



## UvA-DARE (Digital Academic Repository)

### Differential processing and attitude change following majority versus minority arguments

de Dreu, C.K.W.; van de Vliert, E.

#### Publication date

1996

#### Published in

British Journal of Social Psychology

[Link to publication](#)

#### Citation for published version (APA):

de Dreu, C. K. W., & van de Vliert, E. (1996). Differential processing and attitude change following majority versus minority arguments. *British Journal of Social Psychology*, 35, 77-90.

#### General rights

It is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), other than for strictly personal, individual use, unless the work is under an open content license (like Creative Commons).

#### Disclaimer/Complaints regulations

If you believe that digital publication of certain material infringes any of your rights or (privacy) interests, please let the Library know, stating your reasons. In case of a legitimate complaint, the Library will make the material inaccessible and/or remove it from the website. Please Ask the Library: <https://uba.uva.nl/en/contact>, or a letter to: Library of the University of Amsterdam, Secretariat, Singel 425, 1012 WP Amsterdam, The Netherlands. You will be contacted as soon as possible.

## Differential processing and attitude change following majority versus minority arguments

Carsten K. W. De Dreu\*

*Department of Psychology, University of Groningen, Grote Kruisstraat 2/1, 9712 TS Groningen, The Netherlands*

Nanne K. De Vries

*University of Amsterdam, The Netherlands*

This experiment tested the general hypothesis that majority influence induces convergent processing, which stimulates attitude change on focal issues, whereas minority influence sometimes produces divergent processing, which might stimulate change on related attitudes. Results of a numerical support (majority vs. minority) by outcome involvement (high vs. low) experiment with attitude change and cognitive activity as dependent variables yielded partial support for these predictions. Majority arguments caused more attitude change on the focal issue than minority arguments, especially under high outcome involvement; no effects, however, were found for attitudes towards related issues. Consistent with expectations also was the result that, especially under high outcome involvement, cognitive activity predicted attitude change on the focal issue in the case of majority support, but generalization to related issues in the case of minority support for persuasive arguments. Results are interpreted as consistent with the general conclusion (a) that majority support is more effective than minority support in eliciting attitude change on focal issues, (b) that both majority and minority support elicit cognitive activity, which predicts attitude change on focal issues in the case of majority support, but generalization in the case of minority support and (c) that these processes are especially strong when there is motivation to engage in systematic processing of persuasive arguments.

For many important issues in today's society, such as abortion, environmental policies, or tax increases, conflicting viewpoints exist. Whereas some viewpoints are supported by the majority, others are clearly minority based. Majority support for discrepant persuasive arguments generally evokes more attitude change on the issue that is directly involved (the focal issue) than minority support (e.g. Deutsch & Gerard, 1955; Mackie, 1987). Cumulating evidence suggests, however, that minority support for discrepant persuasive arguments sometimes elicits attitude change on related issues—topics linked to the focal issue by associated content (Moscovici, 1980; Mugny, 1982; Wood, Lundgren, Ouellette, Busceme & Blackstone, 1994). As to why this occurs, several theoretical perspectives have been proposed. Continuing our previous work (De Dreu & De Vries, 1993), the current

\* Requests for reprints.

research attempts to integrate three theoretical perspectives on majority-minority influence, notably Moscovici's (1980) conversion theory, Mackie's (1987) objective consensus approach and Nemeth's (1986) convergence-divergence perspective.<sup>1</sup>

Moscovici's (1980, 1985) conversion theory asserts that being deviant from a majority is threatening and unpleasant. This induces a social comparison process (i.e. a concern for relationship rather than a concern for the issue at stake) with public compliance and little cognitive elaboration as consequences. Being deviant from a minority is much less threatening, so that the individual will ignore the discrepancy in opinions. If, however, the minority viewpoint is presented so that the recipient cannot ignore it any longer (e.g. following a consistent repetition of the message, a rigid rather than flexible stance), recipients start a 'validation process' in which the minority message is systematically processed and, provided that the minority arguments are of good quality, recipients tend to adopt the minority's point of view. Because identification with a minority is, in general, unpleasant and to be avoided (e.g. Mugny, Kaiser, Papastamou & Pérez, 1984), attitude change is primarily of private and latent nature. Empirical evidence for parts of Moscovici's conversion theory has been provided by Aebischer, Hewstone & Henderson, (1984), Brandstätter *et al.* (1991), Maass & Clark (1983, 1984, 1986), Martin (1988a,b), and Mugny and colleagues (1982); Mugny & Pérez (1991). It should be noted, however, that most of the support for conversion theory pertains to processes underlying minority influence (cf. De Dreu & De Vries, 1993). Regarding the supposed processes of majority influence, evidence is more equivocal.<sup>2</sup>

A contrasting perspective has been forwarded by Mackie (1987); Kruglanski & Mackie (1990). Her objective consensus approach asserts that people expect their attitudes to be shared widely, and that violation of this expectation elicits cognitive activity. A deviant majority violates this expectation to a greater extent than a deviant minority, so that the majority arguments induce more cognitive effort than the minority arguments. Consequently, majority arguments, provided they are correct and valid, produce more public as well as private attitude change on both focal and related issues. In her experiments, Mackie (1987) indeed observed majority arguments to elicit more cognitive effort as exemplified by the generation of more novel arguments and better recall of the source's arguments, as well as more private attitude change on focal and related issues (see also, Baker & Petty, 1994; Latané & Wolf, 1981; Tanford & Penrod, 1984).

The final perspective we would like to consider takes a position more or less intermediate between that of Moscovici (1980) and that of Mackie (1987) and deals with cognitive processes underlying attitude change. In her convergence-divergence perspective, Nemeth (1986) asserts that both majority and minority sources elicit cognitive activity. It is important, however, that she further supposes that majority influence induces convergent thinking: the individual focuses on the issue and views it from the perspective of the majority's judgement. Minority influence, on the other hand, induces divergent processing. Again, the individual actively elaborates upon the issue at stake, but in this case

<sup>1</sup> We do not consider social influence models that do not explicitly consider cognitive processes (e.g. Latané & Wolf, 1981; Tanford & Penrod, 1984) or that proceed from a social decision scheme approach to deal with small group decision making (e.g. Kerr & Wats, 1982; Laughlin, 1988). The main reason for this is that, in general, these models focus on attitude change on the focal issue, and not on related issues, and that these models tend to neglect the nature of cognitive activity.

<sup>2</sup> Evidence obtained in the perceptual domain (i.e. the 'blue-green paradigm'; Moscovici & Personnaz, 1980) is not considered here because many studies failed to replicate this effect (Doms & Van Avermaet, 1980; Martin, 1993; Sorrentino, King & Leo, 1980).

Table 1. Theoretical predictions by three contrasting perspectives on majority vs. minority influence

	Moscovici (1980)		Mackie (1987)		Nemeth (1986)	
	Majority	Minority	Majority	Minority	Majority	Minority
Cognitive activity <sup>a</sup>	0	+	+	0	+	+
Focal change <sup>b</sup>	+	0/-	+	0/-	+	0/-
Generalization <sup>c</sup>	0	+	+	0	xx	xx

<sup>a</sup>Cognitive activity refers to issue-relevant processing (in Nemeth's theory, this is convergent in the case of majority, and divergent in the case of minority support).

<sup>b</sup>Positive signs indicate change towards the source's position. Focal change may be the result of compliance (as in Moscovici's theory) or of issue-relevant processing (as in both other perspectives). Negative shifts are attributed to fear of identification with the source.

<sup>c</sup>xx means that no clear-cut predictions are made.

from multiple perspectives only one of which is suggested by the minority (for empirical evidence, see Legrenzi, Butera, Mugny & Pérez, 1991; Mucchi-Faina, Maass & Volpato, 1991; Nemeth & Kwan, 1985, 1987; Nemeth, Mayselless, Sherman & Brown, 1990; Nemeth, Mosier & Chiles, 1992; Nemeth & Wachtler, 1983).

Table 1 summarizes the three perspectives' propositions regarding cognitive activity, attitude change on focal, and on related issues, as a function of majority versus minority support (for similar reviews, see Chaiken & Stangor, 1986; Maass, West & Cialdini, 1987). Moscovici (1980) posits greater cognitive activity in the minority condition, which then should produce more generalization towards related attitudes, but not more attitude change on the focal issue. Mackie (1987), in contrast, posits greater cognitive activity in the majority condition, which then results in more generalization as well as in more attitude change on the focal issue. And Nemeth (1986) argues for equal amounts of cognitive activity elicited by either a majority or a minority source. However, the cognitive activity is convergent in case of a majority source, and should thus predict attitude change on the focal issue (but less so on related issues). Because cognitive activity is divergent in case of a minority source, no relationship between cognitive activity and attitude change on the focal issue is predicted. At best, related issues may be affected, but it remains difficult to predict exactly when and how.

De Dreu & De Vries (1993) combined Nemeth's theory with qualifications inspired by Mackie's work and research findings by Mugny (Mugny, 1982; Mugny & Pérez, 1991). De Dreu & De Vries argued that a lack of external reasons to engage in systematic processing of the message leads to convergent processing of the majority message because the discrepancy with a majority is motivating in itself, but to heuristic rejection of a minority message. When external reasons motivate to engage in systematic processing, a majority message is processed in a convergent manner, whereas a minority message is processed in a divergent way. Divergent thinking distracts from the focal issue, but it enhances the salience of, and accessibility to, related topics. Table 2 summarizes this differential processing model. In two experiments, De Dreu & De Vries (1993) provided some first support for the contention that, when additional variables motivate subjects to engage in systematic processing, differential processing of the majority or minority argu-

Table 2. Differential processing model of majority vs. minority influence

	Processing motivation <sup>a</sup>			
	Low		High	
	Majority	Minority	Majority	Minority
Cognitive activity <sup>b</sup>	+	0	++	+
Focal change <sup>c</sup>	+	0	++	0/-
Generalization	0/+	0	0	+

<sup>a</sup>This motivation is based on other variables rather than numerical support as such. Examples are argument repetition, induced cognitive conflict, personal relevance, etc.

<sup>b</sup>Cognitive activity refers to issue-relevant processing and is convergent in the case of majority and divergent in the case of minority support.

<sup>c</sup>Positive signs indicate change towards the source's position. The theory assumes that focal change is at least also the result of issue-relevant processing. Negative shifts are attributed to fear of identification with the source.

ments can be observed. In those experiments, subjects were encouraged or not encouraged to scrutinize the source's viewpoint. When encouraged, persuasive majority arguments elicited more convergent processing than persuasive minority arguments, more attitude change on focal issues and less attitude change on related issues. When not encouraged to scrutinize the source's point of view, persuasive majority arguments elicited slightly more convergent processing and more attitude change on focal as well as related issues.

#### The present experiment: Goals and hypotheses

The current experiment continued this prior work. Rather than encouraging recipients to scrutinize the source's point of view, we attempted to motivate them to engage in systematic processing in a less obtrusive way. Following the work of Chaiken (1987) and Petty & Cacioppo (1986, 1990; see also Johnson & Eagly, 1989, 1990), we manipulated the level of outcome involvement in order to obtain the desired differences in motivation to engage in systematic processing. In the high outcome involvement condition, the issue under consideration had personal consequences for the subjects, which was not true in the low outcome involvement condition. Petty & Cacioppo (1986) have repeatedly demonstrated that high outcome involvement motivates subjects to engage in systematic processing more than low outcome involvement (as indicated by post-experimental argument recall, and post-experimental generation of novel arguments).

The second goal of the present experiment was to obtain additional evidence for the contention that attitude change is mediated by the nature of cognitive activity. Although many studies show correlations between thought listing indices such as argument recall and generation of novel argument, on the one hand, and attitude change, on the other (e.g. Baker & Petty, 1994; De Dreu & De Vries, 1993; Mackie, 1987; Trost, Maass & Kenrick, 1992), these indices were always assessed after the attitude post-test. Hence, the possibility that the attitude change caused the observed cognitive activity rather than the reverse cannot be excluded (cf. Bem, 1972; Mackie, 1987). Furthermore, these elaboration measures may evoke cognitive activity by itself, which may obscure the relationship between attitude change and cognitive elaboration.

To avoid these potential problems, we measured reading time as an index of cognitive activity (Campbell & Fairley, 1989; Fazio, 1990; Petty & Cacioppo, 1986; Tesser, Campbell & Mickler, 1983). We expected numerical support to affect the relationship between reading time and attitude change on the focal and related issue. Because majority support is expected to induce convergent processing, reading time should predict attitude change on the focal issue in the case of majority support. But because minority support elicits divergent processing, reading time may predict generalization towards related issues in the case of minority support.

## Method

### Design and subjects

The design was a  $2 \times 2$  factorial, involving numerical support (majority vs. minority) and outcome involvement (high vs. low) as between-subjects variables. Dependent measures were the attitude change on a focal issue between a pre- and post-test, generalization to a related issue and cognitive activity assessed by reading time.

Eighty-six male and female students from a high school in Groningen preparing for university entry in two years time participated in the experiment. Subjects were informed that they would participate in a large-scale survey dealing with all kinds of issues relevant to young people. Subjects were randomly assigned to experimental conditions and received 10 Dutch guilders (about US \$5) for participation.

### Procedure and manipulation of dependent variables

Upon arrival in the laboratory, subjects were seated in front of a computer which displayed all information and questions. Responses had to be communicated via the keyboard. After brief instructions, subjects stated their disagreement or agreement with five statements in favour of introducing entrance exams for university (the focal issue). An example is the statement: 'I think entrance exams increase the quality of university education' (for all items: 1 = completely disagree, to 9 = completely agree). Hereafter, subjects in the high outcome involvement condition were told that, because of the low quality of university education, the Dutch Government was seriously considering introducing entrance exams for Dutch universities within the next two years. Subjects in the low outcome involvement condition received the same information, but with the word 'Dutch' always replaced by the word 'Swedish'.

Subsequently, subjects were told that a large population of Dutch youths had been questioned about their opinions regarding entrance exams (note that we referred subjects to the opinions of Dutch youths, so that this study is limited to influence by an in-group source only; see David & Turner, this issue). In the majority condition, we told the subjects that a large majority of 82 per cent favoured entrance exams. In the minority condition, we told the subjects that only a small minority of 18 per cent favoured entrance exams. Subjects then were shown four arguments strongly favouring entrance exams, supposedly the ones that were most frequently forwarded by the majority (or minority) of these previously questioned subjects. An example of such an argument is: 'Admission exams should be introduced because they provide a better test of the specific skills and abilities needed for higher education than school exams' (for pre-test results, see De Dreu & De Vries, 1993).

When subjects pressed a key indicating that they had read the arguments (the computer registered the response latency), they responded to the five attitude statements concerning the focal issue once again, gave their disagreement or agreement with seven statements regarding a related issue (the usefulness of exams and tests in school, e.g. 'I think school exams are reliable indicators of success in school'; always 1 = completely disagree to 9 = completely agree). Subjects then responded to several manipulation checks, were debriefed and dismissed.

## Results

### Manipulation checks

*Involvement.* We asked subjects how involved they were, and how important they found

the attitude topic (both 1 = not at all to 6 = very much). Analysis of variance on the combined ratings ( $r(86) = .56, p < .001$ ) yielded the expected main effect for involvement showing that subjects reported higher involvement in the high rather than low involvement condition ( $M = 3.36$  vs.  $M = 2.86; F(1,82) = 5.93, p < .025$ ). No other effects were significant.

Although the manipulation of outcome involvement appears successful in that different levels of involvement were indeed created, it should be noted that in neither condition was the amount of reported outcome involvement very high. One reason for this may be that subjects were high school students expecting university entrance only in two years time, so that the issue of university entrance exams was not yet very compelling to them. The implication is, however, that our data pertain to a situation of 'no' versus 'some' motivation to engage in systematic processing, rather than to the intended 'low' versus 'high' motivation to systematic processing. We will deal with this issue in more detail in the Conclusions and Discussion section.

**Numerical support.** To check the adequacy of the numerical support manipulation, we asked what percentage of Dutch students would favour the introduction of entrance exams. As expected, subjects in the majority condition reported a higher percentage than those in the minority condition ( $M = 66.4$  per cent vs.  $M = 37.1$  per cent;  $F(1,82) = 44.04, p < .001$ ). Interestingly, however, there is some drift down in the majority condition (from 82 per cent down to 66.4 per cent) and a drift up in the minority condition (from 18 per cent up to 37.1 per cent). A similar pattern can be observed in other studies as well (e.g. De Dreu & De Vries, 1993). Although we do not have a viable explanation for this tendency, the mere implication is that the tests of our hypotheses regarding effects of numerical support became more conservative than intended. In addition, we repeated the analyses reported below with 'perceived numerical support' as a continuous variable (rather than the manipulated categorical variable) and these analyses yielded results highly comparable with those reported below.

#### Attitude change and generalization to related issues

**Focal issue.** Responses to the five statements regarding the focal issue were summed into one pre-test index (Cronbach's  $\alpha = .78$ ) and one post-test index (Cronbach's  $\alpha = .86$ ). As in our prior research (De Dreu & De Vries, 1993), pre-test attitudes were centred around the mid-point of the scale ( $M = 5.37, SD = 1.55, Mdn = 5.50$ ), and differences in pre-test attitudes did not interact with any of the independent variables. Analysis of covariance on the post-test index, with the pre-test as a covariate was used to test the hypothesis that majority support produces more attitude change on the focal issue, but especially under high outcome involvement. The slope of the regression lines did not vary over experimental conditions ( $F(3,82) = 2.55, p > .10$ ) and post-test attitude regression significantly on the pre-test ( $\beta = .87, p < .001$ ). The analysis further revealed a main effect for numerical support ( $F(1,81) = 9.95, p < .005$ ), which was qualified by the predicted interaction with involvement ( $F(1,81) = 4.98, p < .05$ ). As expected, majority support produced more change than minority support, especially under high rather than low involvement (see row 2 of Table 3).

Table 3. Effects of numerical support and outcome involvement on attitudes

	Outcome involvement			
	High		Low	
	Majority	Minority	Majority	Minority
1. N	21	21	21	23
2. Focal issue	6.18 <sub>a</sub>	5.19 <sub>b</sub>	5.81 <sub>a</sub>	5.63 <sub>ab</sub>
SD	(1.52)	(1.93)	(1.15)	(1.92)
3. Gain scores	0.77 <sub>a</sub>	-0.16 <sub>b</sub>	0.43 <sub>a</sub>	0.28 <sub>ab</sub>
SD	(0.76)	(0.72)	(0.71)	(1.05)
4. Related issue	4.88	3.95	4.31	4.57
SD	(1.78)	(1.38)	(1.10)	(1.39)

Note. Entries in rows 2 and 4 are adjusted means. SDs (standard deviations) are based on observed means. Italic gain scores in row 3 differ from zero at  $p < .05$ . Means not sharing equal subscripts per row differ from each other at  $p < .05$ .

To trace the direction of the change, we performed a gain score analysis (post-test minus pre-test). Although gain scores are generally unreliable (Stevens, 1992), the correlations between pre-test and post-test ( $r = .68$ ), as well as average test reliability ( $\alpha = .89$ ) together yield a gain score reliability of .67, which is acceptable (cf. Thorndike & Hagen, 1977). Consistent with this, analysis of variance on the gain scores yielded effects virtually identical to those for adjusted means reported above. As can be seen in Table 3, significant change occurred only under high involvement—majority support. Receiving minority arguments under high involvement induced a slightly negative shift.

**Generalization to related issues.** The seven related attitude items were summed (Cronbach's  $\alpha = .76$ ) and submitted to an analysis of covariance with the pre-test attitude as the covariate. The slope of the regression lines again does not vary as a function of experimental conditions ( $F(3,82) = 2.65, p > .10$ ) and the average attitude on related topics regressed significantly on the pre-test attitude ( $\beta = .44, p < .001$ ). The predicted interaction between numerical support and involvement did not emerge ( $F(1,81) = 2.34, p > .10$ ). In fact, the means tended to go in the same direction as those for the focal issue (see Table 3).

#### Cognitive activity

To assess cognitive activity, we registered the time subjects spent reading the arguments. As pointed out, the advantage of using response latencies to trace cognitive activity is that they are unobtrusive so that they do not affect cognitive activity by itself (as more popular measures such as argument recall and argument generation do). Moreover, since response latency precedes the attitude post-test, a better indication of a causal relationship is obtained. The obvious disadvantage of using response latencies is, of course, that we can never be sure what exactly happens during the time subjects read. That is, we need to make inferences, rather than proceed on the basis of observations. We believe, however, that prior research yields a solid basis for making such inferences.

Table 4. Reading time and within-cell correlations between cognitive activity (CA) and attitude change on the focal issue (FI) and attitudes towards related issues (RI)

	Outcome involvement			
	High		Low	
	Majority	Minority	Majority	Minority
1. N	20	21	21	23
2. CA	25.31	24.54	21.38	28.15
SD	(20.40)	(17.14)	(12.51)	(15.19)
3. CA with FI	+0.47**	+0.23	+0.39*	+0.11
4. CA with RI	-0.21	+0.68**	-0.12	+0.15

\* $p < .10$ . \*\* $p < .01$ .

Note. Cognitive activity is measured in seconds.

The average reading time was 25.02 s, and did not vary as a function of the independent variables ( $F_s < 2.20$ ,  $p_s > .15$ ; see also Table 4).<sup>3</sup> This is consistent with Nemeth's (1986) position that numerical support has no influence on the amount of cognitive activity, as well as with Campbell & Fairey's (1989) failure to find effects of numerical support on attention to the stimulus. At first sight, however, this result may seem in contradiction with Petty & Cacioppo's (1986) argument that high outcome involvement causes better elaboration of the message than low outcome involvement. It should be noted, however, that their argument pertains to issue-relevant thought, whereas our measure of cognitive activity cannot distinguish between issue-relevant and irrelevant thoughts.

Circumstantial evidence for Petty & Cacioppo's line of reasoning was found, however, when we considered the correlations between attitudes and cognitive activity. To test the basic proposition that, especially under high involvement, cognitive activity predicts attitude change on the focal issue in the case of majority support but generalization in the case of minority support, we analysed within-condition correlations between attitude change on the focal issue and reading time and between attitudes towards the related issue and reading time (note that a more sophisticated mediated regression analysis as suggested by Baron & Kenny, 1986, fails to take into account the different nature of cognitive activity we may infer from particular data patterns).

The within-cell correlations are reported in Table 4. As can be seen, there is good support for our line of thought. First, in the case of majority support, cognitive activity predicts attitude change on the focal issue but is significant especially in the high outcome involvement condition. Furthermore, there were no significant correlations between cognitive activity and attitudes towards the related issue. Second, in the case of minority support, there were no significant correlations between cognitive activity and attitude change on the focal issue. Cognitive activity does predict, however, attitudes on related issues, but again this correlation was significant only in the high outcome involvement condition.

<sup>3</sup> The distribution of the response latency data was somewhat skewed. As suggested by Fazio (1990), we performed a logarithmic transformation. Analyses using these transformed scores yielded identical effects as those based on the raw scores that are reported here. In addition, there was one subject who used a reading time four times as long as the second longest reading time. Although this did not change the results in any systematic way, this obvious outlier was excluded from all analysis involving reading time.

### Conclusions and discussion

This research tested parts of an integration of the theoretical propositions forwarded by Nemeth (1986), Mackie (1987) and Moscovici (1980, 1985). This integration led to the differential processing model which argues that—provided there is sufficient cognitive ability to process persuasive messages—discrepant majority arguments will be processed in a systematic though convergent way. This produces attitude change on the focal issue, and some generalization to related issues. Minority arguments will be rejected on the heuristic basis and processed only when there are external reasons to engage in systematic processing. Systematic processing of the minority message will be, however, divergent in nature, which distracts from the focal issue, and which should enhance accessibility to related topics.

Previous research (De Dreu & De Vries, 1993) provided initial support for this differential processing model. It showed how encouraging recipients to engage in systematic processing enhanced the elaboration of minority (but not majority) arguments. The present experiment adds to this previous work by testing the same hypotheses, this time, however, not by encouraging recipients to engage in systematic processing (which essentially results in extrinsic motivation), but by providing a context in which they should become intrinsically motivated to process systematically a persuasive message. Since the integrative framework does not distinguish between extrinsic and intrinsic motivation, we predicted similar effects, and thus expected a cross-validation of the proposed integration. Specifically, we tested the proposition that when recipients are motivated to engage in systematic information processing, majority support compared to minority support produces more convergent processing with concomitant attitude change on the focal issue, whereas minority support induces more divergent processing with its concomitant generalization to related issues. Thus, the amount of cognitive activity was not expected to be influenced by numerical support. Rather, cognitive activity was predicted to relate to different kinds of attitude change: attitude change on focal issues in the case of majority support, and on related issues in the case of minority support.

The results are consistent with the contention that majority and minority support elicit information processing activity that is different in terms of nature and focus rather than quantity. Furthermore, our data showed that these differences in information processing become especially apparent under conditions that foster systematic processing of persuasive arguments such as outcome involvement. Hence, there is now cumulative evidence that convergent-divergent thinking precedes and causes attitude change on focal and related issues in the case of majority or minority support (De Dreu & De Vries, 1993; Mackie, 1987; Trost *et al.*, 1992). Our specific contribution to this general conclusion is (a) that especially under high motivation to engage in systematic processing, numerical support affects the nature and focus of cognitive activity and (b) we observed the relationship between processing and attitude change using an unobtrusive measure.

We obtained further support for the contention that under high outcome involvement, majority support produces more attitude change on the focal issue than minority support. This finding corroborates prior research by Mackie (1987), De Dreu & De Vries (1993) and Baker & Petty (1994) that majority support produces more focal change, and that this focal change appears related to the amount (and nature, see above) of the recipient's cognitive activity. An interesting and important question awaiting future research is to what extent majority induced attitude change on the focal issue is purely the result of system-

atic processing of the source's arguments. That is, we cannot yet exclude the alternative hypothesis based on Moscovici (1980) that majority induced change on focal issues is not also the result of compliance and reliance on a consensus-implied correctness heuristic (cf. Axson, Yates & Chaiken, 1986).

In light of the above, it is interesting to note that an experiment by Trost *et al.* (1992) using a similar design as ours seems to obtain different results. Trost *et al.* provided subjects with a statement about entrance exams supposedly forwarded by a fellow student, and previously discussed in an 11-person group. During discussion, the majority of nine members favoured the introduction of entrance exams, or opposed it (the minority of two members either opposed or favoured the proposal). Subjects were given four strong and one weak argument favouring entrance exams (thus either with majority or with minority support) and were told that the entrance exams would be introduced soon (high outcome involvement), or only after nine years (low outcome involvement condition). Results showed that (a) majority arguments tended to induce more favourable attitudes irrespective of outcome involvement and (b) minority arguments produced no change in the high outcome involvement condition, but strong positive change in the low outcome involvement condition. These results are consistent with our data as far as majority influence is concerned (i.e. as Table 3 shows, outcome involvement has less of an impact in the majority as compared to the minority condition). However, our data deviate from those obtained by Trost *et al.* regarding minority influence in the low outcome involvement condition (where they observed much more change than we did), perhaps because their result is due to the different manipulations of numerical support. In the Trost *et al.* study, subjects were led to believe that the minority was actually discussing the topic with the majority and stuck to its position, thus resisting considerable social pressure. In our study subjects learned that only 18 per cent of the students previously questioned supported the arguments. The mere fact that the minority actually resisted social pressures from the majority may be a crucial difference between the Trost *et al.* (1992) and the current experiment, which may explain the differences in data patterns.

The above discussion points to some interesting differences in the methodologies used to study effects of numerical support on cognitive activity and attitude change. The current experiment, as well as previous studies by Mackie (1987) and De Dreu & De Vries (1993), manipulated numerical support in pure isolation from any other source characteristic. Trost *et al.* (1992), as well as older research by Maass and colleagues (for a review, see Maass *et al.*, 1987), provide a richer context in which subjects observe a majority discussing the topic with a minority group sticking to its opinion. Still other studies tend to provide subjects with statements forwarded by a minority group of activists (e.g. Mugny, 1982; Mugny & Pérez, 1991). These variations in research paradigms may to a certain extent account for the different results sometimes obtained. One important difference appears to be, for example, the presentation of the minority as a cohesive group. Indeed, as noted by Chaiken & Stangor (1986, p. 614) '... the investigation of real groups with real histories and futures interacting over a length of time may be required to fully understand the complexities of both social control and innovation... Although central to Moscovici's initial theorizing, few investigators have studied the impact of social (vs. numerical) minorities on innovation'. The present research clearly subscribes to the latter line of research (i.e. on numerical support), whereas the study by Trost *et al.* (1992) tends to be part of the first line of research (i.e. dealing with 'social' minorities).

Although we tend to agree with the urge for more research comparing influence processes set forth by numerical vs. social majorities and minorities, we wish to emphasize that the study of numerical support in isolation is valuable as well. At the theoretical level, it informs us about the role of consensus information in forming and altering opinions. At a more applied level, formulations about the influence of numerical support may be used in marketing and sales campaigns, or in public education programmes. Our research suggests, for example, that if one wishes to induce considerable attitude change on a specific topic, informing the public that only a minority supports this point of view may prove highly ineffective. If, however, the goal is to stimulate divergent thinking about the topic, then such information may prove highly effective.

Although our data confirmed hypotheses regarding cognitive activity and attitude change on the focal issue, they were inconsistent with the proposition that, under high outcome involvement, minority support would elicit more generalization towards related issues. This failure might be due to the fact that the related issue considered here was closely associated with the focal issue (i.e. on the post-test, focal and related issues correlated  $r = .50, p < .001$ ). Consequently, processes affecting attitude change on the focal issue may have suppressed the processes expected to affect generalization. Hence, future research might consider several related issues, varying in their degree of correspondence with the focal issue. If our reasoning is correct, minority support with its concomitant divergent processing would affect related issues low in correspondence more than those high in correspondence with the focal theme. Circumstantial evidence derives from a comparison between the current study and that by De Dreu & De Vries (1993). In that study, the prediction regarding generalization was supported with a related issue only weakly associated with the focal one ( $r = .20$ , as compared to the  $r = .50$  in the current experiment).<sup>4</sup>

Another explanation for our failure to support the predictions regarding generalization may be related to the previously mentioned fact that our manipulation of outcome involvement may have resulted in contrasting 'no vs. some' motivation to process systematically, rather than in the intended 'low vs. high' motivation. As we have pointed out elsewhere (De Dreu & De Vries, 1993, 1995), minority arguments may elicit related change only when recipients are forced to engage in systematic processing. That is, there needs to be a considerable amount of, and not just some, motivation to process systematically the minority's point of view, for this to result in attitude change on related issues. If true, future research may attempt to induce high, rather than some, outcome involvement and then should observe minority arguments to induce change on related issues. For the moment then, we may conclude that our data are very much consistent with Nemeth's (1986) convergence-divergence perspective. That is, Nemeth (1986) would predict a relation of the kind 'majority influence—convergent thinking—focal attitude change' since the convergent thinking implies that the issue is considered from the majority's point of view (cf. Mackie, 1987), but not a relation of the kind 'minority influence—divergent thinking—related attitude change' since divergent thinking means that the issue is con-

<sup>4</sup> It should be noted that in most other research distinguishing between focal and related attitude topics, pre-test correlations between .30 and .50 are more common than between .10 and .30. Seen this way, the current study does not really deviate from other studies in this area. Future research might, however, not only assess pre-test correlations but also independent assessments of the extent to which focal and related issues are seen as 'directly' vs. 'indirectly' related (cf. Mackie, 1987).

sidered from multiple perspectives, not necessarily the one forwarded by the minority. In a sense, this is consistent with De Dreu & De Vries (1993), who only found a 'minority influence-divergent thinking-related attitude change' link when the minority presented weak arguments (rather than strong ones, as in the present study). Perhaps only when the minority source presents weak arguments does divergent thinking focus more on the perspective forwarded by the minority (in order to understand why such weak arguments were given). This in turn might enhance generalization to related issues (cf. De Dreu & De Vries, 1993; Mugny & Pérez, 1991).

To sum up, the current experiment has several strengths and several weaknesses. Among the weaknesses is that our manipulation of outcome involvement may have created a situation of 'no' vs. 'some', rather than 'low' vs. 'high' motivation to engage in systematic processing. In addition, our conclusions are limited because the current findings were largely based on inferences rather than on direct observations. At the same time, of course, these inferences imply that we were able to confirm processes demonstrated elsewhere with an unobtrusive method. Thus, the present experiment's contribution is twofold. First, we found general support for the contention that majority support compared to minority support produces more attitude change on focal but not on related issues, especially under conditions that increase the motivation to engage in systematic processing of the persuasive arguments. We further obtained evidence for the idea that these effects are due to cognitive activity that is focused on either the focal issue (convergent processing), or on related issues and underlying organizing principles.

#### Acknowledgements

This research was financially supported by a Royal Netherlands Academy of Sciences Fellowship awarded to Carsten de Dreu, and Grant 560-270-041 of the Netherlands Science Foundation (NWO) awarded to Nanne de Vries. We wish to thank Charlan Nemeth and three anonymous reviewers for their very helpful and constructive comments on a previous version of this article.

#### References

- Aebischer, V., Hewstone, M., & Henderson, M. (1984). Minority influence and musical preference: Innovation by conversion, not coercion. *European Journal of Social Psychology*, 14, 23-33.
- Axson, D., Yates, S., & Chaiken, S. (1986). Audience response as a heuristic cue in persuasion. *Journal of Personality and Social Psychology*, 53, 30-40.
- Baker, S. M., & Petty, R. E. (1994). Majority and minority influence: Source-position imbalance as a determinant of message scrutiny. *Journal of Personality and Social Psychology*, 67, 5-19.
- Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 67, 5-19.
- Bern, D. J. (1972). Self-perception theory. In L. Berkowitz (Ed.), *Advances in Experimental Social Psychology*, vol. 6, pp. 1-62. New York: Academic Press.
- Brandstätter, V., Ellemers, N., Gavruta, F., Giostue, F., Huguet, P., Kroon, M., Morchain, P., Pujal, M., Rubini, M., Mugny, G., & Pérez, J. A. (1991). Indirect majority and minority influence: An exploratory study. *European Journal of Social Psychology*, 21, 199-212.
- Campbell, J. D., & Fairley, P. J. (1989). Informational and normative routes to conformity: The effect of faction size as a function of norm extremity and attention to the stimulus. *Journal of Personality and Social Psychology*, 57, 457-468.
- Chaiken, S. (1987). The heuristic model of persuasion. In M. Zanna, J. M. Olson & C. P. Herman (Eds.), *Social Influence: The Ontario Symposium* 5. Hillsdale, NJ: Erlbaum.
- Chaiken, S., & Stangor, C. (1986). Attitudes and attitude change. *Annual Review of Psychology*, 38, 575-650.

- De Dreu, C. K. W., & De Vries, N. K. (1993). Numerical support, information processing and attitude change. *European Journal of Social Psychology*, 23, 647-662.
- De Dreu, C. K. W., & De Vries, N. K. (1995). Un modèle du traitement différentiel dans l'influence majoritaire et minoritaire. In J.-L. Beauvois, R. V. Joule & J.-M. Monteil, (Eds), *Perspective Cognitives et Conduites Sociales*, vol. 5. Neuchâtel-Paris: Delachaux & Niestlé.
- Deursch, M., & Gerard, H. B. (1955). A study of normative and informational social influences upon individual judgment. *Journal of Abnormal and Social Psychology*, 51, 629-636.
- Doms, M., & Van Avermaet, E. (1980). Majority influence, minority influence and conversion behavior. *Journal of Experimental Social Psychology*, 12, 283-292.
- Fazio, R. H. (1990). A practical guide to the use of response latency in social psychological research. In C. Hendrick & M. S. Clark (Eds), *Research Methods in Personality and Social Psychology*, vol. 11, pp. 74-97. London: Sage.
- Johnson, B. T., & Eagly, A. H. (1989). Effects of involvement on persuasion: A meta-analysis. *Psychological Bulletin*, 106, 290-314.
- Johnson, B. T., & Eagly, A. H. (1990). Involvement and persuasion: Types, traditions, and the evidence. *Psychological Bulletin*, 107, 375-384.
- Kerr, N. L., & Watts, B. L. (1982). After division, before decision: Group faction size and predecisional thinking. *Social Psychology Quarterly*, 45, 198-205.
- Kruglanski, A., & Mackie, D. M. (1990). Majority and minority influence: A judgmental approach. In W. Stroebe & M. Hewstone (Eds), *European Review of Social Psychology*, vol. 1, Chichester: Wiley.
- Latané, B., & Wolf, S. (1981). The social impact of majorities and minorities. *Psychological Review*, 88, 438-453.
- Laughlin, P. R. (1988). Collective induction: Group performance, social combination processes and mutual majority and minority influence. *Journal of Personality and Social Psychology*, 54, 254-267.
- Legrenzi, P., Butera, F., Mugny, G., & Pérez, J. A. (1991). Majority and minority influence in inductive reasoning: A preliminary study. *European Journal of Social Psychology*, 21, 359-364.
- Levine, J. M., & Russo, E. M. (1987). Majority and minority influence. In C. Hendrick (Ed.), *Review of Personality and Social Psychology*, vol. 8. Newbury Park, CA: Sage.
- Maass, A., & Clark, R. D. III (1983). Internalization versus compliance: Differential processes underlying minority influence and conformity. *European Journal of Social Psychology*, 13, 197-215.
- Maass, A., & Clark, R. D. III. (1984). Hidden impact of minorities: Fifteen years of minority influence research. *Psychological Bulletin*, 95, 428-450.
- Maass, A., & Clark, R. D., III (1986). Conversion theory and simultaneous majority/minority influence: Can reactance offer an alternative explanation? *European Journal of Social Psychology*, 16, 305-309.
- Maass, A., West, S., & Cialdini, R. B. (1987). Minority influence and conversion. In C. Hendrick (Ed.), *Review of Personality and Social Psychology*, vol. 8. Newbury Park, CA: Sage.
- Mackie, D. M. (1987). Systematic and nonsystematic processing of majority and minority persuasive communications. *Journal of Personality and Social Psychology*, 53, 41-52.
- Martin, R. (1988a). Ingroup and outgroup minorities: Differential impact upon public and private responses. *European Journal of Social Psychology*, 18, 39-52.
- Martin, R. (1988b). Minority influence and social categorization: A replication. *European Journal of Social Psychology*, 18, 369-373.
- Martin, R. (1993). Majority and minority influence using the afterimage paradigm: Three replications. Paper presented at the Xth General Meeting of the European Association of Experimental Social Psychology, Lisbon, September 15-19.
- Moscovici, S. (1980). Toward a theory of conversion behavior. In L. Berkowitz (Ed.), *Advances in Experimental Social Psychology*, vol. 13, pp. 209-239. New York: Academic Press.
- Moscovici, S. (1985). Social influence and conformity. In G. Lindzey & E. Aronson (Eds), *The Handbook of Social Psychology*, 3rd ed., pp. 347-412. New York: Random House.
- Moscovici, S., & Perrenass, B. (1980). Studies in social influence V: Minority influence and conversion behavior in a perceptual task. *Journal of Experimental Social Psychology*, 10, 270-282.
- Murci-Fauna, A., Maass, A., & Volpato, C. (1991). Social influence: The role of originality. *European Journal of Social Psychology*, 21, 183-198.
- Mugny, G. (1982). *The Power of Minorities*. Cambridge: Cambridge University Press.
- Mugny, G., Kaiser, C., Papastamou, S., & Pérez, J. A. (1984). Intergroup relations, identification and social influence. *British Journal of Social Psychology*, 23, 317-322.



- Mugny, G. & Pérez, J. A. (1991). *The Social Psychology of Minority Influence*. Cambridge: Cambridge University Press.
- Nemeth, C. J. (1986). Differential contributions of majority and minority influence processes. *Psychological Review*, 93, 10–20.
- Nemeth, C. J. & Kwan, J. (1985). Originality of word associations as a function of majority versus minority influence. *Social Psychology Quarterly*, 48, 277–282.
- Nemeth, C. J. & Kwan, J. (1987). Minority influence, divergent thinking and detection of correct solutions. *Journal of Applied Social Psychology*, 17, 786–797.
- Nemeth, C., Maysseless, O., Sherman, J. & Brown, Y. (1990). Exposure to dissent and recall of information. *Journal of Personality and Social Psychology*, 58, 429–437.
- Nemeth, C., Mosier, K. & Chiles, C. (1992). When convergent thought improves performance: Majority versus minority influence. *Personality and Social Psychological Bulletin*, 18, 139–144.
- Nemeth, C. & Wachtler, J. (1983). Creative problem solving as a result of majority vs. minority influence. *European Journal of Social Psychology*, 13, 45–55.
- Petty, R. E. & Cacioppo, J. T. (1986). The elaboration likelihood model of persuasion. *Advances in Experimental Social Psychology*, 19, 123–205.
- Petty, R. E. & Cacioppo, J. T. (1990). Involvement and persuasion: Tradition versus integration. *Psychological Bulletin*, 107, 367–374.
- Sortentino, R. M., King, G. & Leo, G. (1980). The influence of the minority on perception: A note on a possible alternative explanation. *Journal of Experimental Social Psychology*, 16, 293–301.
- Stevens, J. (1992). *Applied Multivariate Statistics for the Social Sciences*, 2nd ed. Hillsdale, NJ: Erlbaum.
- Tanford, S. & Penrod, S. (1984). Social influence model: A formal integration of research on majority and minority influence processes. *Psychological Bulletin*, 95, 189–225.
- Tesser, A., Campbell, J. D. & Mickler, S. (1983). The role of social pressure, attention to the stimulus, and self-doubt in conformity. *European Journal of Social Psychology*, 13, 217–233.
- Thorndike, R. & Hagen, E. (1977). *Measurement and Evaluation in Psychology and Education*. New York: Wiley.
- Trost, M. R., Maass, A. & Kenrick, D. T. (1992). Minority influence: Personal relevance biases cognitive processes and reverses private acceptance. *Journal of Experimental Social Psychology*, 28, 234–254.
- Wood, W., Lundgren, S., Ouellette, J. A., Busserne, S. & Blackstone, T. (1994). Minority influence: A meta-analytical review of social influence processes. *Psychology Bulletin*, 115, 323–345.

Made available electronically January 1996