see Rosselli, Skelly, & Mackie, 1995, for details). Pretesting indicated that these messages were highly likely to be counterattitudinal to the vast majority of UCSB students. In addition, participants in the repetition condition heard at the same time a strong or weak version of counterattitudinal message regarding acid rain used in Experiment 1. The acid rain messages were designed to be slightly briefer than the weight loss messages.

Attitudes toward priming issue. Immediately following presentation of the weight loss center message we assessed participants' attitudes about weight loss centers. Three related items were presented on successive screens: *Weight loss centers are places where people can safely lose weight; Weight loss centers offer good support to those who want to lose weight; Weight loss centers do not offer ways of efficiently losing weight.* The feeling thermometer that participants used to express their opinions accompanied these items. Thus attitudes regarding the weight loss priming issue were assessed after participants had read either a strong or weak message either alone or in the presence of another (target) message.

Presentation of target message and manipulation of argument quality. A strong or weak version of the target acid rain message was then presented on the screen. Participants in the no repetition condition regarded the careful reading of this message and expression of opinions about it as the second part of their sequential task. Participants in the repetition condition were told that some of them (in fact all of them) had been selected to give their opinions regarding the issue presented as background noise: they were to read the message now presented on the screen and express their opinion on it.

Dependent measures

After reading the acid rain message, participants completed attitudinal and mood measures. Attitudes toward the acid rain issue were assessed using the items and feeling thermometer instrument described earlier. Mood measures were included in Experiment 2 to help assess whether simultaneous exposure to two messages in the experimental conditions invoked negative affect reflecting fatigue, overload, or irritation. Two 9-point scales assessed valence of activated feelings. The first asked, "*How do you feel right now*?" and participants responded on a scale anchored with sad at the low end and happy at the high end. The second item asked participants "*How would you describe your mood at this time*?" and was accompanied by a scale anchored with “bad” at the low end and “good” at the high end. Half of the participants first expressed their attitudes and then responded to the mood assessment, whereas the other half of the participants responded first to the mood assessments and then expressed their opinions regarding acid rain.

All participants returned to a reception room where they completed a small survey about their experiences and were then debriefed, paid, and thanked for their participation.

Results and Discussion

A computer malfunction during three participants' data collection and the elimination of seven participants who were familiar with the persuasive aims of the study led to final analysis of data from 193 participants (4 participants were lost from the no repetition condition and 6 from the repetition condition). The fact that some participants failed to use an appropriate response key produced some missing values, explaining the variation in reported degrees of freedom. To simplify data presentation all thermometer-based attitude measures were re-scaled to a 0-10 scale. An initial analysis revealed that, as expected, both priming and target issues messages were counterattitudinal. Participants were initially equally

opposed to weight loss centers in the no-repetition (M= 4.38) and repetition (M= 4.75) conditions, and favored mandatory government control of acid rain equally in the no-repetition (M = 8.16) and repetition (M = 7.81) conditions. Target issue attitude responses were reversed so that higher scores reflected greater agreement with the advocated position.

Attitudes on the priming issue. Given that instructions stressed the importance of attending carefully to message content, we expected participants in both the repetition and no repetition conditions to process the information about the weight loss issue systematically, and thus to show similar differentiation of attitudes following strong and weak arguments. To test this hypothesis a 2 (strong or weak message quality) x 2 (repetition or no repetition) ANCOVA was performed on the average of the three items measuring attitudes toward weight loss centers (Cronbach's alpha = .69; confirmatory factor analysis revealed a single factor solution that explained more than 62% of the total variance) with initial attitudes on the issue as a covariate. The impact of the covariate was significant, $F(1,188) = 81.50$, $p<.0001$, MSe = 1.84. As predicted, participants reacted differently to strong and weak versions of the persuasive message, $F(1,188)=11.79$, $p<.0007$. Participants agreed with the issue more after exposure to the strong message (M=6.99) than exposure to the weak version (M= 6.31). The lack of a significant interaction ($F<1$) between level of repetition and argument quality suggested that all participants processed the message systematically, see Figure 2. This analysis also revealed a main effect, $F(1,188)=10.06$, $p< .002$, indicating that participants agreed more with the message when they performed a simultaneous task (M=6.96) than when they did not (M= 6.33).

Insert Figure 2 about here

Valence of feeling assessment. Responses regarding participants' feelings (sad-happy) and their moods (bad-good) were highly correlated (r= .72) and were averaged to form a valence of feeling index (preliminary examination revealed an extreme outlier which was removed from this analysis, N=192). This index was entered in a 2 (weak or strong argument quality) x 2 (repetition or no repetition) x 2 (order of measurements) between subjects ANOVA. Repetition interacted with the order in which attitudes and valence of feelings were assessed, $F(1,183)=9.57$, $p<.002$, MSe = 1.97. Far from triggering negative affect, repetition improved mood ratings (M= 5.51) compared to no repetition (M = 4.51) but only when feelings were measured before attitudes were, $t(183)= 3.54$, $p<.0001$. When valence of feelings was measured after attitudes the differences were not significant, M=6.24 and M=6.49, $t < 1$. The order of assessment also influenced participants' overall feelings, $F(1,183)=44.88$, $p<.0001$. Expressing attitudes promoted positive feelings in all participants (M=6.37) compared to when feelings were measured before attitudes (M= 5.01), see Figure 3. These results were compatible with the idea that task completion induces positive feelings (Simon, 1969; Wyer & Srull, 1989).

Insert Figure 3 about here

Attitudes on the target issue. The three items used to measured attitudes towards the acid rain issue were correlated (Cronbach's alpha = .65) and loaded on a single factor that accounted for slightly more than 60% of the total variance. These three items were averaged to form a single post-message attitude index.

Our primary hypothesis was that participants for whom the target message was familiar (because of repetition) would fail to process it in as analytic fashion as would those participants for whom it was not familiar. Thus we expected participants in the no repetition

condition to respond with attitudes that reflected the strength or weakness of the target message arguments, whereas participants in the repetition condition were not expected to show this pattern.

To test this hypothesis post message attitude index scores were entered into an ANCOVA defined by a 2 (strong or weak argument strength) x 2 (repetition or no repetition) x 2 (order of attitude and valence of feelings measurement) factorial with initial attitude on the target issue as a covariate (preliminary examination revealed the presence of an extreme outlier that was removed from the analysis; with missing values, N=188). As expected, initial attitudes were related to participants' post-message attitudes, F(1, 179)=32.52, p<.0001, MSe = 2.10.

The results indicated a main effect of argument quality, F(1,179)=5.08, p<0.03, qualified by the expected interaction with familiarity, F(1,179)=4.77, p<.03 (see Figure 4). A planned contrast indicated that participants in the repetition condition seemed not to react differently to the presence of strong (Adjusted M=4.47) or weak (Adjusted M = 4.45) messages, t(179) <1. Thus the argument quality main effect was due primarily to the fact that no-repetition participants were much more persuaded by the strong message (Adjusted M=4.51) than by the weak message (Adjusted M=3.57), t(180)= 3.25, p<0.001. Participants in the no repetition condition also agreed less with the advocated position (Adjusted M= 4.04) than participants in the repetition condition (Adjusted M= 4.46), F(1,179) =3.88, p<.05. [2]

Insert Figure 4 about here

Latency measures. Reading and reaction times were analyzed to test additional hypotheses. First, participants in the repetition condition (who heard the target message while reading the

priming message) were expected to take longer to read the priming message than those in the non-repetition condition, who had no dual task. Participants in the repetition condition took an average of 3.31 minutes to read the weight loss message compared to participants in the no repetition condition, who took 2.80 minutes, confirming the hypothesis, $F(1,188)=16.165$, $p<0.0001$, $MSe = .789$. Since participants in the repetition conditions had already been exposed to the target message, we again assessed their processing time compared to those in the no repetition condition. Processing in the repetition condition was faster ($M=1.04$) than in the no repetition condition ($M= 1.14$), $F(1,188)= 4.57$, $p<.034$, $MSe = .098$. Importantly, the magnitude of the difference did not suggest that the repetition group failed to read the message altogether, but merely that they were faster to do so. The two groups did not differ in their latencies to express their attitudes ($F<1$).

As in Experiment 1, participants experiencing familiarity showed no attitudinal differentiation between strong and weak versions of a persuasive message, suggesting that familiarity is associated with more superficial non-analytic processing. In addition, the design of Experiment 2 eliminated the alternate explanation of this finding based on procedural priming effects.

General Discussion

Results from several different areas of cognitive research suggest that the subjective experience of familiarity triggers non-analytic processing. Taken together, the results of the two experiments reported here provide evidence that this experience of familiarity produces similar effects in the persuasion domain. Experiment 1 showed that in contrast to recipients unfamiliar with a persuasive message, participants dealing with familiar persuasive information processed it non-analytically. Experiment 2 replicated this effect while eliminating an alternative explanation based on procedural priming. Our data thus provide the

first evidence in the persuasion domain to corroborate the idea that a feeling of familiarity regulates how information is processed.

These conclusions depend on our having manipulated the feeling of familiarity associated with a persuasive appeal by varying message repetition, as done previously in the literature. The extent to which participants were aware of this manipulation probably differed in the two experiments. In Experiment 1, most participants were probably explicitly aware of having been exposed to the persuasive message before. However the manipulation in Experiment 2, which produced identical effects, did approach more closely manipulations of the feeling of familiarity that are less conscious and less vulnerable to mediation by other factors. Together the experiments support the idea that the subjective experience of familiarity was responsible for the effects we found. Nevertheless, initial presentation of arguments outside of conscious awareness would ensure that feelings of familiarity were engendered by repeated presentation, and not by knowledge of that repetition.

Of course the most direct test of the mediational role of familiarity requires both measurement of participants' feelings of familiarity and within condition processing mode assessment. Both of these ideals are currently quite difficult to attain. First, adequate measures of familiarity are lacking. Explicit questions about prior exposure are likely to call attention to previous presentation as the source of the subjective feeling, disrupting the effect (Jacoby, Kelley,& Dywan, 1989; Schwarz & Clore, 1996). Given that our mood measures were impacted by repetition, they might provide an indirect measure of familiarity. However the order effect associated with this variable invalidates possible mediational analyses. In other studies we (Garcia-Marques, 1999; Garcia-Marques & Mackie, 2000) have used dependent measures from other studies of familiarity to establish the presence of the appropriate feeling before assessing a new dependent variable. But such a strategy depends

crucially on accommodation of the original method to the new experimental context, especially one as sensitive as the persuasion paradigm.

The second problem in assessing mediation in this paradigm is the use of a between subjects manipulation of argument quality to index processing mode. Although this technique has the advantage of being well replicated and researched, inferring processing mode from a between conditions interaction makes extracting variability from this effect using familiarity as a covariate impossible. Future research needs to address both these issues.

Interpreting these results as showing that familiarity induces non-analytic processing also depends on elimination of other possible contributors to the effects we obtained. One such alternative might be that the experimental groups in our studies processed the target message heuristically because they were bored, fatigued, or overloaded either because they had performed more tasks (Experiment 1) or been exposed to more information (Experiment 2) than control subjects. Several aspects of our data argue against this possibility. First, in Experiment 1, the familiarity effect was obtained after a single repetition of the relatively short (just over a minute) message. Second, statistically identical reading and response times and familiarity effects were obtained in Experiment 1 whether participants were exposed to one, two, or even five repetitions.

Third, experimental participants In Experiment 2 were as fully able and willing as control participants to elaborate the priming message, good evidence against the possibility that they were overloaded, even during simultaneous message presentation, let alone after it. Finally, results from Experiment 2 showing that message repetition participants were happier than control participants argues against the idea that they were tired, bored, or annoyed even

at this late stage in the procedure. Thus it seems unlikely that these aspects of the methodology determined the experimental outcomes.

A second possibility is that our results are due to social judgeability effects (Yzerbyt, Schadron, Leyens, & Rocher, 1994; Yzerbyt, Dardenne, & Leyens, 1998) rather than familiarity. According to a social judgeability perspective, people feel justified in relying on a heuristic – like a previously established attitude -- to make a judgment (even if normally they wouldn't do so) because they believe they have already gained specific information about the target (during earlier exposures).

There was certainly little evidence that repetition participants relied on initial attitudes to make their judgments. First, attitudes in the repetition conditions of Experiment 2 were less likely to reflect participants' prior attitudes than those expressed in the no repetition conditions. In addition, the time it took participants to report their attitudes did not differ in the repetition and no-repetition conditions in either Experiment 1 or Experiment 2, suggesting that attitudes were no more accessible in the repetition conditions. Nevertheless, stronger evidence for the role of familiarity per se could come from paradigms in which repeated exposure was subliminal or delayed so that participants had no conscious recognition of prior exposure. In this case, the use of heuristic judgments is unlikely to be due to social judgeability, since participants' conscious belief that they have received relevant information is a prerequisite for that effect.

The results of these experiments appear at first glance to be inconsistent with earlier studies which also manipulated message repetition (Cacioppo & Petty, 1979, 1989). Cacioppo and Petty asked participants to evaluate the sound quality of a tape prepared for possible broadcast in the university community. Participants listened to either strong or weak versions of a message regarding the issue of comprehensive exams. Some participants heard

the personally relevant message once and others three times in succession (Cacioppo & Petty, 1989) or some heard it once, three, or five times (Cacioppo & Petty, 1979) and immediately expressed their opinions. Under these conditions, up to three repetitions apparently led to greater elaborative and analytic processing of the message, so that repetition increased the differential persuasive impact of strong relative to weak messages (with more exposure message agreement decreased). The authors interpreted this effect as reflecting an increase in elaborative processing with initial repetitions (followed by tedium). In these studies, then, rather than triggering non-analytic processing, repetition apparently made possible increased systematic processing.

One factor that might explain these divergent outcomes is methodological. Cacioppo and Petty (1989) gave participants their processing goal, presented their repetitions of the message in close and continuous succession and asked participants to complete a task -- reporting their attitudes -- that did not require re-attention to the message. Given that the feeling of familiarity depends on a match between current input and the activation of an already established memory trace, it may be that this particular way of presenting the message did not create such a match, and therefore did not induce familiarity or non-analytic processing. Ironically, if repetitions of their messages had been spaced rather than massed,[3] their repetition of messages identical in content and medium should have been maximally appropriate for a memory match. The importance of this methodological difference to the familiarity effect can be assessed by manipulating massed versus spaced repetitions in future studies.

It is also possible, however, that the fluency produced by repeated exposure might both invoke familiarity (and thus heuristic processing) and at the same time increased capacity for systematic processing. What variables might then determine which of these

processes is more favored, so that under different circumstances repetition-induced systematic processing of message content or familiarity-induced heuristic processing might predominate?

The most likely candidate appears to be message importance or relevance. Message importance and relevance may play two important roles in effecting the impact of repetition on processing. The first possibility is that when messages are highly relevant and important, motivation for elaboration is very high and even if repetition produces a feeling of familiarity, the motivation to process overwhelms it, and repetition's main role is to provide an opportunity for this increased processing. Cacioppo and Petty's college participants considered an issue of high personal relevance (comprehensive exams) and were further told that their attitude judgments could have an important impact on university policy. Both these factors induce a high degree of motivation to process message content spontaneously (Hastie & Park, 1986; Johnson & Eagly, 1989). In contrast, we chose an issue of only moderate importance, and participants made judgments that they thought were mere pre-testing of stimulus materials for a future study. Such motivational differences may well account for the differences in findings (Cortlett, 1984), suggesting that the familiarity effect might hold for messages of moderate or low importance, whereas repetition might promote systematic processing with highly relevant and important messages.

Relevance and importance may also affect the impact of familiarity on processing because importance and relevance make familiarity harder to achieve. Because high importance and relevance increases initial detailed attention to and detailed processing of a message, it may be more difficult to achieve a match between a memory representation and this focal stimulus (as Fiske, 1988 and Eagly & Chaiken, 1993 suggest), thus raising the familiarity threshold. Certainly it might be expected that a single repetition would not induce

a feeling of familiarity: for important messages, several repetitions may be necessary before a feeling of familiarity, and thus heuristic processing was triggered. Framing the issue this way also raises an intriguing possibility - when Cacioppo and Petty found after several repetitions a drop-off in systematic processing, was it due to the onset of fatigue and boredom, or the final broaching of the familiarity threshold? Research designs more specifically focused on measures assessing familiarity will be necessary to further clarify the interplay of motivation and repetition on processing.

With the impact of familiarity so central in other domains of information processing, it is not surprising that it should also play such a role in persuasion processing. A growing literature documents the multiple roles that familiarity can play in the persuasion domain. On the one hand, familiarity can directly influence the evaluation of attitudinal objects, as is demonstrated by the mere-exposure effect (Bornestein, 1989; Zajonc, 1968). At the same time, Begg and Armour (1991) and Arkes, Boehm, and Xu (1991) have demonstrated that familiarity can be a basis for judging the truth of statements, thus suggesting that familiarity influences the perceived quality of persuasive arguments (Sawyer, 1981). Similarly, Howard (1997) suggested couching arguments in familiar terms increased their persuasive power when individuals processed non-analytically. Our findings contribute to this literature by suggesting that familiarity also influences the way in which persuasive information is processed, with familiar information not receiving the same intense scrutiny that unfamiliar messages may attract.

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Footnotes

1. This was done to control for any possible effects of lateral organization on persuasiveness. Previous studies (Drake, 1981; Drake & Bingham, 1985) suggest that presentation to the left cerebral hemisphere of right-handers increases resistance whereas presentation to their right hemisphere decreases resistance, with the reverse being true for left-handers.

2. The presence of an only marginal interaction, $F(1, 78) = 3.68$, $p = .06$, suggested that participants' post-message attitudes might be slightly more related to initial attitudes in the no-repetition condition (Beta =.502; $t(96) = 5.69$, $p < .0001$, Se=0.08) than in the repetition condition (Beta =.230; $t(82) = 5.69$, $p < .02$, Se=0.08). Given that non-analytic processing is characterized by activation of and reliance on previously established mental representations, this result may be seen as surprising. However, prior attitude is not the only, or even necessarily the most potent, established knowledge structure that might affect attitudes, especially moderate or weak attitudes. As noted earlier, any aspect of the persuasive message or setting might trigger any already established persuasion cue. For example, both strong and weak messages contained approximately the same raw number of arguments in our setting, suggested equally knowledgeable sources, and contained the same number of references to numbers and data. At the same time, those engaged in analytic processing are expected to consider new information together with their previous opinion, and many indices of analytic processing (such as elaboration) may be biased by such established opinion. Because this marginal result raised the possibility that the two regression lines may not be parallel, the probability values associated with rejection of the Ho assumed in the ANCOVA model might be over or under-estimated. In fact graphical analysis suggested that the reported effect held only for those participants for whom the message was in fact counterattitudinal. Note,

however, that the possible lack of parallelism associated with the repetition factor does not affect or undermine the interpretation of the reported interaction of this variable and argument quality, $F(1,176) = 1.3$, $p = .26$.

3. Massed repetition is known to have a different effect than repetition that is spaced in time. This outcome has been obtained in a wide variety of memory tasks, using several dependent measures, but none of the current explanations for it enjoys general consensus (see Hintzman, 1988, for a review).

Author Notes

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Correspondence concerning this manuscript should be addressed to Teresa Garcia-Marques, Instituto Superior de Psicologia Aplicada, Rua Jardim do Tabaco, 44, 1100 Lisboa Portugal. Electronic mail may be sent to gmarques@mail.telepac.pt

Figure 1. Post-message attitudes as a function of message repetition and argument quality, Experiment 1.

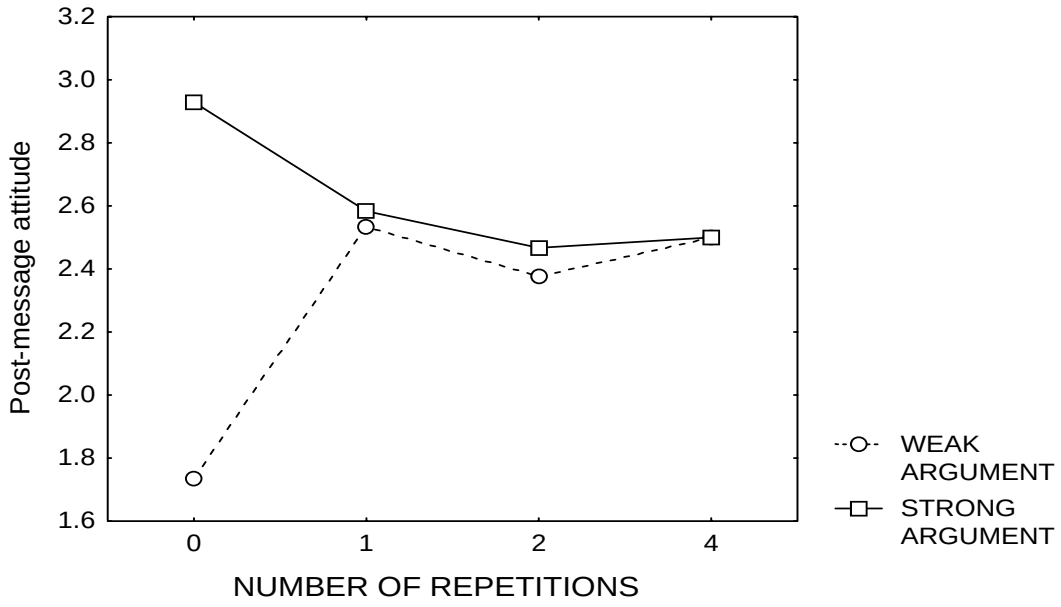

Figure 2. Post-message attitudes towards the priming issue (adjusted for initial attitudes) as a function of message repetition and argument quality, Experiment 2.

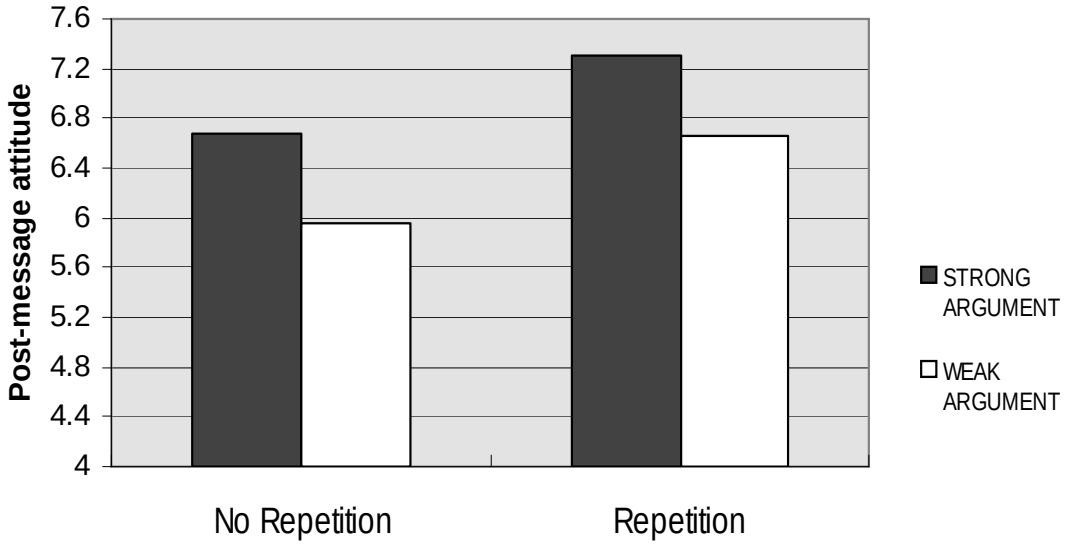

Figure 3. Mood ratings as a function of repetition and order of assessment, Experiment 2.

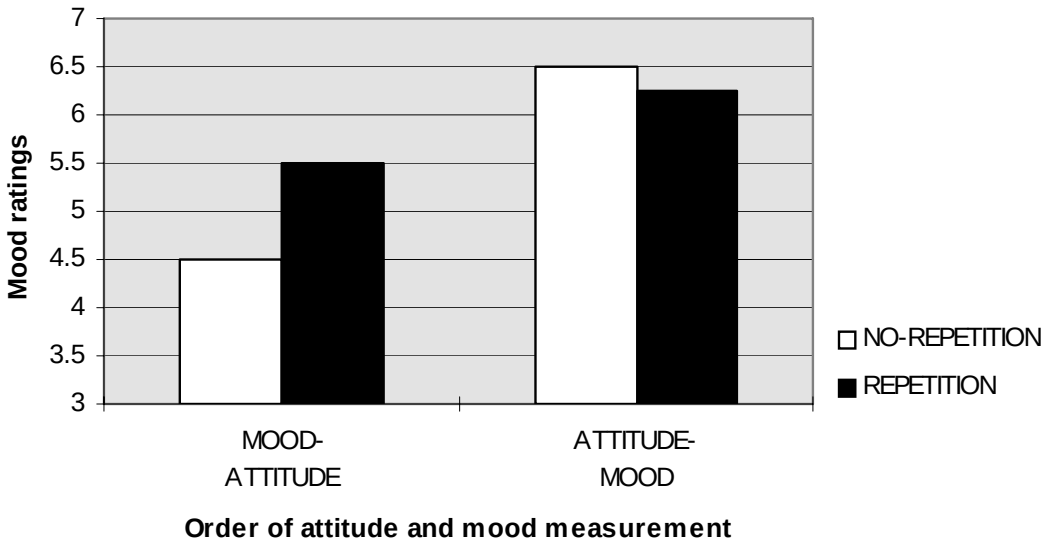

Figure 4: Post-message attitudes towards the target issue (adjusted for initial attitudes) as a function of message repetition and argument quality, Experiment 2.