ELSEVIER

Journal of Economic Psychology 16 (1995) 331–349

JOURNAL OF Economic Psychology

Time dependent biases in consumer multi-attribute judgment ☆

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Received 4 August 1993; accepted 4 October 1994

Abstract

In many product choice occasions, the purchase decision is made some time after product information had been acquired, and not concurrently with it. The time that passes between information acquisition and the judgment may have little effect on the judgment itself if all the attributes presented via advertising and in-store selling activities, are consistently positive and advocate the purchase of the product. However, many purchase decisions are also affected by consumer surveys, reports, expert judgment and alike. Under these conditions attribute values may be inconsistent (i.e. some are positive and others are negative). It was hypothesized that delayed judgments may be positively biased under specified conditions. Two experiments, one conducted in a laboratory setting and the other in a field setting, demonstrated that in immediate judgment, when information was vivid in memory, judgments were biased in the negative direction. The effect was amplified when an inconsistency existed among attribute values. However, in the delayed stage, judgments tended to become positively biased. These effects were limited to delayed judgments that relied on recollection of the original information. When delayed judgments relied on recollection of initial judgments, no time-dependent biases were observed.

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0167-4870/95/$09.50
SSDI 0167-4870(95)00005-4

1. Introduction

Consumers do not always make on-the-spot judgments about stores, services and products. Judgments are often memory-based with a time gap separating the first encounter with the object and the formation of the judgment. For example, in considering the replacement of an old TV set, consumers may try to recall details of a previously seen store advertisement offering special purchasing terms; or they may recall factual details of a store visited briefly before going to the movies and form an image of that store, after a delay period. The present study examines the conditions under which judgments may become systematically biased over time even though no external information intervenes over the delay period. We show that delayed judgments are, under certain conditions, more positive than immediate judgments, and we examine the conditions under which this effect occurs.

1.1. Immediate versus delayed judgments and information valence

A fundamental assumption of several notable psychological theories is that judgments are influenced by a comparison of the stimulus to some psychological anchor or reference point (e.g. the typical drugstore is reasonably clean and organized). A central concept in Helson's (1964) theory is the adaptation level which constitutes a psychological anchor determined by past experiences (Helson, 1964). Similarly, the anchoring process in Sherif and Sherif's social judgment theory is guided by persistent attitudes or expectations that form the perceptual anchor (Sherif and Sherif, 1967).

There is mounting evidence suggesting that the psychological anchor that serves as a baseline in judgment formation is moderately positive (e.g. Kaplan, 1976; Parducci, 1965,1968; Sears, 1983; Markus and Zajonc, 1985). For example, Kaplan (1976) found that 80% of all subjects used positive words and provided positive ratings in their judgments of unknown others. This tendency extends to descriptions and judgments of events and objects in general (see Matlin and Stang, 1978, for a review). [1]

The basic contention of the present study is that the role of the psychological reference point in judgment formation may change as the

[1] Data collected as part of a pre-test for the present study among 33 subjects showed that for the studied stimuli the reference point was (significantly) moderately positive.

time gap between the initial exposure to the information and the judgment widens. Specifically, in immediate judgment the positive anchor may lead to negativity bias in judgment, i.e. judgment may be more negative than that implied by an averaging model (For examples of negativity bias in judgment see Fiske, 1980; Kaplan, 1973,1976; Jones and Davis, 1965; Meyer, 1987; Parducci, 1968; Zajonc and Burnstein, 1965). Conversely, in delayed judgment, the positive anchor may lead to positively biased judgments.

There are two main approaches that explain the mechanisms leading to a negativity bias in *immediate judgments*. The first approach consists of the expectancy-contrast theories (see Skowronski and Carlston, 1989, for a review). A contrast effect occurs when a stimulus is *perceived* to be more extreme than it would be otherwise because of comparison of the stimulus with the psychological reference point. Accordingly, a newly encountered negative information (e.g. a store that is not clean) may be misperceived as more negative than it really is if compared with a positive anchor. Consequently, the overall judgment is negatively biased. The second approach, consisting of frequency-weight theories, focuses on the *informativeness* of cues that emanate from the discrepancy between the cues and the expectations. Unexpected cues are postulated to be more informative than expected cues. Since judgers expect information about people and objects to be primarily positive, the negative features of the information receive more weight than the positive features, because they are more distant from normative expectancy (Jones and Davis, 1965; Jones and McGillis, 1976).

The psychological reference point functions differently in *delayed judgments* since such judgments are entirely memory based. Memory decay leads to uncertainty about the true value of the attributes. Hence, the recalled attribute values that serve as input to judgment are likely to be influenced not only by the original attribute values, but also by the reference point, which is the default value of the attribute, or its value under complete uncertainty. This effect can be labeled *regressive recall* since it suggests that when memory decay leads to uncertainty about attribute values, recalled attribute values "regress" to the reference point. Since the reference point is positive, these recalled attribute values will be positively biased (See Ganzach and Krantz, 1991, for a similar phenomenon in prediction). This biased recollection of attribute values will lead to an overall judgment which is positively biased.

Positivity in delayed judgment is observed also when individuals are asked to recall verbal attributes rather than attribute ratings. For example,

Meyer (1987) exposed subjects to a set of alternatives in the course of a multi-attribute learning task. After an intervening exercise, they were requested to recall the features prototypical for the best and worst alternatives. The results showed that subjects were more accurate in recalling the positive features than in recalling the negative ones (see also Matlin and Stang, 1978, for review of additional experimental evidence). This bias is consistent with the time dependent bias in multi-attribute judgments investigated in this study since both forms of positivity (i.e. ratings and verbal recall) are assumed to result from more elaborated schemata prevailing for positive information as opposed to more simple schemata for negative information (e.g. people have better schemata for what constitutes a "good" product than to what constitutes "bad" product, see Meyer, 1987). This may make incoming positive verbal information better integrated, and therefore better remembered than incoming negative information (Anderson et al., 1980; Burnstein and Schul, 1983); or it may result in positive attribute values being more representative of judged products in general thereby implying a positive reference point.

1.2. Conditions affecting positivity in delayed judgment

The upshot of the discussion so far is that the psychological reference point biases delayed judgments to be more positive than immediate judgments. This tendency is further amplified as the inconsistency in the presented information (e.g. a disorganized but clean store) increases. The reason for this lies in the temporal dependence of the effect of inconsistency on multi-attribute judgment. In immediate judgments, the negativity bias increases with information inconsistency. This derives directly from the predictions of both the expectancy-contrast and the frequency-weight approaches. According to the first approach, variability in the information increases the likelihood of the threshold for a contrast effect to be surpassed. Similarly, according to the second approach, variability in the information increases the informativeness of the negative aspects and therefore they receive more weight in the formation of subsequent overall judgments.

On the other hand, in delayed judgment, inconsistency increases positivity since inconsistent cues do not integrate easily and are, therefore, less accessible in memory (Burnstein and Schul, 1983). As a result, the greater the inconsistency in the input information, the higher the uncertainty with regard to the original attribute values which, in turn, increases the influ-

ence of the (positively valued) reference point. Statistically, the foregoing discussion suggests that an interaction between the delay factor (i.e. immediate versus delayed judgments) and the degree of inconsistency in the presented information, is expected.

In contrast to this amplifying factor, an attenuating factor stems from the availability or unavailability of an initial judgment when delayed judgment is made. A delayed judgment (e.g. recommendation about a store one week after a visit) may be based on previously learned factual details (e.g. the store attributes observed by the consumer in his or her first encounter with the store) or it may be based on initial judgments (e.g. a judgment made during this first encounter) (see Lichtenstein and Srull, 1985). While both recall of factual details and recall of initial judgments may be (positively) biased after a delay, it is likely that the former will be more biased than the latter. This is because a judgment is more accessible in memory than factual details and because of the advantage of adopting a readily available judgment over "recomputing" it when a global judgment is required (Higgins and Rholes, 1978; Lichtenstein and Srull, 1985; Sherman et al., 1983; Lingle and Ostrom, 1979; Wyer et al., 1984; Kintsch and Van Dijk, 1978; Chattopadhyay and Alba, 1988; see also Carlston, 1980; Kardes, 1986). We hypothesize, therefore, that delayed judgments will be more positive than immediate judgments when they are based on factual information than when they are based on an initial judgment.

2. Experiment 1

2.1. Method

Subjects

One hundred and fifty undergraduate business students enrolled in an introductory marketing course participated in the experiment during class sessions.

Stimulus

The focal stimulus in the experiment was a new campus located laundry service. The location of the proposed service, the potential need for such a service among students and the lack of any other competing service on campus made the selection of this service particularly relevant for our subjects.

Design

The design was a 2×2 between-subjects design with a third nested factor. The first factor was delay – whether judgments were made immediately or after a delay. The second factor was consistency – whether the multi-attribute descriptions of the service presented to the subjects was consistent or inconsistent. The nested factor involved "reflection" of attribute values, i.e. the attributes that were high for one group were low for the other group, and vice versa. The purpose of the reflection manipulation was to insure that the specific assignment of values to attributes does not underlie the effects of consistency and delay. (The details of the reflection are described in the procedure section below.)

Procedure

Subjects received a short booklet. The first paragraph explained that "In some universities there are laundry services located on the campus. These services allow for students to bring the laundry and receive it ironed and folded two hours later". Subjects were presented with ratings of this service on six attributes (quality, value, variety, service warranty and cleanliness) allegedly taken from a survey conducted in one of the universities in which this service exists. The ratings were given on a 20-point scale. Half of the ratings were above the mid-point of the scale and the rest were below it. For subjects in the high consistency condition there was a small discrepancy in the ratings. For subjects in the low consistency condition there was a large discrepancy in the ratings. The average rating, however, was the same in the two conditions. Within each consistency condition, there were two sets of specific attribute values each constituting a "reflection" of the other. The reflection was executed by setting each of the attribute values in one set equal to 21 minus the value of the corresponding attribute value in the other set. Thus, for example, the values of quality, value, variety, service warranty and cleanliness in the high consistency condition were 16, 5, 18, 3, 4 and 17 in one set, and 5, 16, 3, 18, 17 and 4 in the other.

Two sessions were held with each subject. Subjects were not informed at the time of the first session about the second session. In the first session, all subjects viewed the multi-attribute description of the service, but only subjects in the immediate conditions were requested to make judgments about the service. The judgments were made on a general evaluation scale ranging from 1 to 20. Subjects in the delay conditions were not requested to make any judgments. Instead, they were asked filler questions about the

effectiveness of the multi-attribute format in conveying the essential information. [2]

The second session took place one week later. Subjects were reminded that they had been presented with a description of a laundry service one week previously, and were asked to make another global judgment of the service. Thus, subjects in the delay condition made only delayed judgments. Subjects in the immediate condition made both immediate and delayed judgments. That is, their delayed judgments were made in addition to their immediate judgments made in the first session.

2.2. Results

An analysis of variance was conducted on the effect of delay and consistency on judgment. The analysis revealed no significant effect for reflection ($p > 0.5$), indicating that reflection of attribute values had no effect on judgment. The cell means (collapsing over the "reflection" factor) are plotted in Fig. 1, and the standard deviations are displayed in the figure caption. The main effect for consistency was not significant ($F(1,149) = 1.0$, $p > 0.3$), but the main effect for delay was highly significant ($F(1,149) = 12.4$ $p < 0.0006$), indicating that delayed judgments are higher than immediate judgments.

The interaction between consistency and delay was also significant ($F(1,146) = 4.9$ $p < 0.03$). In agreement with our hypothesis about the conditions affecting positivity in delayed judgment, analysis of simple effect revealed that the effect of delay occurs primarily when information is inconsistent. Delayed judgments were significantly higher than immediate judgments in the low consistency conditions ($F(1,149) = 16.9$ $p < 0.0001$) but not in the high consistency conditions ($F(1,149) = 0.75$, ns). Analysis of simple effects revealed also that judgments of the consistent service were higher than judgments of the inconsistent service in the immediate conditions ($F(1,149) = 5.1$, $p < 0.03$), but not in the delayed conditions ($F(1,149)$ $= 0.73$, ns). Since reflection had no effect, this latter finding is consistent with a negativity bias in judgment (see Barnnick and Barnnick, 1989; Ganzach, 1993). Furthermore, in the delayed conditions, judgments of the

[2] The no-delay subjects were not required to answer the filler questions because this would have resulted in these subjects responding to more questions than delay subjects in the session in which the critical measurements (global evaluation) were taken.

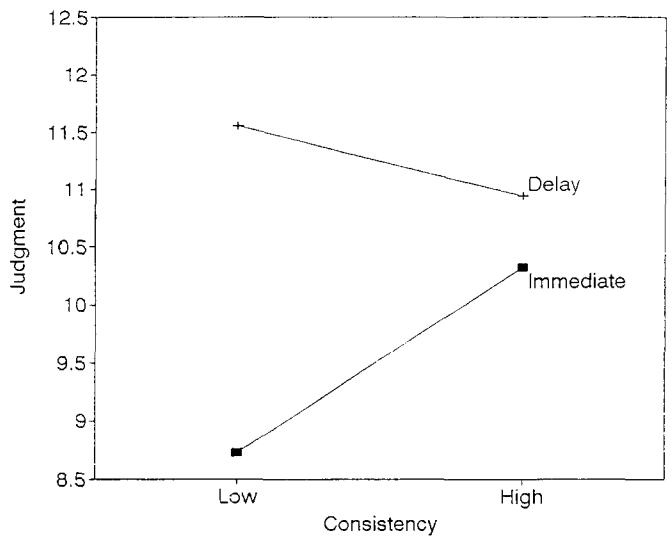

Fig. 1. Mean global judgment of the laundry service in Experiment 1 as a function of delay and consistency. (*Note:* Standard deviations are 3.34 for the delay low consistency condition, 3.14 for the delay high consistency condition, 3.57 for the immediate low consistency condition and 1.71 for the immediate high consistency condition.)

inconsistent service are somewhat higher than those of the consistent service. This is suggestive of positivity in delayed judgments.

To examine the hypothesis about the relationship between positivity and availability of initial judgment we compared delayed and immediate judgments of subjects who were required to make immediate judgments. According to the hypothesis the judgments ought to be similar. This was indeed the case. The mean delayed judgment of these subjects was 8.86 ($SD = 3.95$) in the low consistency condition and 10.30 ($SD = 2.02$) in the high consistency condition. These means do not differ significantly from the means of the immediate judgments ($p > 0.6$, $p > 0.7$ for the low and high consistency condition respectively).

2.3. Discussion

The degree of inconsistency in the presented information has a differential effect on consumer judgments depending upon the timing of judgment formation. The experiment showed that inconsistent profiles lead to more negative immediate judgments than consistent profiles, a finding that

supports the contention of a negativity bias in immediate judgment. However, after a delay interval, the negativity bias disappears: Judgments formed from inconsistent cues improve considerably over time, while no substantial change is observed in judgments formed from consistent cues. Note that this difference cannot be attributed to differences in attribute weights (differences in importance). The lack of significant effect for attribute reflection and the difference in rate of judgment change over time as a function of inconsistency level, make such an argument untenable.

As conceptualized earlier, the interaction between delay and consistency disappears when subjects form a global judgment immediately after the presentation of the information. Time dependent biases were found only when "delay" subjects were not requested to form a global judgment immediately after exposure to the information. Basing their judgment (at least partly) on factual details biased their judgments in the positive direction over the delay interval.

There are few words of caution that should be added. First, the direction of time dependent changes in global judgment may critically depend on the attributes' values. In our experiment the "average" attribute value was below the reference point (that is, the negative attributes were more remote from the reference point than the positive attributes). In this case, regressive recall leads to a positive change over time. However, if the attributes' values are above the reference point, regressive recall may very well lead to a negative change over time.

Second, it should be noted that the reference point is not directly observed in the experiment. Rather, it is used as a theoretical concept from which predictions concerning the effects of consistency and delay on judgment are derived. Therefore, in a follow-up study, we asked subjects ($n = 33$) to evaluate what were the attribute values and overall evaluation of a campus laundry service in a survey conducted among university students. The laundry service was presented to subjects in the same manner described above, except that attribute values were omitted from the description. The mean assessment of the global evaluation obtained in the survey was indeed moderately positive, $M = 12.7$. (The means were 12.1, 13.7 8.9 12.6 10.6 and 12.5 for quality, value, variety, service warranty and cleanliness, respectively.)

Third, our theoretical development is based on the assumption that reliance on factual details (rather than on previous global judgments) results in more favorable newly formed judgments, which is not directly examined in the study. This assumption is examined in Study 2.

3. Experiment 2

The main difference between Experiment 1 and Experiment 2 was the introduction of an additional factor. Under a "recall" condition subjects were instructed to recall the attribute values that had appeared in the original information prior to making the judgment. For this group, a judgment is expected to be more positive since it is based primarily on biased recollection of the original attribute values, which due to uncertainty, reflect a strong influence of the positive psychological anchor. Conversely, in forming their global judgments under a "no recall" condition, subjects are likely to rely not only on biasely recalled attribute values, but also on more accurate "spontaneous" evaluations, i.e. abstractions formed on the initial information, even when no specific instructions induced subjects to make a global judgment (Chattopadhyay and Alba, 1988). Therefore, in the "no recall" condition judgments are expected to be less affected by the psychological anchor.

In sum, Experiment 2 replicated the basic 2 (consistency) $\times$ 2 (delay) design of Experiment 1. This design was crossed with the Recall factor as described above. Finally, to provide a natural environmental setting and improve external validity of the results, Experiment 2 was conducted in consumers' homes.

3.1. Method

Subjects

One hundred and eighty-three male and female adults participated in the experiment in their homes. The subjects were recruited by two female experimenters who presented themselves as working for a market research firm conducting a survey on drug stores.

Design

The design was a $2 \times 2 \times 2$ between subjects design. Two factors were, as in Experiment 1, consistency and delay. The third factor was Recall – whether or not subjects were asked to recall the values of the store's attributes prior to judgment.

Procedure

Subjects in all conditions were first presented with a multi-attribute description of a drug store. The store was described on the same six

Table 1
Cell means and standard deviations of global judgments of the drug store in Experiment 2

	Attribute recall			
	Without attribute recall		With attribute recall	
	Low consistency	High consistency	Low consistency	High consistency
Delay	11.83	10.09	12.64	12.57
	(4.43) [a]	(4.22)	(3.65)	(3.96)
Immediate	9.26	10.64	10.26	11.34
	(4.28)	(2.34)	(4.29)	(2.90)

[a] Numbers in parantheses are standard deviations.

attributes as in Experiment 1. The rating on each attribute was allegedly derived from a recent survey.

The procedure was similar to the procedure in Experiment 1 except for changes due to the introduction of the recall factor. In the four "no-recall" conditions, subjects were asked to recall the original ratings on each of the six attributes *after* completing the judgment stage. In the four "recall" conditions subjects were asked to recall these attributes *before* making their judgments.

3.2. Results and discussion

Delay, consistency and judgment: Replication of Experiment 1

The cell means and standard deviations by recall, delay and consistency are given in Table 1, and the means by delay and consistency are plotted in Fig. 2. It is clear from Fig. 2 that the pattern of results in regard to these two factors is similar to the pattern observed in Experiment 1. The results of a three way ANOVA on the effect of delay, consistency and recall on judgment were also similar to the results obtained in Experiment 1 in regard to these two factors. First, no main effect was found for consistency ($F(1,175) = 0.1$, $p > 0.8$). Second, the analysis revealed a main effect for delay ($F(1,175) = 6.4$, $p < 0.01$) resulting from delayed judgments being higher than immediate judgments. Third, the analysis revealed an interaction between delay and consistency ($F(1,175) = 3.7$ $p < 0.06$). This interaction results from the fact that delayed judgments are higher than immediate judgments in the low consistency conditions (analysis of simple effects collapsing on the recall condition yielded $F(1,179) = 9.6$ $p < 0.002$), but not in the high consistency conditions ($F(1,179) = 0.2$ $p > 0.7$). This effect is consistent with the hypothesis that the effect of delay occurs primarily

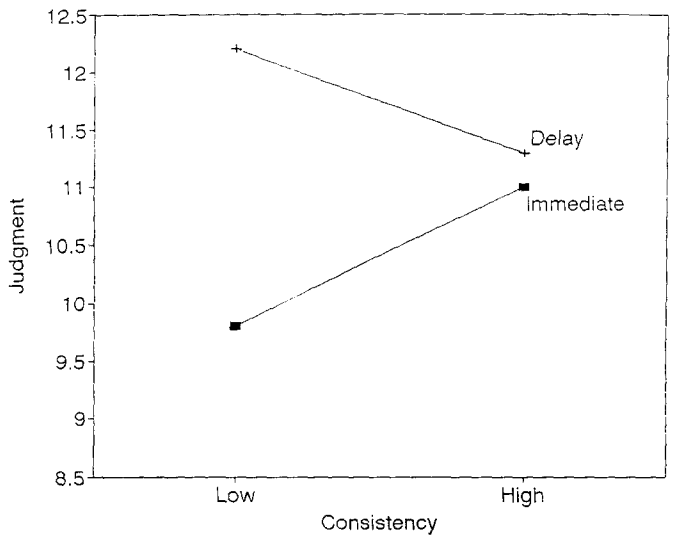

Fig. 2. Mean global judgment (collapsing over recall conditions) of the drug store in Experiment 2 as a function of delay and consistency.

when information is inconsistent. Note also that similar to Experiment 1, in the immediate conditions judgments tended to be higher in the low consistency condition, while in the delay conditions they were higher in the low consistency conditions. However, these effects were not significant ($F(1,179) = 2.4$ and $F(1,179) = 1.3$ respectively).

Recall and judgment

The three way ANOVA also revealed a main effect for attribute recall ($F(1,175) = 5.0$ $p < 0.03$) resulting from the fact that judgments are more positive when subjects are required to recall the factual information before making the judgment. As conceptualized above, the effect of attribute recall is due to a strong influence of the psychological anchor when memory decays and, therefore, to positively biased attribute recollection.

Next, we examined, within each condition, the proposition that judgments were positively biased as a function of decline in recall accuracy. To this end, we calculated for each subject a memory index (MEMIN). This index was defined as the negative value of the sum of the absolute differences between the actual and the recalled attribute values:

$$\mathrm{MEMIN}_{ij} = \sum_{i=1}^{6} \mathrm{ABS}(\mathrm{AV}_i - \mathrm{RV}_{ij}),$$

Table 2
Correlation between the memory index and global judgments in Experiment 2

	Attribute recall			
	Without attribute recall		With attribute recall	
	Low consistency	High consistency	Low consistency	High consistency
Delay	−0.13	−0.08	−0.36 *	−0.63 ***
Immediate	−0.31	−0.22	−0.53 **	−0.54 **

* $p < 0.1$, ** $p < 0.01$, *** $p < 0.001$.

where AV_i is the actual value of attribute i (the value in the stimuli), and RV_{ij} is the value of attribute i as recalled by subject j (this implies that the higher the memory index the better the recall).

The correlation between MEMIN and judgment for each of the 8 conditions is shown in Table 2. These correlations are substantially negative in the four recall conditions which suggests that the less memorable the attribute values, the more positive the judgment. On the other hand, in the no-recall conditions the relationship between the memory index and judgment is much weaker, probably because in these conditions judgments are based not only on the recalled attributes but also on the recollection of initial spontaneous evaluations.

Attribute recall

To examine biases in attribute recall we calculated for each subject the mean difference between the recalled attribute value and the true attribute values (the values that appeared in the stimuli). This mean was calculated for the three high attributes and the three low attributes separately, resulting in two measures for each subject. The Mean Deviation of High attributes (MDHA), and the Mean Deviation of Low attributes (MDLA) by condition are presented in Table 3.

It is clear from Table 3 that the mean MDHA is negative and the mean MDLA is positive. These results are consistent with the notion of regressive recall described earlier. However, there is an asymmetry in the mean deviation between high and low attributes. The positive deviation in the recall of low attributes is larger than the negative deviation in the recall of high attributes (the grand mean of MDLA + MDHA is significantly larger than zero, $t(182) = 4.4$, $p < 0.0001$). This asymmetry provides support to the contention that a moderately positive reference point leads to an overall positivity bias in attribute recall, i.e. the recalled attribute values are overall higher than their original values.

Table 3
Mean deviation of high attributes (MDHA) and low attributes (MDLA)

	Attribute recall							
	Without attribute recall				With attribute recall			
	Low consistency		High consistency		Low consistency		High consistency	
	MDHA	MDLA	MDHA	MDLA	MDHA	MDLA	MDHA	MDLA
Delay	−4.51	+6.54	+0.16	+1.45	−3.52	+7.58	+0.84	+2.39
	(3.55)	(3.29)	(3.83)	(3.03)	(2.95)	(3.26)	(2.47)	(2.82)
Immediate	−1.55	+1.77	−0.70	+0.70	−2.28	+2.71	−0.43	+0.81
	(2.56)	(2.50)	(1.53)	(1.53)	(2.55)	(3.04)	(o.78)	(1.11)

To examine whether this positivity bias depends on experimental condition, we subjected the sum of MDLA and MDHA to a 3 way analysis of variance with delay recall and consistency as dependent variables. The main effect for delay was highly significant ($F(1,179) = 14.1$, $p < 0.0002$), indicating that there is more positivity in attribute recall after delay. No other main effects nor the interaction effect were statistically significant. [3]

The main difference between temporal biases in judgment and temporal biases in attribute recall is that in attribute recall there is no significant interaction between consistency and judgment. This difference is consistent with the different processes associated with biases in judgment and with biases in attribute recall. With regard to judgment, we proposed two processes. First a negativity bias in immediate judgments caused by differential weighting of low vs. high attributes (and reflected in differences between the consistent and inconsistent immediate conditions). This process *is not mediated* by attribute recall. Second, a positivity bias in delayed judgments which *is mediated* by recalled attribute values which are "regressed" to the positive reference point (and reflected in the delay main effect).

This analysis suggests that by controlling for the positivity in attribute recall, no main effect of delay on judgment should be observed, but only an interaction between consistency and delay (resulting from the first process).

[3] In addition, comparison of each of the four "recall" conditions with the corresponding "no-recall" condition reveals that there was more positivity when attributes were recalled prior to judgment than when they were recalled after it. This pattern suggests that attribute recollection is influenced to some extent by prior (more negative) judgment. Although the effect of recall did not reach significance ($F(1,179) = 2.6$), it is interesting to note that the only significant (at $p < 0.05$ level) positivity bias in recall was obtained under the delay-recall conditions.

To this end, an ANCOVA was conducted with judgments as dependent variable, the positivity in recall (the sum of MDLA and MDHA) as a covariate and the remaining factors were as those included in the foregoing ANOVA. The results of the ANCOVA revealed two significant effects: A highly significant covariate effect ($p < 0.0001$) and a significant interaction between consistency and delay ($F(1,174) = 5.1$, $p < 0.05$). No other effects were significant. In particular, the highly significant main effect for delay, observed when attribute recall was not controlled, disappeared ($F < 1$). The adjusted means within the immediate conditions were similar in level to the original ones (10.4 and 11.7 for the low and high consistency, respectively), but the adjusted means within the delay condition were lower than the originals (11.4 and 10.8 for the two conditions, respectively). These results indicate that recall underlies the change that occurs in judgments over time.

4. General discussion

The two experiments suggest that differences in knowledge availability in the judgment formation stage result in differential functioning of the psychological anchor in the judgment process. When acquired knowledge is vivid in memory (i.e. immediate judgments) a contrast effect occurs between the moderately positive psychological anchor and the negative features of the information. This effect biases judgment in the negative direction. On the other hand, in delayed judgments, memory decay causes uncertainty in regard to attribute values. As a result, the recalled attribute values that serve as input to judgment are influenced not only by the original values, but also by the anchor. Since the anchor is moderately positive, judgments are less likely to be negatively biased, and may even be somewhat positively biased.

This proposition was found to be limited to delayed judgments that rely on recollection of the original information. The disappearance of the negativity bias occurs only when consumers base delayed judgments on factual details that are provided in the original information. When global judgments are made immediately after initial exposure to the information, no change in judgment valence is observed over time.

It is interesting to note another line of research that attempted to explain the improvement of judgments over time (see Matlin and Stang, 1978, for a comprehensive review). One explanation, entitled "selective

rehearsal" (e.g. Rundus, 1974) suggests that during the delay interval pleasant descriptions are rehearsed more than less pleasant descriptions, and as a consequence, a better recall of those pleasant descriptions biases judgments in the positive direction. Alternatively, Rychlak (1977) proposed a "logical learning theory". Rychlak contended that humans tautologize themselves with events, that is, they see themselves as identical with those events. Since individuals generally view themselves as good, they identify themselves with good items. These items are therefore more readily learned and retained. It should be noted that while these explanations provide interesting insights into the studied phenomena, they cannot provide an alternative explanation to the one proposed in the present study given that some of the results cannot be inferred by them. Perhaps more importantly, they lack a theoretical cognitive account of the mechanisms that underlie judgments under the studied conditions.

One important theoretical implication of the present study concerns temporal changes in judgments and their application to the sleeper effect (Hannah and Sternthal, 1984; Mazursky and Schul, 1988). According to this paradigm, knowledge originating from a discounting message is detached from knowledge that advocates the purchase of a product and is forgotten over time, thus resulting in temporal improvement of product related knowledge. Given that a supportive claim is typically positive while a discounting message is negative, an alternative explanation may suggest that improvement in judgments is a result of the signs of the different types of the conveyed information. To rule out such an explanation a possible extension of the paradigm should include conditions that have value signs that are opposite to those investigated to date (i.e. a negative message and a positive correction) to be compared with results using the traditional stimuli.

From a pragmatic perspective, the study implications may be less relevant if all the attributes presented via advertising and in-store selling activities, are consistently positive and advocate the purchase of the product. However, many purchase decisions are also affected by consumer surveys, reports, expert judgment and alike.

Accordingly, an important implication of the study concerns judgment formation following exposure to independent reports about the companies' brands performance (e.g. consumer reports). In such reports the information does not necessarily support the brands as in many company sponsored advertisements. The conclusions of the present study suggest specific implications with regard to the processes and nature of the judgments

under the conditions specified in the study: Primarily, that one should not be overly concerned about overweighting of negative information. This overweighting may frequently disappear over time and a positivity bias will occur.

However, the findings obtained in the present study may apply also to situations in which inconsistency in the information is planned as part of a company's strategy and not generated by external reports. Specifically, various strategies have been employed by companies to overcome the problem of decline in the effectiveness of marketing communications. One strategy involves the presentation of brands in a more "balanced" (two sided) form. Sales representatives may attempt to appear as "consultants" who generally advocate the purchase of their brand(s) but may, under certain circumstances, express some reservations about them. Alternatively, companies may attempt, via public relations activity, to influence reporters to publish articles that mention some aspects of the company's activities even though some of the published characteristics may not necessarily be supportive of the product or company. The present study suggests that exposing consumers to negative information, which is associated with negativity bias in consumer judgment, need not necessarily have consequences that are as severe in the long run as originally anticipated.

An interesting extension of the present framework may be obtained by testing it among consumers who differ in their level of involvement. Although involvement level was not directly manipulated in the present study, the presented stimuli may not have stimulated subjects to diligently consider all the available information and to exert the cognitive effort that characterizes high involvement judgments and decisions. The outcome judgments under high involvement may be different although not all the possible differences are expected to deviate in the same direction. For example, memory decay may not be as rapid as in low involvement because of deeper processing and thus, the extent of positive change in judgments over time may be more moderate.

Acknowledgements

The authors acknowledge the support of the K-Mart foundation and the Davidson Centre for Agribusiness.

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