

**"THE INDIRECT EFFECTS OF NEGATIVE
INFORMATION ON ATTITUDE CHANGE"**

by

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Drawing on previous research suggesting that negative and positive information are subject to differing levels of processing intensity, an argument is built that non-targeted changes in product attribute beliefs will differ as a function of message valence. Results of an experiment indicate that recipients of negative product claims tend to update non-targeted beliefs on the basis of claim inconsistency with prior beliefs and perceived attribute correlations. Positive message recipients are less sensitive to claim inconsistency and tend to update all non-targeted beliefs by a similar amount, regardless of attribute correlations. In contrast to other studies of negative information, the importance weights assigned to target attributes are not found to vary greatly as a function of message valence. Finally, the indirect effects of negative information are found to mediate the relationship between direct message effects and attitude change. Mediation is not significant when message valence is positive.

Consumer research has been surprisingly consistent in demonstrating that negative information has a stronger effect than positive information on many decision outcomes (e.g., Arndt 1968; Lutz 1975a; Mizerski 1982; Weinberger 1986; Weinberger and Dillon 1980). A commonly cited explanation for this so-called "negativity effect" is that negative information is weighted more heavily than positive information during decision deliberations (Kanouse 1984). Empirical evidence of differential weighting is largely found in social psychology research where subjects are instructed to form global impressions of hypothetical persons described by lists of personality traits (e.g., Anderson 1965). As negative items within such lists tend to have a stronger effect on overall impressions than would be predicted from their individual scale ratings, researchers have concluded that the negative items are overweighted at the point of information integration.

Although the differential weighting hypothesis has received widespread acceptance among researchers of negativity effects, it is important to recognize that the argument is most compelling for judgment tasks of the type in which the phenomenon was first observed. If a previously unknown person or brand is described by both a negative and a positive claim, it would be reasonable for the message recipient to "play it safe" by rejecting the positive claim and consequently overweighting the negative one. In contrast, when negative information conflicts with prior beliefs about a brand, it is not possible for the individual to simply reject those prior beliefs. In order to integrate the new information with the old, the individual may feel compelled to reduce their perceived inconsistency. Given high credibility of the negative claim, an effective strategy for this purpose would be to update the prior beliefs to a level more consistent with the new product claim. An alternative explanation of the negativity effect in the presence of prior product

knowledge thus might be that negative and positive information lead to differential updating processes with respect to prior beliefs. This may hold true for both targeted and non-targeted beliefs.

Empirical evidence of a negativity bias in the belief updating process is cited by Lutz (1975a) who found that non-targeted, or "second-order", changes in subjects' brand-related cognitive structures were greater in response to negative as opposed to positive stimulus messages. Negativity effects were not the focus of Lutz's research, however, and his results do not allow for a thorough investigation of this phenomenon. One question in particular that was not addressed by Lutz's research is whether attitude change resulted from changes in beliefs, changes in importances, or both. A second unanswered question is how message inconsistency combines with message valence to determine belief updating effects. As the preceding paragraph suggests that inconsistency underlies the negativity effect, it can be argued that positive information, if sufficiently inconsistent with prior beliefs, would give rise to the same type of effects.

In this research we examine the effects of information valence on attitude change and, in doing so, control for the confounding effects of claim inconsistency. Unlike impression formation studies which tend to infer a weight adjustment process from measures of overall evaluations (Anderson 1965; Fiske 1980; Richey, McClelland and Shimkunas 1967), we measure changes in product attribute beliefs and in the importance weights assigned to those beliefs. In addition, we test to see if observed changes in non-targeted attribute beliefs and importances mediate the relationship between targeted attribute effects and attitude change. Due to potential differences in the processing of negative and positive product claims, there is reason to expect stronger mediation when messages are negatively valenced.

The importance of distinguishing between the weighting and updating arguments can be seen if one considers the task of designing communication strategies to limit the adverse effects of a negative product claim. If the effects of the negative message are limited to the product feature that was explicitly targeted in the claim, remedial action might concentrate on reducing the perceived importance of that attribute to the consumer. On the other hand, if the effects of the negative message tend to spread to other product beliefs, this type of response would be less effective. Instead, attention would have to focus on restoring the network of product beliefs to a previous, more favorable, level. Although the current research does not explicitly consider the question of optimal response to negative product claims, it does offer insight for future work with that objective in mind. This topic is discussed further at the paper's conclusion.

BACKGROUND

Weighting versus Belief Change

Although explanations for the negativity effect are varied, many take as given that negative information is assigned greater weight than positive information when individuals integrate various information bits to form an overall opinion or judgment. The argument stems largely from Anderson's (1965) finding that subjects formed more extreme impressions of hypothetical persons described by pairs of *unfavorable* and neutral personality traits than of those described by pairs of *favorable* and neutral personality traits. As stimulus traits had been pre-calibrated to be equally polarized from the neutral point of an evaluative scale, Anderson concluded that such a result would follow only if the negative traits had been weighted more heavily than the positive ones when all information was integrated to

form global impressions. Replications of this basic finding (e.g., Hamilton and Zanna 1972; Richey, McClelland and Shimkunas 1967), have led to widespread acceptance of the differential weighting hypothesis (Kanouse 1984; Kanouse and Hanson 1972).

Despite the logical appeal of this hypothesis it is important to recognize that it follows critically from Anderson's assumption that the scale values (i.e., ratings) of his stimulus traits did not vary from their predetermined levels during information integration. Differential valuation of the neutral traits when paired with negative and positive stimuli would present a confound for the differential weighting hypothesis¹. The constant valuation assumption seems particularly tenuous when considering the process of attitude change. Unlike the attitude formation situation, attitude change entails a reconciliation of new information with prior brand knowledge and beliefs. Perceived inconsistency of the new information with prior beliefs creates an integration dilemma for the message recipient. Two ways of resolving the dilemma are rejecting the new information and updating the prior beliefs. Although the new claim will be rejected in some situations, under conditions of claim credibility and believability, updating is a likely result.

Valence versus Consistency

The preceding paragraph suggests that any claim, regardless of valence, can create pressure for second-order belief change when inconsistency with prior beliefs is high. Indeed, previous research has demonstrated that positive information, if sufficiently unexpected, can have a strong effect on overall evaluations (Feldman 1966; Fiske 1980). Importantly, however, these studies also have shown that negativity effects persist when the effects of unexpectedness have been separated

from those of valence. If the effects of message inconsistency match those of unexpectedness, we thus would expect to observe negativity effects in attitude change and belief change which are distinct from the effects of inconsistency.

Recent work in social psychology suggests a source for such negativity effects. Taylor (1991), in a recent review, argues that negative information evokes more cognitive processing activity than does either positive or neutral information. Evidence for this claim is cited by Fiske (1980), who found that subjects took longer to process negative, as opposed to positive, information before responding to questions about global evaluations, and by mood researchers who show that negative moods lead individuals to process information more systematically and thoroughly than they would under positive mood conditions (see Taylor 1991 for an overview).

A reasonable outcome of heavy claim processing would be heightened awareness of claim inconsistency with prior beliefs. As a result of this increased awareness we would expect an increase in the effect of the message on the explicitly targeted belief (Aronson, Turner, and Carlsmith 1963), as well as an increase in the pressure for second-order change in non-targeted beliefs. Thus, although perceptions of claim inconsistency may determine the magnitude of both targeted and non-targeted belief change, message valence may determine the level of perceived inconsistency.

In attempting to predict second-order belief changes from measures of perceived inconsistency, a question arises whether all non-targeted beliefs will be equally susceptible. Second-order belief change processes are likely to follow either a probabilistic- or an evaluative-consistency rule (Fishbein and Ajzen 1975). Probabilistic consistency refers to updating which agrees with perceptions of

interattribute correlations. The recipient of a negative message thus might update beliefs about only those attributes that are perceived to be correlated with the targeted product attribute, in which case the magnitude of each observed change would correspond to the magnitude of the respective correlation. Evaluative consistency, on the other hand, refers to updating which agrees with the evaluative tone of the claim. The recipient of a negative message thus might update beliefs about all product attributes in an evaluatively negative way.

Dick, Chakravarti, and Biehal (1990) have argued that probabilistic consistency rules are more diagnostic for attribute value judgments, although their application requires more cognitive effort than is true of evaluative consistency rules. Individuals are likely to prefer the use of probabilistic consistency rules, therefore, as long as their processing requirements can be met. Given the evidence that negative information is heavily processed *per se*, cognitive requirements of a probabilistic rule would not seem to be a deterrent. It thus seems most likely that second-order belief change in response to a negative product claim will follow a probabilistic consistency rule.

Although positive information may be sufficiently inconsistent to elicit second-order effects, cognitive processing of positive claims is expected to be relatively low. Given the high processing requirements of a probabilistic consistency rule, therefore, it is not likely that such rules will hold when messages are positively valenced. Instead, a less effortful evaluative consistency rule may apply such that second-order belief change which follows from positive information will not depend on attribute correlations, and will invariably be favorably valenced.

Attitude Change

Changes in targeted attribute beliefs are likely to effect changes in attitude. The relationship between non-targeted belief change and attitude is less clear. Given differences in the depth of processing of positive and negative claims, one might expect differences in the extent to which non-targeted belief changes mediate the relationship between targeted belief change and attitude change. Heavy processing of negative message claims combined with the cognitive effort devoted to a probabilistic consistency rule make it likely that the mediation effect will be significant. Weaker processing of positive message claims and less effortful use of an evaluative consistency rule make the mediation effect less likely.

Some Existing Evidence

Lutz (1975a) reports an experiment in which a change in subjects' beliefs about a single stimulus attribute led to changes in total cognitive structure. Significantly, however, the observed changes in cognitive structure were greater when the stimulus belief-change message was negative rather than positive. Similarly, Mizerski (1982), in an attitude formation study, found that negative messages led recipients to make stronger inferences to unknown product attributes than did positive product claims. Although Lutz suggests that "serendipitous changes in other cognitive elements" (p.55) are responsible for the observed changes in total cognitive structure, he does not report individual changes in attribute beliefs or importances. Mizerski, on the other hand, reports attribute level belief changes, but only for those attributes that were strongly related to the target. Neither study allows for a comparison of second-order effects across attributes that vary in

correlation with the targeted product feature. Furthermore, neither controls for claim inconsistency.

Lutz (1975b) further analyzed the cognitive structure data to determine whether second-order effects were significantly related to attitude change. Although the analysis suggests that second-order effects account for more of the variance in attitude change than do first-order, or targeted effects, this is inferred from the parameters of a regression model relating attitude change to first-order and second-order effects. Given the likely correlation of these latter two measures, interpretation of the regression coefficients is problematic. Greater insight can be gained by testing directly for mediation effects.

These three studies offer encouragement for further investigation of the relationship between message valence, non-targeted belief change, and attitude change. Important unanswered questions, however, concern differences in second-order effects as a function of message valence and consistency, and consequent differences in their mediation effects.

HYPOTHESES

The preceding discussion suggests four research hypotheses to be tested in the current study:

H1: Recipients of negative product claims will perceive stronger claim inconsistency with prior beliefs than will recipients of positive product claims.

H2: Highly inconsistent product claims will give rise to greater change in targeted attribute beliefs than will less inconsistent claims. The effect will be stronger for all levels of inconsistency when messages are negatively valenced.

H3: Highly inconsistent product claims will give rise to second-order changes in non-targeted attribute beliefs. Second-order effects will conform to a probabilistic consistency rule when message valence is negative and to an evaluative consistency rule when message valence is positive.

No explicit hypotheses were formulated for changes in attribute importance. On the basis of previous research it might be argued that the targeted attribute would receive heavier weight in evaluation tasks when product claims are negative rather than positive, and when message inconsistency is high (Fiske 1980). We thus might expect greater change in the importance of the targeted attribute under negative and high inconsistency conditions. As discussed above, however, overweighting of new product claims would do little to facilitate their integration within the existing cognitive structure. In an attitude change situation, therefore, it might be argued that attribute importances do not vary systematically with message valence or inconsistency.

In consideration of these conflicting arguments, hypotheses were not explicitly formulated for importance change. In spite of this indeterminacy, however, it was desirable to consider how changes in cognitive structure--both attribute beliefs and importances--would effect changes in overall attitude. Rather than looking at how changes in beliefs and importances for both targeted and non-

targeted attributes could possibly combine to produce attitude change, the last hypothesis is based on the argument that negative and positive information are subject to differing levels of processing intensity. A reasonable conclusion from this argument is that second-order effects which follow from negative information will be more likely to mediate the relationship between first-order effects and attitude change. We would expect the effect to be moderated, however, by the level of claim inconsistency. Given weak second-order effects in response to low inconsistency messages, it is not reasonable to expect strong mediation.

H4: When message valence is negative and claim inconsistency is high, second-order changes in non-targeted attribute beliefs and importances will mediate the relationship between targeted changes in cognitive structure and attitude change. Mediation will not be significant when message inconsistency is low or message valence is positive.

METHOD

Design and Stimulus Materials

The study employed a 2 (message valence) x 2 (message inconsistency) randomized between-subjects design with control groups. No direct analyses were performed on the control group data; instead, average results from these groups (who saw neutral messages about the target brand) were used as pretest measures for calculating changes in the beliefs and importance weights of the experimental groups. Although it would have been desirable to use a pretest-posttest design for the current research, the potential for demand effects was judged to be exceedingly high. The use of control groups as a proxy for pretest measures alleviates this

concern. Random assignment of the research subjects to groups minimizes the risk that control groups differed systematically from the experimental groups.

Manipulation checks reported below add further assurances of group equivalence.

Video cameras were chosen as the product category for the research on the basis of pretest results showing differences in the magnitudes of perceived correlations among the product's attributes. As second-order belief changes based on probabilistic consistency are expected to vary with the magnitude of attribute correlations, a complete analysis of second-order effects requires such differences across attributes. A convenience sample ($n = 12$) with characteristics similar to those of the research sample was asked to rate 15 pairs of camera attributes to indicate their strength of association. Following John, Scott, and Bettman (1986), ratings were collected on a 21-point scale with labels "perfectly negatively related" (-10), "unrelated" (0), and "perfectly positively related" (+10). An introductory paragraph explained the meaning of these labels and also defined each rated attribute. Results showed that light adaptation (the ability of the camera to adjust to varying light conditions, hereafter referred to as ADAPT) was strongly related to picture sharpness and color accuracy (average ratings of 5.75 and 6.08 for SHARP and COLOR, respectively) and was weakly related to weight and sound quality (average ratings of 1.58 and 1.75 for WEIGHT and SOUND, respectively)². On the basis of these results, light adaptation was selected as the target attribute for treatment messages.

Message inconsistency was manipulated by varying the description of the targeted brand. Stimulus materials, as seen in Figure 1, showed four brands of camera of which one (Alpha) was clearly superior to the others and one (Gamma) was clearly inferior. Of the remaining two brands Beta was found in pretesting to be

evaluated moderately favorably whereas Delta was found to be evaluated moderately unfavorably. In addition, the more favorable brand was designed to be relatively strong on SHARP and COLOR - attributes that are related to the target attribute - whereas the more unfavorable brand was relatively weak on those two attributes. A negative rating of the favorable brand's (i.e., Beta's) light adaptation ability thus would be both evaluatively and logically inconsistent with the brand's other characteristics whereas a positive rating would be both evaluatively and logically consistent. The opposite is true for the unfavorable brand (i.e., Delta), where a negative rating would be consistent with the other brand features but a positive message would be inconsistent.

Insert Figure 1 about here

Valence was manipulated with positive and negative messages which were equally polarized from a neutral scale point. A pretest sample (n=12) was shown the description of a light adaptation test that appears in Figure 2 and was told that it represents information from a consumer buying guide. They then were asked to rate 20 hypothetical brand evaluations to indicate their degree of positivity or negativity. Ratings were collected on an 11-point scale with labels "extremely negative" (-5), "neutral" (0), and "extremely positive" (+5). On the basis of these measures two messages with equally positive and negative ratings were identified. In addition, a neutral message was selected for use with control group subjects. The messages and their ratings are shown in Figure 2.

Insert Figure 2 about here

By combining the two target brands with the three message valences, six stimulus messages were formed. A positive message about brand Beta constituted the positive/low-inconsistency (PLO) manipulation, whereas a negative message constituted the negative/high-inconsistency (NHI) manipulation. Similarly, a positive message about brand Delta constituted the positive/high-inconsistency (PHI) manipulation, whereas a negative message constituted the negative/low-inconsistency (NLO) manipulation. Finally, the control groups received a neutral message about either Beta or Delta.

A test was conducted to verify that these brand/message combinations conformed to the required patterns of inconsistency. A convenience sample of subjects ($n=11$) was shown the product descriptions for Beta and Delta, following which they saw the description of the light adaptation test. They then were asked to rate both the negative and positive messages on a 7-point scale (labelled extremely consistent and extremely inconsistent at the endpoints) to indicate message consistency with the brand descriptions. As expected, the negative message was considered to be *more* inconsistent than the positive message with the Beta description (average ratings of 5.09 and 3.91, respectively) whereas it was considered to be *less* inconsistent than the positive message with the Delta description (average ratings of 3.91 and 4.91, respectively). Furthermore, ratings of the two high inconsistency messages did not differ significantly from one another, nor did those of the two low inconsistency messages (paired-comparison $t=0.32$, $p=.76$ for high inconsistency; $t=0.00$, $p=1.0$ for low inconsistency).

Subjects and Procedure

Subjects were 209 MBA students enrolled in an introductory marketing course at a graduate-level business school who participated as a partial course requirement. They were told that the purpose of the research was to study the effects of consumer purchasing guides on product opinions. Fifteen of the initial 209 respondents were deleted from the data set because of incomplete or unusable results.

Subjects were first instructed to examine the brand information presented in Figure 1. They were informed that the information had been copied from a consumer purchasing guide and that fictitious brand names had been used in order to avoid the tendency to draw upon prior knowledge of the brands. After reviewing this material, subjects indicated on a 7-point scale how likely it was (not at all/extremely) that they would purchase each of the four brands if they were in the market for this type of product. Additionally, they evaluated each of the brands on three 7-point scales labelled good/bad, negative/positive and unfavorable/favorable at the endpoints. The purpose of this initial evaluation stage was to assure that subjects had carefully read the attribute information and to force them to form an initial opinion about each of the brands. During this task subjects were free to refer back to the matrix of brand information.

The experimental manipulation was delivered in the second part of the questionnaire. Subjects were told that the purchasing guide included information about an additional attribute for which the cameras had been tested in a laboratory setting. They then saw either the neutral, the positive, or the negative evaluation of the target brand according to group assignment. Subjects were allowed to examine

the stimulus material at their own pace, but they were informed that they would not be able to refer back to it once they had turned past it.

Immediately after examining the stimulus material subjects were asked to write down as many thoughts as they could remember having while reading the preceding page. As this measure did not pertain to the current research, it will not be further discussed. After the thought listing exercise, subjects indicated their beliefs about ADAPT, SHARP, COLOR, WEIGHT, and SOUND for the target brand on 7-point semantic differential scales. Posttest attitudes toward the target brand were measured using the three scales described above, and attribute importances were measured using a 100-point constant sum scale. Finally, subjects were asked to indicate on 7-point scales how accurate, credible and trustworthy (not at all/entirely) they felt the camera report to be, and how consistent the stimulus message had been (extremely consistent/extremely inconsistent) with their prior impressions of the target brand.

RESULTS

Manipulation Checks

A series of tests was run to assure that subjects had perceived the stimulus materials as intended. The first test verified that the neutral stimulus message had no effect on control group evaluations of the target brands. A series of t-tests confirmed that neither changes in attitude nor changes in purchase likelihood, as assessed by the difference in postmessage and premessage ratings, were significantly different from zero for either of the two control groups (average attitude change was -0.14 , $t = -1.06$, $p = 0.30$ and -0.09 , $t = -0.49$, $p = 0.63$ for Beta and Delta respectively;

average purchase likelihood change was -0.15 , $t=-0.82$, $p=0.42$ and -0.11 , $t=-0.51$, $p=0.61$ respectively).

A second test verified that premessage brand evaluations did not differ by group. A between-subjects ANOVA on initial purchase intentions with brands as a within-subjects factor found no differences across the six groups for any of the four described brands ($F=0.12$, $p=0.95$). Results were similar when attitude was the dependent measure ($F=0.34$, $p=0.80$). On the basis of these tests we can conclude that differences in attitude change across the experimental groups are due to differences in the experimental manipulation rather than to premessage differences in groups.

A final test verified that the stimulus messages were equally credible to all groups. An index was formed by averaging the accuracy, credibility and trustworthiness scales described above. Average ratings ranged from 4.47 to 4.89, suggesting that the report was reasonably credible for all groups. A between-subjects ANOVA showed no differences in credibility across groups ($F=0.78$, $p=0.51$).

Perceived Inconsistency

The first hypothesis states that perceived inconsistency will be higher among recipients of negative rather than positive product claims. Figure 3 shows average ratings for the four experimental groups. As hypothesized, the figure shows clearly that negative messages systematically were perceived to be more inconsistent with prior beliefs than were similar positive claims. A between-subjects ANOVA confirms this result with a main effect of valence ($F=21.83$, $p<.001$) in addition to that of inconsistency ($F=9.77$, $p=.002$).

Insert Figure 3 about here

Figure 3 also shows results of the calibration sample that was used to design messages with equal inconsistency across the two valence conditions. Comparing results across the two samples it is interesting to note that, unlike positive message recipients who systematically viewed messages as being less inconsistent than the calibration sample, subjects in the NLO condition viewed the product claim as being more inconsistent with prior beliefs than did the calibration sample.

Discussion. These results strongly support the first hypothesis. It appears that positive message recipients were less aware than negative message recipients of claim inconsistency with previously learned brand information. Although the result is generally consistent with arguments that negative information is more thoroughly and systematically processed, the response of the NLO group presents somewhat of an anomaly. We might expect careful processing of the NLO stimulus message to produce a level of perceived inconsistency similar to that of the calibration sample. As actual response was stronger than expected, there is a suggestion of biased processing. Of primary interest for the current research was whether this apparent bias in perception would carry over to targeted and non-targeted attribute belief change.

Belief Change

Table 1 shows average levels of belief change for each experimental group³. In order to yield more stable measures for the non-targeted beliefs, results were averaged across SHARP and COLOR to form a single measure for related

attributes, and across WEIGHT and SOUND to form a single measure for unrelated attributes. Prior to testing the second and third hypotheses, a repeated measures ANOVA was used to test for differences in the pattern of belief change across the three attribute types (targeted, related, and unrelated). Message valence and inconsistency were between-subjects effects. In order to compare magnitudes rather than directions, scaling was reversed for the negative message conditions. A significant interaction of attribute type with valence ($F=80.46$, $p<.001$) and a marginal interaction with inconsistency ($F=2.53$, $p=.08$) indicate that results differ across attribute type, so that each must be analyzed separately.

Targeted Beliefs. As can be seen in Table 1, targeted belief change was significant for each of the experimental groups. According to the second hypothesis, the magnitude of this change across groups should show a main effect of both valence and inconsistency. Whereas claim inconsistency drives the underlying effect, greater awareness of the magnitude of inconsistency should enhance the effect in the case of negative messages.

 Insert Table 1 about here

The hypothesis was tested in a between-subjects ANOVA with valence and inconsistency as independent variables. In accordance with the hypothesis, there was a significant effect of valence ($F=183.82$, $p<.001$) showing that belief change was stronger in the negative cells. In contrast, however, the effect of claim inconsistency was only marginal ($F=2.88$, $p=.09$). From Table 1 it can be seen that the effect of inconsistency was as hypothesized in positive message conditions, but it was negligible in the negative cells. Consistent with the test of H1, it appears that

recipients of NLO stimulus claims responded more strongly than might have been predicted. Given higher than expected levels of perceived inconsistency among this group, the high level of belief change is not surprising.

Non-targeted Beliefs. The third hypothesis states that non-targeted attribute beliefs will be subject to second-order effects when message inconsistency is high. In addition, the second-order effects are expected to conform to a probabilistic consistency rule in the case of a negative product claim, and to an evaluative consistency rule in the case of a positive product claim. On the basis of this hypothesis, we would expect to see strong change in related attribute beliefs for both the PHI and NHI conditions, resulting in a main effect of message inconsistency. Additionally, we would expect strong change in unrelated beliefs for the PHI condition, resulting in a valence-inconsistency interaction.

As can be seen in Table 1, results in the two negative cells support the third hypothesis. When message inconsistency was low, subjects updated neither related nor unrelated beliefs. When message inconsistency was high, on the other hand, subjects updated beliefs about only the attributes related to the target. This is consistent with a probabilistic consistency rule. In positive message conditions, on the other hand, results were as hypothesized when message inconsistency was high, but not when it was low. In the former case, subjects updated beliefs about both related and unrelated product attributes. As the strength of the effect did not vary across attribute type it appears that an evaluative consistency rule was used. Similarly, when message inconsistency was low, subjects unexpectedly updated both related and unrelated attribute beliefs. Again, results are consistent with an evaluative consistency rule.

Separate ANOVA's were used to test the hypothesis for related and unrelated attributes. When related belief change was the dependent variable results were as hypothesized, with the main effect of inconsistency achieving significance ($F = 10.06, p = .002$). Thus, although related belief change was unexpectedly strong in the PLO condition, it was not sufficiently strong to result in a significant effect of valence nor in a significant interaction. When unrelated belief change was the dependent variable, the hypothesized interaction was not observed. Due to the unanticipated PLO effect, only the main effect of valence was significant ($F = 14.91, p < .001$).

Discussion. The results are supportive of the second and third hypotheses under conditions of high claim inconsistency. Inconsistent negative claims led to a strong change in the targeted belief accompanied by selective change in non-targeted, but related attribute beliefs. Inconsistent positive claims, on the other hand, led to a weaker change in the targeted belief and non-selective updating of all other attribute beliefs. The pattern of results indicates that a probabilistic consistency rule was applied when message valence was negative, whereas an evaluative consistency rule was applied when valence was positive.

Interesting deviations from the hypotheses appear in the two low inconsistency cells. When message valence was negative, targeted belief change was stronger than expected but non-targeted belief change was according to hypothesis. In contrast, when message valence was positive, targeted belief change followed the hypothesis but non-targeted belief change was stronger than expected.

These results can be explained with some modification of our initial conceptual framework. Initially it was argued that recipients of both positive and negative claims would systematically operate on perceived claim inconsistency to

produce second-order belief changes. In light of current results, and following the argument that positive information is shallowly processed, it now appears less likely that recipients of positive messages **engage in effortful analysis** and utilization of inconsistency information. A more reasonable possibility is that positive message recipients detect claim inconsistency with low precision, and that belief updating is enacted in accordance with these perceptions but with little cognitive effort. Thus, message recipients may have a sense that new information is either slightly better than prior beliefs or much better than prior beliefs, so that invocation of a rule such as "good on this attribute means good on all others" leads to the updating of *all* beliefs to an extent that is roughly small or large. Given low levels of processing intensity, the results of the updating process lack the precision that is seen in the negative information cells.

In contrast, heavy processing of negative product claims may lead to the recognition of an inconsistency threshold below which second-order belief change seems unwarranted. Although perceived inconsistency of the NLO stimulus message was greater than anticipated, it may have been insufficiently large to surpass this threshold level. Claim consistency thus creates a barrier to second-order effects in the negative information case that is absent when message claims are positive.

An alternative explanation is that processing of the NLO message was relatively weak, leading to biased perception and weak second-order effects. This hypothesis seems less tenable in view of the positive information results. Given equivalent levels of perceived inconsistency in the NLO and PHI conditions, limited processing of the NLO stimulus message should lead to evaluative updating of non-

targeted beliefs which parallel those observed in the PHI cell. As this did not occur, a threshold explanation seems more likely.

Importance Change

Although no explicit hypotheses were formulated for attribute importances, their measurements were analyzed in the same way as attribute beliefs. Following the procedures described above, changes in attribute importance were calculated for each experimental group. Results appear in Table 1. An examination of the table shows that, following delivery of the stimulus message, attribute importances changed only weakly. The only significant effects were for related product attributes in the case where product claims were positive. Despite the weakness of the effects, however, a pattern appears in the table. Specifically, the importance of the targeted product attribute generally increased while that of the related attributes declined. Moreover, importance changes were systematically stronger when message inconsistency was high and when message valence was positive.

Data were analyzed in a repeated measures ANOVA using attribute type as the within-subjects effect and valence and inconsistency as between-subjects effects. In order to compare magnitudes rather than directions, scales of the related attributes were reversed. ANOVA showed no significant interactions of the within and between variables ($F=1.27$, $p=.29$ for inconsistency/attribute type; $F=1.07$, $p=.35$ for valence/attribute type; $F=0.56$, $p=.57$ for the three-way interaction), indicating a similar pattern of results for the three attribute types. Multivariate tests of the between-subjects effects showed the main effects of both valence and inconsistency to approach significance ($F=2.37$, $p=.13$ and $F=2.31$, $p=.13$, respectively).

Discussion. In contrast to the differential weighting hypothesis, stimulus messages in this experiment produced only weak changes in attribute importance. Moreover, the marginal effect of valence suggests that importances may change more in response to positive rather than negative product claims. One explanation of this result is that extensive processing of information about attribute beliefs distracted negative message recipients from considering attribute importance. Positive message recipients, on the other hand, may have updated their perceptions of importance in a heuristic fashion similar to that used for attribute beliefs, e.g., "This attribute is good; it must also be important". Given the weakness of the observed effects, however, this interpretation must be viewed with some care.

Attitude Change

The fourth hypothesis states that second-order changes in cognitive structure will mediate the relationship between first-order effects and attitude change in the case where message valence is negative and message inconsistency is high. When messages are positive or claim inconsistency is low, mediation is not expected. The hypothesis was tested in accordance with a procedure proposed by Baron and Kenny (1986). Data for the test were produced by multiplying attribute beliefs by their respective importance weights and subtracting from this for each individual the average value of the measure in the respective control group. Results were then aggregated across individual attributes to produce single measures for both the related and unrelated attribute types.

Table 2 shows the results of the mediation test for each of the experimental groups. Numbers in the table are t-values produced by the three regressions required for the test. Succinctly, the test requires that 1) a regression of attitude

change on first-order effects be significant, 2) a regression of second-order effects on first-order effects be significant, and 3) in a regression of attitude change on both first- and second-order effects, the latter be significant. In addition, the parameter value of the first-order effect must be smaller in the third regression than in the first.

In accordance with the fourth hypothesis, the three parts of the test were satisfied in the NHI condition for related product attributes. In the first two regressions, first-order effects are shown to have a significant effect on both attitude change and second-order effects. In the third regression, the second-order effects were marginally significant at $\alpha = .08$. Although a stronger effect would have been desirable, the result is not surprising given correlation of the two variables in the stage 3 regression (Baron and Kenny 1986). Our confidence in the mediation effect is increased by the result that the parameter associated with the first-order effect declined in the third regression (0.027 in regression 1 versus 0.022 in regression 3). For the remaining three groups, as well as for unrelated attributes in the NHI group, the test fails at stage two. This unambiguously indicates a failure of the mediation test.

Discussion. The results strongly support the fourth hypothesis. Despite the significance of non-targeted belief and importance changes in the positive message conditions, these effects did not mediate the relationship between changes in cognitive structure for the targeted attribute and attitude change. When product claims were negative, on the other hand, second-order effects which followed from processing of an inconsistent claim had a significant mediational effect. Although processing of the low inconsistency claim may have been strong, it resulted in no second-order effects and, consequently, mediation was not observed.

GENERAL DISCUSSION

In a 1984 review of the negativity literature Kanouse suggested that more effort be devoted to understanding the processes by which information valence affects decision making. The current study takes a step in that direction, yielding some interesting results. A principal finding of the current research is that the differential weighting hypothesis is an insufficient explanation for negativity effects in an attitude change situation. Importance weights associated with attribute beliefs changed very little as a consequence of exposure to stimulus messages. Moreover, when change was observed, it was more likely to follow from a positive rather than negative product claim.

A better explanation of the research results is that negative and positive product information are subject to differing processing mechanisms. Negative information appears to be processed more systematically, leading to logical updating of non-targeted attribute beliefs when claim inconsistency is high and attribute relationships are strong. Perhaps as a result of the effort devoted to belief change, importance change in response to negative messages was weak. Positive information, on the other hand, appears to be processed more heuristically, leading to evaluative updating of non-targeted beliefs regardless of claim inconsistency or the strength of attribute relationships. Importance changes were somewhat stronger among positive message recipients, perhaps indicating less distraction from belief change operations.

Whereas belief and importance changes with respect to the targeted product attribute were significantly related to attitude change in each of the experimental groups, changes with respect to non-targeted attributes had a significant effect only in the case of a highly inconsistent negative claim. This

bolsters the argument that positive claims were shallowly processed. In addition, however, it points out the possibility that an inconsistency threshold determines whether second-order effects will be **realized in response** to negative product claims.

These apparent differences in the way that negative and positive product claims are processed imply that marketing practitioners would do well to consider message valence when designing communication strategies. One immediate implication of the current research is that the effects of a negative product claim may often be highly difficult to reverse. Simple attempts to reduce the importance of a derogated attribute or to improve its evaluation often will meet with limited success. As the effects of the negative message may have spread to related product beliefs, some effort may be required to improve the perception of those attributes as well.

An important question for future research is whether knowledge of attribute relationships can be used to direct such remedial efforts. One possibility is that perceptions of a derogated attribute can be more easily improved by indirect attempts to change it. If consumers more readily accept positive claims about an attribute which has not recently been derogated, this type of approach may prove more effective than a direct rebuttal. The task of the communication strategist thus would be to determine the structure of attribute inter-relations, and thereby decide on the link(s) to be exploited in a particular response.

A second implication of the current research is that efforts must be made to maximize the processing of positive claims. This point has direct relevance for the task of responding to negative messages. Given asymmetries in message processing, it may be necessary to employ more than a single positive claim to counter the effects of a negative claim. Whether the use of multiple claims is superior to

attempts at increasing message processing is a question for future research. Factorial designs in which message valence, message repetition, attribute correlations, and processing manipulations are systematically varied will be necessary to improve our understanding of this complex situation.

Limitations

Given that the research was conducted in a controlled environment, generalization of the research conclusions must be done with care. One factor in particular that may have contributed to the current results is source credibility. As consumer purchasing guides are a credible source of both positive and negative product information, they presented a suitable source for the current design. It is quite likely, however, that responses to the stimulus messages would have differed with the use of an alternative source. One possibility is that messages would more often be rejected, leading to a lower overall incidence of belief updating activity, if the source of the message were low in credibility.

Results might also have differed with the use of an alternative product category. As performance features of an electronic device are likely to be associated in consumers' minds, the propensity for second-order belief change may be high. In categories where product features are not mechanically related, the incidence of second-order effects might be lower. A challenge for future research is to determine whether the observed differences in negative and positive message effects are the same under these alternative experimental conditions.

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NOTES

1. A similar argument has been raised by proponents of the "change in meaning" hypothesis which holds that personality traits have different meanings in different contexts (see Ostrom 1977). The current research is similar to this hypothesis in its focus on contextual influences. It differs, however, in proposing a belief change mechanism which is not related to the semantic interpretation of communications.

2. A sixth attribute, length of warranty, was also included in test materials. Although this feature probably contributed to overall brand evaluations, it differs from the other attributes in emphasizing service rather than product performance. It thus is possible that belief change processes related to warranty would differ from those for the other attributes. Although the average change in warranty beliefs was large for some experimental groups, results failed to reach significance, suggesting a great deal of variation about these mean changes. Given potential differences in the hypothesized process of belief change for this attribute, it was excluded from further analysis.

3. Belief change measures were calculated by subtracting the average belief rating of the relevant control group from the belief ratings of each experimental group member. The numbers in the table thus are measures of the average difference between the control and experimental groups.

TABLE 1
BELIEF CHANGE, IMPORTANCE CHANGE, AND ATTITUDE CHANGE

	Message Valence and Level of Inconsistency			
	Negative		Positive	
	Low Inconsistency	High Inconsistency	Low Inconsistency	High Inconsistency
Targeted Belief Change	-3.36 ^a	-3.38 ^a	1.39 ^a	1.71 ^a
Related Belief Change	0.05	-0.67 ^a	0.26 ^b	0.72 ^a
Unrelated Belief Change	0.19	-0.04	0.38 ^a	0.66 ^a
Targeted Importance Change	0.16	1.04	1.07	1.65
Related Importance Change	-0.32	-1.17	-1.11 ^b	-3.03 ^a
Unrelated Importance Change	-0.09	0.38	0.37	1.05
Attitude Change	-0.82 ^a	-1.57 ^a	0.46 ^a	0.78 ^a
n	30	30	34	30

^a Significant at .01

^b Significant at .10

TABLE 2
THE MEDIATING EFFECTS OF SECOND-ORDER CHANGES IN COGNITIVE STRUCTURE

	Message Valence and Level of Inconsistency			
	Negative		Positive	
	Low Inconsistency	High Inconsistency	Low Inconsistency	High Inconsistency
Regression of Attitude Change on First-Order Effects ^a	3.93 ^b	7.94 ^b	4.72 ^b	5.48 ^b
Regression of First-Order Effects on Second-Order Effects				
Related Attributes	0.02	3.86 ^b	-0.47	0.24
Unrelated Attributes	-1.11	-0.72	0.87	-0.11
Regression of Attitude Change on First- and Second-Order Effects				
Related Attributes	1.64	1.79 ^c	1.28	1.42
Unrelated Attributes	1.37	0.65	1.24	1.05

^a Numbers in the table are t-values from the relevant regression

^b Significant at .01

^c Significant at .10

FIGURE 1
STIMULUS MATRIX

Attributes					
Brands	Picture Sharpness	Weight	Sound Quality	Warranty	Color Accuracy
Alpha	9	4.0 lbs	8	1 year	8
Beta	8	4.0 lbs	7	1 year	8
Gamma	5	4.5 lbs	7	1 year	6
Delta	7	4.0 lbs	8	2 years	7

NOTE - Subjects were informed that picture sharpness, sound quality, and color accuracy had been rated on a 10 point scale where 1 means extremely poor and 10 means extremely good.

FIGURE 2
TREATMENT MESSAGES

A comparative test was run to see how the four brands of cameras adjusted to varying light conditions. We used each camera to record a 5 minute video in which we moved from one location to another, with different lighting conditions present in each location. We started the filming outside in the shade of a tree, following which we moved into the bright sunlight. Next we walked into the testing laboratory where there was strong overhead lighting, and finally we turned off the laboratory lights and recorded with only the sunlight shining through the windows.

Valence	Message	Average Rating	Standard Deviation
Negative	Adjusted slowly to change Very bad performance	-4.67	0.49
Neutral	Satisfactory adjustment to change Adequate performance	0.67	0.65
Positive	Adjusted quickly to change Excellent performance	4.67	0.65

NOTE - Message valence was rated on an 11-point scale labeled "extremely negative" (- 5) and "extremely positive" (+ 5) at the endpoints.

FIGURE 3
INCONSISTENCY OF STIMULUS MESSAGES
WITH PRIOR BRAND KNOWLEDGE

Perceived
Inconsistency

6
5
4
3
2

Negative

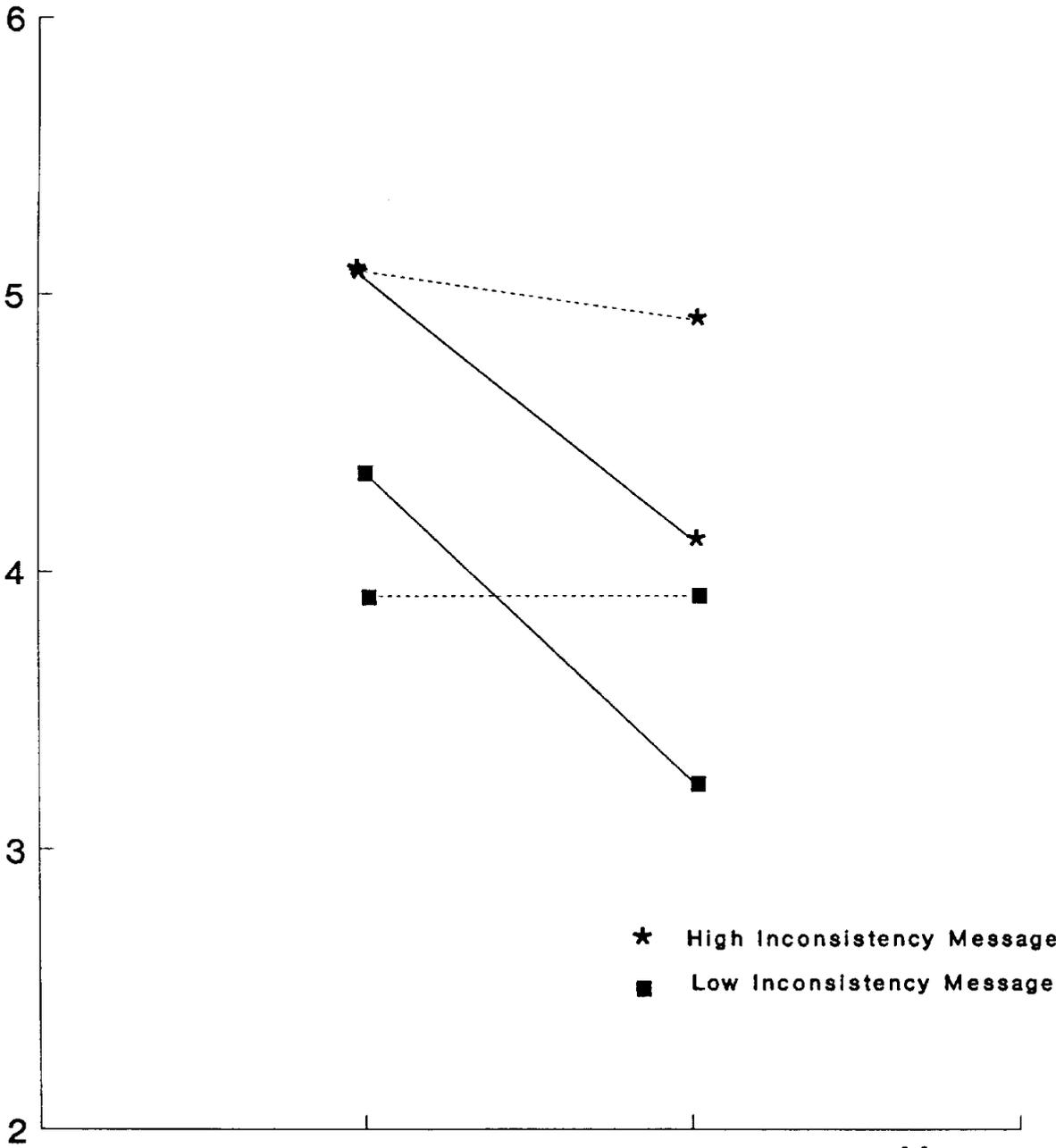
Positive

Message
Valence

Test Sample
Calibration Sample

* High Inconsistency Message
■ Low Inconsistency Message

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89/56	Wilfried VANHONACKER and Lydia PRICE	"On the practical usefulness of meta-analysis results", September 1989.			
			<u>1990</u>		
89/57	Tackwon KIM, Lars-Hendrik RÖLLER and Mihkel TOMBAK	"Market growth and the diffusion of multiproduct technologies", September 1989.	90/01 TM/EP/AC	B. SINCLAIR-DESGAGNÉ	"Unavoidable Mechanisms", January 1990.
89/58 (EP,TM)	Lars-Hendrik RÖLLER and Mihkel TOMBAK	"Strategic aspects of flexible production technologies", October 1989.	90/02 EP	Michael BURDA	"Monopolistic Competition, Costs of Adjustment, and the Behaviour of European Manufacturing Employment", January 1990.
89/59 (OB)	Manfred KETS DE VRIES, Daphna ZEVADI, Alain NOEL and Mihkel TOMBAK	"Locus of control and entrepreneurship: a three-country comparative study", October 1989.	90/03 TM	Arnoud DE MEYER	"Management of Communication in International Research and Development", January 1990.
89/60 (TM)	Enver YUCESAN and Lee SCHRUBEN	"Simulation graphs for design and analysis of discrete event simulation models", October 1989.	90/04 FIN/EP	Gabriel HAWAWINI and Eric RAJENDRA	"The Transformation of the European Financial Services Industry: From Fragmentation to Integration", January 1990.
89/61 (All)	Susan SCHNEIDER and Arnoud DE MEYER	"Interpreting and responding to strategic issues: The impact of national culture", October 1989.	90/05 FIN/EP	Gabriel HAWAWINI and Bertrand JACQUILLAT	"European Equity Markets: Toward 1992 and Beyond", January 1990.

90/06 FIN/EP	Gabriel HAWAWINI and Eric RAJENDRA	"Integration of European Equity Markets: Implications of Structural Change for Key Market Participants to and Beyond 1992", January 1990.	90/17 FIN	Nathalie DIERKENS	"Information Asymmetry and Equity Issues", Revised January 1990.
90/07 FIN/EP	Gabriel HAWAWINI	"Stock Market Anomalies and the Pricing of Equity on the Tokyo Stock Exchange", January 1990.	90/18 MKT	Wilfried VANHONACKER	"Managerial Decision Rules and the Estimation of Dynamic Sales Response Models", Revised January 1990.
90/08 TM/EP	Tawfik JELASSI and B. SINCLAIR-DESGAGNÉ	"Modelling with MCDSS: What about Ethics?", January 1990.	90/19 TM	Beth JONES and Tawfik JELASSI	"The Effect of Computer Intervention and Task Structure on Bargaining Outcome", February 1990.
90/09 EP/FIN	Alberto GIOVANNINI and Jae WON PARK	"Capital Controls and International Trade Finance", January 1990.	90/20 TM	Tawfik JELASSI, Gregory KERSTEN and Stanley ZIONTS	"An Introduction to Group Decision and Negotiation Support", February 1990.
90/10 TM	Joyce BRYER and Tawfik JELASSI	"The Impact of Language Theories on DSS Dialog", January 1990.	90/21 FIN	Roy SMITH and Ingo WALTER	"Reconfiguration of the Global Securities Industry in the 1990's", February 1990.
90/11 TM	Enver YUCESAN	"An Overview of Frequency Domain Methodology for Simulation Sensitivity Analysis", January 1990.	90/22 FIN	Ingo WALTER	"European Financial Integration and Its Implications for the United States", February 1990.
90/12 EP	Michael BURDA	"Structural Change, Unemployment Benefits and High Unemployment: A U.S.-European Comparison", January 1990.	90/23 EP/SM	Damien NEVEN	"EEC Integration towards 1992: Some Distributional Aspects", Revised December 1989
90/13 TM	Soumitra DUTTA and Shashi SHEKHAR	"Approximate Reasoning about Temporal Constraints in Real Time Planning and Search", January 1990.	90/24 FIN/EP	Lars Tyge NIELSEN	"Positive Prices in CAPM", January 1990.
90/14 TM	Albert ANGEHRN and Hans-Jakob LÜTHI	"Visual Interactive Modelling and Intelligent DSS: Putting Theory Into Practice", January 1990.	90/25 FIN/EP	Lars Tyge NIELSEN	"Existence of Equilibrium in CAPM", January 1990.
90/15 TM	Arnoud DE MEYER, Dirk DESCHOOLMEESTER, Rudy MOENAERT and Jan BARBE	"The Internal Technological Renewal of a Business Unit with a Mature Technology", January 1990.	90/26 OB/BP	Charles KADUSHIN and Michael BRIMM	"Why networking Fails: Double Binds and the Limitations of Shadow Networks", February 1990.
90/16 FIN	Richard LEVICH and Ingo WALTER	"Tax-Driven Regulatory Drag: European Financial Centers in the 1990's", January 1990.	90/27 TM	Abbas FOROUGH and Tawfik JELASSI	"NSS Solutions to Major Negotiation Stumbling Blocks", February 1990.
			90/28 TM	Arnoud DE MEYER	"The Manufacturing Contribution to Innovation", February 1990.

90/29 FIN/AC	Nathalie DIERKENS	"A Discussion of Correct Measures of Information Asymmetry", January 1990.	90/40 OB	Manfred KETS DE VRIES	"Leaders on the Couch: The case of Roberto Calvi", April 1990.
90/30 FIN/EP	Lars Tyge NIELSEN	"The Expected Utility of Portfolios of Assets", March 1990.	90/41 FIN/EP	Gabriel HAWAWINI, Itzhak SWARY and Ik HWAN JANG	"Capital Market Reaction to the Announcement of Interstate Banking Legislation", March 1990.
90/31 MKT/EP	David GAUTSCHI and Roger BETANCOURT	"What Determines U.S. Retail Margins?", February 1990.	90/42 MKT	Joel STECKEL and Wilfried VANHONACKER	"Cross-Validating Regression Models in Marketing Research", (Revised April 1990).
90/32 SM	Srinivasan BALAK- RISHNAN and Mitchell KOZA	"Information Asymmetry, Adverse Selection and Joint-Ventures: Theory and Evidence", Revised, January 1990.	90/43 FIN	Robert KORAJCZYK and Claude VIALLET	"Equity Risk Premia and the Pricing of Foreign Exchange Risk", May 1990.
90/33 OB	Caren SIEHL, David BOWEN and Christine PEARSON	"The Role of Rites of Integration in Service Delivery", March 1990.	90/44 OB	Gilles AMADO, Claude FAUCHEUX and André LAURENT	"Organisational Change and Cultural Realities: Franco-American Contrasts", April 1990.
90/34 FIN/EP	Jean DERMINE	"The Gains from European Banking Integration, a Call for a Pro-Active Competition Policy", April 1990.	90/45 TM	Soumitra DUTTA and Piero BONISSONE	"Integrating Case Based and Rule Based Reasoning: The Possibilistic Connection", May 1990.
90/35 EP	Jae Won PARK	"Changing Uncertainty and the Time-Varying Risk Premia in the Term Structure of Nominal Interest Rates", December 1988, Revised March 1990.	90/46 TM	Spyros MAKRIDAKIS and Michèle HIBON	"Exponential Smoothing: The Effect of Initial Values and Loss Functions on Post-Sample Forecasting Accuracy".
90/36 TM	Arnoud DE MEYER	"An Empirical Investigation of Manufacturing Strategies in European Industry", April 1990.	90/47 MKT	Lydia PRICE and Wilfried VANHONACKER	"Improper Sampling in Natural Experiments: Limitations on the Use of Meta-Analysis Results in Bayesian Updating", Revised May 1990.
90/37 TM/OB/SM	William CATS-BARIL	"Executive Information Systems: Developing an Approach to Open the Possibles", April 1990.	90/48 EP	Jae WON PARK	"The Information in the Term Structure of Interest Rates: Out-of-Sample Forecasting Performance", June 1990.
90/38 MKT	Wilfried VANHONACKER	"Managerial Decision Behaviour and the Estimation of Dynamic Sales Response Models", (Revised February 1990).	90/49 TM	Soumitra DUTTA	"Approximate Reasoning by Analogy to Answer Null Queries", June 1990.
90/39 TM	Louis LE BLANC and Tawfik JELASSI	"An Evaluation and Selection Methodology for Expert System Shells", May 1990.	90/50 EP	Daniel COHEN and Charles WYPLOSZ	"Price and Trade Effects of Exchange Rates Fluctuations and the Design of Policy Coordination", April 1990.

90/51 EP	Michael BURDA and Charles WYPLOSZ	"Gross Labour Market Flows in Europe: Some Stylized Facts", June 1990.	90/63 SM	Sumantra GHOSHAL and Eleanor WESTNEY	"Organising Competitor Analysis Systems", August 1990
90/52 FIN	Lars Tye NIELSEN	"The Utility of Infinite Menus", June 1990.	90/64 SM	Sumantra GHOSHAL	"Internal Differentiation and Corporate Performance: Case of the Multinational Corporation", August 1990
90/53 EP	Michael Burda	"The Consequences of German Economic and Monetary Union", June 1990.	90/65 EP	Charles WYPLOSZ	"A Note on the Real Exchange Rate Effect of German Unification", August 1990
90/54 EP	Damien NEVEN and Colin MEYER	"European Financial Regulation: A Framework for Policy Analysis", (Revised May 1990).	90/66 TM/SE/FIN	Soumitra DUTTA and Piero BONISSONE	"Computer Support for Strategic and Tactical Planning in Mergers and Acquisitions", September 1990
90/55 EP	Michael BURDA and Stefan GERLACH	"Intertemporal Prices and the US Trade Balance", (Revised July 1990).	90/67 TM/SE/FIN	Soumitra DUTTA and Piero BONISSONE	"Integrating Prior Cases and Expert Knowledge In a Mergers and Acquisitions Reasoning System", September 1990
90/56 EP	Damien NEVEN and Lars-Hendrik RÖLLER	"The Structure and Determinants of East-West Trade: A Preliminary Analysis of the Manufacturing Sector", July 1990	90/68 TM/SE	Soumitra DUTTA	"A Framework and Methodology for Enhancing the Business Impact of Artificial Intelligence Applications", September 1990
90/57 FIN/EP/ TM	Lars Tye NIELSEN	Common Knowledge of a Multivariate Aggregate Statistic", July 1990	90/69 TM	Soumitra DUTTA	"A Model for Temporal Reasoning in Medical Expert Systems", September 1990
90/58 FIN/EP/TM	Lars Tye NIELSEN	"Common Knowledge of Price and Expected Cost in an Oligopolistic Market", August 1990	90/70 TM	Albert ANGEHRN	"Triple C': A Visual Interactive MCDSS", September 1990
90/59 FIN	Jean DERMINE and Lars-Hendrik RÖLLER	"Economies of Scale and Scope in the French Mutual Funds (SICAV) Industry", August 1990	90/71 MKT	Philip PARKER and Hubert GATIGNON	"Competitive Effects in Diffusion Models: An Empirical Analysis", September 1990
90/60 TM	Peri IZ and Tawfik JELASSI	"An Interactive Group Decision Aid for Multiobjective Problems: An Empirical Assessment", September 1990	90/72 TM	Enver YÜCESAN	"Analysis of Markov Chains Using Simulation Graph Models", October 1990
90/61 TM	Pankaj CHANDRA and Mihkel TOMBAK	"Models for the Evaluation of Manufacturing Flexibility", August 1990	90/73 TM	Arnoud DE MEYER and Kasra FERDOWS	"Removing the Barriers in Manufacturing", October 1990
90/62 EP	Damien NEVEN and Menno VAN DIJK	"Public Policy Towards TV Broadcasting in the Netherlands", August 1990	90/74 SM	Sumantra GHOSHAL and Nitin NOHRIA	"Requisite Complexity: Organising Headquarters- Subsidiary Relations in MNCs", October 1990

90/75 MKT	Roger BETANCOURT and David GAUTSCHI	"The Outputs of Retail Activities: Concepts, Measurement and Evidence", October 1990	90/87 FIN/EP	Lars Tyge NIELSEN	"Existence of Equilibrium in CAPM: Further Results", December 1990
90/76 MKT	Wilfried VANHONACKER	"Managerial Decision Behaviour and the Estimation of Dynamic Sales Response Models", Revised October 1990	90/88 OB/MKT	Susan C. SCHNEIDER and Reinhard ANGELMAR	"Cognition in Organisational Analysis: Who's Minding the Store?" Revised, December 1990
90/77 MKT	Wilfried VANHONACKER	"Testing the Koyck Scheme of Sales Response to Advertising: An Aggregation-Independent Autocorrelation Test", October 1990	90/89 OB	Manfred F.R. KETS DE VRIES	"The CEO Who Couldn't Talk Straight and Other Tales from the Board Room," December 1990
90/78 EP	Michael BURDA and Stefan GERLACH	"Exchange Rate Dynamics and Currency Unification: The Ostmark - DM Rate", October 1990	90/90 MKT	Philip PARKER	"Price Elasticity Dynamics over the Adoption Lifecycle: An Empirical Study," December 1990
90/79 TM	Anil GABA	"Inferences with an Unknown Noise Level in a Bernoulli Process", October 1990			
90/80 TM	Anil GABA and Robert WINKLER	"Using Survey Data in Inferences about Purchase Behaviour", October 1990	<u>1991</u>		
90/81 TM	Tawfik JELASSI	"Du Présent au Futur: Bilan et Orientations des Systèmes Interactifs d'Aide à la Décision," October 1990	91/01 TM/SM	Luk VAN WASSENHOVE, Leonard FORTUIN and Paul VAN BEEK	"Operational Research Can Do More for Managers Than They Think!," January 1991
90/82 EP	Charles WYPLOSZ	"Monetary Union and Fiscal Policy Discipline," November 1990	91/02 TM/SM	Luk VAN WASSENHOVE, Leonard FORTUIN and Paul VAN BEEK	"Operational Research and Environment," January 1991
90/83 FIN/TM	Nathalie DIERKENS and Bernard SINCLAIR-DESGAGNE	"Information Asymmetry and Corporate Communication: Results of a Pilot Study", November 1990	91/03 FIN	Pekka HIETALA and Timo LÖYTTYNIEMI	"An Implicit Dividend Increase in Rights Issues: Theory and Evidence," January 1991
90/84 MKT	Philip M. PARKER	"The Effect of Advertising on Price and Quality: The Optometric Industry Revisited," December 1990	91/04 FIN	Lars Tyge NIELSEN	"Two-Fund Separation, Factor Structure and Robustness," January 1991
90/85 MKT	Avijit GHOSH and Vikas TIBREWALA	"Optimal Timing and Location in Competitive Markets," November 1990	91/05 OB	Susan SCHNEIDER	"Managing Boundaries in Organisations," January 1991
90/86 EP/TM	Olivier CADOT and Bernard SINCLAIR-DESGAGNE	"Prudence and Success in Politics," November 1990	91/06 OB	Manfred KETS DE VRIES, Danny MILLER and Alain NOEL	"Understanding the Leader-Strategy Interface: Application of the Strategic Relationship Interview Method," January 1990 (89/11, revised April 1990)

91/07 EP	Olivier CADOT	"Lending to Insolvent Countries: A Paradoxical Story," January 1991	91/19 MKT	Vikas TIBREWALA and Bruce BUCHANAN	"An Aggregate Test of Purchase Regularity", March 1991
91/08 EP	Charles WYPLOSZ	"Post-Reform East and West: Capital Accumulation and the Labour Mobility Constraint," January 1991	91/20 MKT	Darius SABAVALA and Vikas TIBREWALA	"Monitoring Short-Run Changes in Purchasing Behaviour", March 1991
91/09 TM	Spyros MAKRIDAKIS	"What can we Learn from Failure?", February 1991	91/21 SM	Sumantra GHOSHAL, Harry KORINE and Gabriel SZULANSKI	"Interunit Communication within MNCs: The Influence of Formal Structure Versus Integrative Processes", April 1991
91/10 TM	Luc Van WASSENHOVE and C. N. POTTS	"Integrating Scheduling with Batching and Lot-Sizing: A Review of Algorithms and Complexity", February 1991	91/22 EP	David GOOD, Lars-Hendrik RÖLLER and Robin SICKLES	"EC Integration and the Structure of the Franco-American Airline Industries: Implications for Efficiency and Welfare", April 1991
91/11 TM	Luc VAN WASSENHOVE et al.	"Multi-Item Lotsizing in Capacitated Multi-Stage Serial Systems", February 1991	91/23 TM	Spyros MAKRIDAKIS and Michèle HIBON	"Exponential Smoothing: The Effect of Initial Values and Loss Functions on Post-Sample Forecasting Accuracy", April 1991 (Revision of 90/46)
91/12 TM	Albert ANGEHRN	"Interpretative Computer Intelligence: A Link between Users, Models and Methods in DSS", February 1991	91/24 TM	Louis LE BLANC and Tawfik JELASSI	"An Empirical Assessment of Choice Models for Software Evaluation and Selection", May 1991
91/13 EP	Michael BURDA	"Labor and Product Markets in Czechoslovakia and the Ex-GDR: A Twin Study", February 1991	91/25 SM/TM	Luk N. VAN WASSENHOVE and Charles J. CORBETT	"Trade-Offs? What Trade-Offs?" April 1991
91/14 MKT	Roger BETANCOURT and David GAUTSCHI	"The Output of Retail Activities: French Evidence", February 1991	91/26 TM	Luk N. VAN WASSENHOVE and C.N. POTTS	"Single Machine Scheduling to Minimize Total Late Work", April 1991
91/15 OB	Manfred F.R. KETS DE VRIES	"Exploding the Myth about Rational Organisations and Executives", March 1991	91/27 FIN	Nathalie DIERKENS	"A Discussion of Correct Measures of Information Asymmetry: The Example of Myers and Majluf's Model or the Importance of the Asset Structure of the Firm", May 1991
91/16 TM	Arnoud DE MEYER and Kasra FERDOWS et.al.	"Factories of the Future: Executive Summary of the 1990 International Manufacturing Futures Survey", March 1991	91/28 MKT	Philip M. PARKER	"A Note on: 'Advertising and the Price and Quality of Optometric Services', June 1991
91/17 TM	Dirk CATTRYSE, Roelof KUIK, Marc SALOMON and Luk VAN WASSENHOVE	"Heuristics for the Discrete Lotsizing and Scheduling Problem with Setup Times", March 1991	91/29 TM	Tawfik JELASSI and Abbas FOROUGHFI	"An Empirical Study of an Interactive, Session-Oriented Computerised Negotiation Support System (NSS)", June 1991
91/18 TM	C.N. POTTS and Luk VAN WASSENHOVE	"Approximation Algorithms for Scheduling a Single Machine to Minimize Total Late Work", March 1991			

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91/31 FIN	Rezaul KABIR and Theo VERMAELEN	"Insider Trading Restrictions and the Stock Market", June 1991	91/44 SM	Sumantra GHOSHAL and Nitin NOHRIA	"Distributed Innovation in the 'Differentiated Network' Multinational", September 1991
91/32 OB	Susan C. SCHNEIDER	"Organisational Sensemaking: 1992", June 1991	91/45 MKT	Philip M. PARKER	"The Effect of Advertising on Price and Quality: An Empirical Study of Eye Examinations, Sweet Lemons and Self-Deceivers", September 1991
91/33 EP	Michael C. BURDA and Michael FUNKE	"German Trade Unions after Unification - Third Degree Wage Discriminating Monopolists?", June 1991	91/46 MKT	Philip M. PARKER	"Pricing Strategies in Markets with Dynamic Elasticities", October 1991
91/34 FIN	Jean DERMINE	"The BIS Proposal for the Measurement of Interest Rate Risk, Some Pitfalls", June 1991	91/47 MKT	Philip M. PARKER	"A Study of Price Elasticity Dynamics Using Parsimonious Replacement/Multiple Purchase Diffusion Models", October 1991
91/35 FIN	Jean DERMINE	"The Regulation of Financial Services in the EC, Centralization or National Autonomy?" June 1991	91/48 EP/TM	H. Landis GABEL and Bernard SINCLAIR-DESGAGNE	"Managerial Incentives and Environmental Compliance", October 1991
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91/37 EP	Ingo WALTER and Hugh THOMAS	"The Introduction of Universal Banking in Canada: An Event Study", August 1991	91/50 SM/TM	Luk VAN WASSENHOVE and Charles CORBETT	"How Green is Your Manufacturing Strategy?" October 1991
91/38 EP	Ingo WALTER and Anthony SAUNDERS	"National and Global Competitiveness of New York City as a Financial Center", August 1991	91/51 MKT	Philip M. PARKER	"Choosing Among Diffusion Models: Some Empirical Guidelines", October 1991
91/39 EP	Ingo WALTER and Anthony SAUNDERS	"Reconfiguration of Banking and Capital Markets in Eastern Europe", August 1991	91/52 EP	Michael BURDA and Charles WYPLOSZ	"Human Capital, Investment and Migration in an Integrated Europe", October 1991
91/40 TM	Luk VAN WASSENHOVE, Dirk CATTRYSSSE and Marc SALOMON	"A Set Partitioning Heuristic for the Generalized Assignment Problem", August 1991	91/53 EP	Michael BURDA and Charles WYPLOSZ	"Labour Mobility and German Integration: Some Vignettes", October 1991
91/41 TM	Luk VAN WASSENHOVE, M.Y. KOVALYOU and C.N. POTTS	"A Fully Polynomial Approximation Scheme for Scheduling a Single Machine to Minimize Total Weighted Late Work", August 1991	91/54 TM	Albert ANGEHRN	"Stimulus Agents: An Alternative Framework for Computer-Aided Decision Making", October 1991
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Robin HOGARTH,
Claude MICHAUD,
Yves DOZ and
Ludo VAN DER HEYDEN

**"Longevity of Business Firms: A Four-Stage
Framework for Analysis", November 1991**

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TM/EP

Bernard SINCLAIR-DESGAGNE

**"Aspirations and Economic Development",
November 1991**