Evaluative inference in social cognition: The roles of direct versus indirect evaluation and positive- negative asymmetry

GUIDO PEETERS

N.F.W.O. and K.U. Leuven, Belgium

Abstract

Various implications regarding evaluative inference in social cognition are derived from (a) a relativistic evaluative-meaning concept dealing with evaluation as an interaction between descriptive attributes associated with the perceived object on the one side and evaluative standards belonging to the perceiver on the other side, and (b) a concept of evaluative positive-negative asymmetry that completes and integrates more simple concepts regarding the halo effect, negativity effect, and positivity bias. In subsequent sections empirical support for those implications is provided from (a) a review of previous research on impression formation, and (b) two new experiments in which effects associated with positivity bias, negativity effect, halo effect and the supplements implied by the positive-negative asymmetry concept were isolated from each other using a multifactorial ANOVA design. The results showed strong halo effects and positivity biases. Room for negativity effects was left only under very specific conditions which, however, were consistent with the positive-negative asymmetry concept.

INTRODUCTION

Inferential processes are assumed to play a substantial role in social cognition. Presumably they are attuned to produce representations of the environmental world that are functional to the individual's adaptation. This implies that they should lead to a clear discrimination between 'objects to be approached' and 'objects to be avoided'. This discrimination may be reflected in the positive versus negative evaluations of the objects transpiring into the 'evaluative meanings' of the verbal terms used to designate these objects and their attributes. The specific inferences involved in this process of evaluative discrimination are called 'evaluative inferences'. In this paper we shall examine implications for evaluative inference that follow from (a) the distinction between direct and indirect evaluation implied by a relativistic

Address for correspondence: K. U. Leuven, Laboratorium voor Experimentele Sociale Psychologie, Tiensesstraat 102, B-3000 Leuven, Belgium.

concept of evaluative meaning developed in Peeters (1979, 1986), and (b) the affective stimulus effects and response biases involved in the positive-negative asymmetry (Kanouse and Hanson, 1971; Peeters, 1971, 1988).

INFERENCE-TYPES FOLLOWING FROM A RELATIVISTIC EVALUATIVE-MEANING CONCEPT

The relativistic evaluative-meaning concept proceeds from the distinction between 'evaluative' and 'descriptive' meaning. The descriptive meaning of a term refers to those aspects of the term's referent that are treated as independent of a perceiver's perceptual-judgmental activity. For instance, in 'warm coffee' the term 'warm' refers descriptively to temperature as an objective parameter of the coffee which is assumed to exist independent of the perceptual act by which it is assessed. The evaluative meaning of a term reflects a subject's evaluative response to the referent of the term. Whether this response is positive or negative may not only depend on the objective properties of the referent, which are represented by descriptive meanings, but also on an 'evaluative standard' held by the subject. For instance, in 'warm coffee' the adjective 'warm' may endorse a positive evaluative meaning insofar as 'warm' is implied by the subject's evaluative standard that defines 'good coffee'. The present evaluative-meaning concept is 'relativistic' in that it does not deal with evaluative meaning as a primary psychological category but as a derived category relative to object-bound descriptive attributes and subject-bound evaluative standards.

The contrast between the 'objective' nature of 'descriptive' and 'subjective' nature of 'evaluative' meanings is in principle an arbitrary matter. The descriptive attribute 'warmth' can be related to subjective sensorial activity and even 'temperature' can be dealt with as a mental construct established by physicists. Conversely, the 'goodness' of an object may appear phenomenologically as an objective property on a par with descriptive properties such as warmth. The only reason for advancing the present 'relativistic' theory was that it provided the most economical explanation for a series of bewildering outcomes of research reported in the literature. Hence, it was conceived as an 'as-if' theory which did not pretend to describe the phenomenology of evaluative meaning but rather provides a hypothetical construction concerning underlying processes that could account for some intriguing aspects of this phenomenology (*cf.* Peeters, 1979, 1986).

One implication of the relativistic evaluative-meaning concept was the distinction between *direct* and *indirect* evaluative meaning. In order to explain it, we return to the example of the 'warm coffee'. The positive evaluative meaning of 'warm' is called *indirect* in that it follows from the agreement between the descriptive meaning of 'warm' (i.e. 'high temperature') on the one hand, and a subjective evaluative standard about the temperature of coffee, on the other hand. For the exceptional individual who prefers cold coffee, the indirect evaluative meaning of 'warm' in 'warm coffee' may be negative. Thus an indirect evaluative meaning is endorsed by descriptive terms and reflects the (dis)agreement between the descriptive meaning-content of the terms and a subjective evaluative standard which represents an ideal state of affairs concerning the term's referent. However, this rationale does not apply to the evaluative meaning of 'good' in 'good coffee'. The evaluative meaning of

'good' is always positive, irrespective of the subject's evaluative standard. The lover of warm coffee calls warm coffee 'good' while the lover of cold coffee applies the same adjective 'good' to cold coffee. They hold opposite evaluative standards regarding coffee, but they use the term 'good' to describe the object that is in agreement with their own evaluative standard. The evaluative meanings of terms such as 'good, bad, favourable, unfavourable, etc.' which express directly the agreement or disagreement with an evaluative standard are called *direct* evaluative meanings.

In evaluative inference, the stimulus information — from which inferences were made — as well as the response information — which is inferred — can be either direct or indirect evaluative. It follows that there are four main inference-types which correspond to the four main fields of schema 1: *Type 1: from indirect evaluative stimulus information to indirect evaluative response information (cells 1 of schema 1)*. For instance, given the stimulus information that a fungus contains proteins, a fungus eater infers that it contains also vitamins.

Type 2: from indirect evaluative stimulus information to direct evaluative response information (cells 2 of schema 1). For instance, given the stimulus information that a fungus contains proteins, a fungus eater infers that it is a 'good' fungus.

Type 3: from direct evaluative stimulus information to indirect evaluative response information (cells 3 of schema 1). For instance, given the stimulus information that a fungus is 'good', a fungus eater infers that it contains vitamins.

Type 4: from direct evaluative stimulus information to direct evaluative response information (cells 4 of schema 1). This type will be disregarded because it is trivial. Indeed, telling that an object is 'good' is about the same as telling that it is 'positive' or 'favourable'. Type 4 makes sense only if the underlying evaluative standard varies. For instance, considering that beautifully coloured fungi are toadstools, a fungus evaluated as 'good for pictures' may be evaluated as 'bad for consumption'. However, this complication will not be dealt with in the present paper, where only cases with a constant evaluative standard are considered.

Within each type one can distinguish between four classes of inferences marked in schema 1 by the letters a,b,c, and d. They are: (a) from positive stimulus to positive response, (b) from positive stimulus to negative response, (c) from negative stimulus to positive response, and (d) from negative stimulus to negative response. The examples given above all belonged to class 'a' (from positive to positive). Thus schema 1 shows 16 possible inferences. Disregarding type 4 for the reasons given above, we are left with the 12 inferences listed below. Each inference is illustrated by an example of a fungus which is looked at from the perspective of a consumer of mushrooms.

- (1a) From indirect positive to indirect positive. E.g. 'This fungus contains proteins, therefore it contains vitamins'.
- (1b) From indirect positive to indirect negative. E.g. 'This fungus contains proteins, therefore it is leathery'.
- (1c) From indirect negative to indirect positive. E.g. 'This fungus contains poison, therefore it contains vitamins'.
- (1d) From indirect negative to indirect negative. E.g. 'This fungus contains poison, therefore it is leathery'.
- (2a) From indirect positive to direct positive. E.g. 'This fungus contains proteins, therefore it is a good one'.

		Response Information (Inference)			
		Indirect		Direct	
		Evaluative		Evaluative	
		POSITIVE	NEGATIVE	POSITIVE	NEGATIVE
		(vitamins)	(leathery)	(good)	(bad)
Stimulus Information	Indirect	+HALO		+HALO	
	POSITIVE (protein)	PNA	1a 1b	PNA	2a 2b
	Evaluative		1c 1d		2c 2d
	NEGATIVE (poison)		-HALO		-HALO
	Direct	+HALO			
	POSITIVE (good)	PNA	3a 3b	4a 4b	
	Evaluative		3c 3d	4c 4d	
	NEGATIVE (bad)	PNA	-HALO		

Schema 1. Inferences predicted by the positive and negative halo effects and by the positive-negative asymmetry (PNA)

- (2b) From indirect positive to direct negative. E.g. 'This fungus contains proteins, therefore it is a bad one'.
- (2c) From indirect negative to direct positive. E.g. 'This fungus contains poison, therefore it is a good one'.
- (2d) From indirect negative to direct negative. E.g. 'This fungus contains poison, therefore it is a bad one'.
- (3a) From direct positive to indirect positive. E.g. 'This fungus is good, therefore it contains vitamins'.
- (3b) From direct positive to indirect negative. E.g. 'This fungus is good, therefore it is leathery'.
- (3c) From direct negative to indirect positive. E.g. 'This fungus is bad, therefore it contains vitamins'.
- (3d) From direct negative to indirect negative. E.g. 'This fungus is bad, therefore it is leathery'.

Not all of these inferences are equally plausible. In the subsequent section we examine how the plausibility of inferences may be affected by stimulus effects and response biases.

HALO EFFECTS AND POSITIVE-NEGATIVE ASYMMETRY (PNA) IN EVALUATIVE INFERENCE

It may be evident that inferential processes are, at least partly, controlled by the eliciting stimuli. As to evaluative inferences, the most straightforward of those *stimulus effects* may be the *halo effect* whereby positive stimuli elicit positive inferences (positive halo effect) and negative stimuli elicit negative inferences (negative halo effect). Kanouse and Hanson (1971) observed that when both halo effects enter in competition, then the negative outweighs the positive halo effect. This phenomenon has been referred to as *negativity effect* (later referred to as 'affective negativity effect' – cf. Czapinski, 1988; Peeters and Czapinski, 1990).

In addition to the eliciting stimuli, inferential processes seem to be controlled by purely subjective response biases. In the case of evaluative inferences, there is ample evidence, reviewed by Matlin and Stang (1978), suggesting the occurrence of a *positivity bias* (leniency effect, pollyanna phenomenon) which implies that subjects have an *a priori* disposition to make positive rather than negative inferences.

At first glance the positivity bias may appear incompatible with the negativity effect. However, this is only the case if positivity bias and negativity effect are conceived of as simple straightforward principles, the one representing an unconditional propensity for positive evaluations, the other an unconditional tendency to overweight evaluatively negative cues in the formation of evaluations. In Peeters (1971) it was shown that positivity bias and negativity effect (then called 'overemphasis of the negative') are not unconditional but form the complementary sides of a more complex positive-negative asymmetry (PNA) of psychological functioning which has survival value for the subject. Living in a world that has a much larger potential for negative than for positive life outcomes, the subject can be compared with a fungus eater who has to survive in an environment in which mushrooms are scarce and overwhelmed by toadstools. The positivity bias is functional in order to approach the mushrooms, novel fungi being dealt with as if proceeding from the hypothesis that they may be mushrooms. The negativity effect is functional to avoid the toadstools in that the initial positive hypothesis is vehemently rejected at the slightest counter evidence. This rejection is associated with 'avoidance' as a coping strategy. It follows that the given negativity effect occurs only if the underlying evaluative dimension reflects an approach-avoidance dimension: positively evaluated objects should be perceived as 'approachable', negatively evaluated ones as 'to be avoided' (Peeters and Czapinski, 1990). If this condition is fulfilled, the PNA-concept predicts a predominance of positive inferences, not only if the stimulus information is positive but also if it is irrelevant with respect to the inferred contents. Indeed, in the latter case room is left for the formation of positive hypotheses about reality. Negative inferences, then, would only be drawn from descriptively relevant negative stimuli and not reach further than would be strictly necessary in order to circumscribe the bad consequences of the negative stimuli. This view is in agreement with Kanouse and Hanson's (1971) interference theory which states that a negativity effect may only be produced to the extent that the negative interferes with the positive, which is usually the case when positive and negative stimuli are inseparable attributes of the same object.

Schema 1 shows by which of the two principles — halo effect and/or PNA — each of the 12 inferences is predicted. 'HALO' is preceded by a + or – sign, indicating

respectively whether the positive or negative halo effect is concerned. Absence of a principle in a cell indicates that the corresponding inference is inconsistent with the absent principle. Thus 'PNA' in cell 1c indicates that inference 1c is consistent with the PNA-concept, while the absence of 'HALO' in the same cell, indicates that it is inconsistent with the halo effect.

The predictions based on the halo effect (occurrence of inferences a and d, absence of inferences b and c) are self-evident and need no further comment. The same holds for the positive inferences predicted by the PNA-principle if the stimulus information is positive, in which case the positivity bias implied by the PNA-principle is in agreement with the positive halo effect (inferences 1a, 2a, 3a). Less self-evident may be PNA contradicting the negative halo effect by predicting inferences 1c and 3c rather than 1d and 3d. These nonobvious predictions follow from the PNA-principle implying that positive inferences are not only made if the stimulus information is positive, but as well if it is irrelevant with respect to the inferred contents. The fact that a given fungus contains poison may be uninformative about its vitamin content or leathery taste. Hence, there is room for a positivity bias making subjects to comply with inference 1c, expecting that the fungus may contain vitamins, while not with inference 1d, expecting no leathery taste. The case of inferences 3c and 3d is a little more complicated in that the stimulus information is not completely uninformative. The direct evaluative stimulus information 'This fungus is bad' implies the presence of at least one negative attribute of the indirect evaluative type. For instance, the fungus can lack vitamins, be leathery, poisonous, etc. The PNA-principle implies that only one of these negative attributes may suffice to spoil the whole fungus (negativity effect). Hence, while the subject knows that there must be some negative attribute(s), information about specific attributes is lacking. Hence, when the subject has to decide about the presumed presence or absence of each attribute separately, positive attributes may be stressed as present (inference 3c) while negative ones as absent (inference 3d). Finally, the PNA-principle is only in agreement with the negative halo effect when direct evaluative inferences are drawn from indirect negative stimulus information (2c and 2d). Indeed, because of the negativity effect one single negative attribute such as 'poisonous' may suffice to make the whole fungus 'bad'.

So far, we considered the implications of two theoretical principles because we expected them to be valid. One might wonder, however, whether the inferences derived from the PNA-concept, could not also be derived from more simple principles such as a simple positivity bias and a simple negativity effect. 'Positivity bias' was earlier defined as a response bias making subjects respond positively irrespective of the nature of the stimulus information. This bias would lead to positive inferences in all possible cases. Schema 1 shows that in most cases the inferences predicted by the positive-negative asymmetry (PNA) are indeed positive as would be predicted by a simple positivity bias. This is not surprising, positivity bias being a basic process underlying the positive-negative asymmetry. Nevertheless, there is one exception where a straightforward application of a positivity bias disagrees with the PNA-concept. This exception concerns the inference of direct evaluative response information from negative indirect evaluative stimulus information (inferences 2c and 2d) where the positive-negative asymmetry (PNA) predicts a negative response (inference 2d) while a simple positivity bias would produce, of course, a positive response (inference 2c).

Beside a simple positivity bias, a simple negativity effect may also be considered. It would imply that negative stimulus information is always weighted more than positive stimulus information. This would result in a predominance of the negative halo effect (-HALO). Schema 1 shows that in two out of three cases, the predictions from the negative halo effect (-HALO) disagree with those from the PNA-concept. Agreement is only observed for direct evaluative inferences from negative indirect evaluative stimuli (inferences 2c and 2d).

Altogether, the predictions about plausible inferences based on the PNA-concept can be summarized as a positivity bias which is always present except in one case where the PNA-concept allows for a negativity effect: the inference of direct evaluative response information from indirect negative stimulus information.

EMPIRICAL EVIDENCE FROM PERSON PERCEPTION RESEARCH

Many studies on person perception deal with one of the inference types 1,2, or 3 discussed above. A review of these studies provides a preliminary test of the predictions based on the halo effect and the positive-negative asymmetry that are presented in schema 1. In the subsequent paragraphs some representative research relating to each type is discussed.

Type 1: From indirect to indirect evaluation

It is predicted in schema 1 that inferences from positive stimuli should be unambiguously positive, both the halo effect and the positive-negative asymmetry converging towards positive inferences of class 1d. Inferences from negative stimuli, however, should not be unequivocally negative but might be heterogeneous, the positive-negative asymmetry predicting positive inferences (1c), the halo effect negative ones (1d). A test of these predictions could be looked for in the numerous studies on 'impression formation' where subjects were required to infer additional personality traits of a stimulus person from one or more traits provided by the experimenter. Unfortunately, the results obtained in most of these studies are inconclusive because the possible evaluative inferences we are interested in are confounded with possible descriptive inferences. For instance, if a subject infers the presence of vitamins from the presence of proteins, then this inference might be the manifestation of a halo effect based on the positive evaluation of both vitamins and proteins, but it could equally well be the manifestation of purely descriptive beliefs such as the assumption that the presence of proteins implies the presence of vitamins for biochemical reasons. In order to make the studies conclusive, evaluative and descriptive inferences should be disentangled. This was done in an experiment by Lewicka (1979). Using a method established by Peabody (1967), she isolated evaluative from descriptive inferences in an impression-formation task. The results showed a predominance of evaluative inferences which, consistent with the PNA-prediction, were positively biased showing no negativity effect. However, negative stimulus traits were found to facilitate descriptive inferences which constituted a different type of negativity effect than the affective-evaluative one dealt with in the present paper. It has been discussed elsewhere as *informational negativity effect* (Czapinski, 1988; Peeters and Czapinski, 1990).

Type 3: From direct to indirect evaluation

Type 3 is dealt with immediately after type 1 because, as is apparent from schema 1, the same pattern of predictions is associated with it. Indeed, given a positive direct evaluative stimulus, such as the qualification 'good', both the halo effect and the PNA-concept converge towards the positive inference 3a. However, if the stimulus is negative (bad), the halo effect predicts a negative inference (3d), the PNA-concept a positive one (3c). Hence, the inferences from the negative stimulus are evaluatively more ambiguous than those from the positive stimulus. Empirical evidence may be found in a study by Alimaras (1967) who asked subjects in one condition to describe a real person they liked, and those in another condition a real person they disliked. Consistent with the present predictions, the descriptions of the liked person involved predominantly positive traits, while those of the disliked person showed a mixture of positive and negative traits. Analogous results were reported by Czapinski and Lewicka (1979).

Type 2: From indirect to direct evaluation

Schema 1 shows that the prediction pattern relative to inferences of type 2 differs from the patterns relative to types 1 and 3 in only one respect: the negative ambiguity associated with the negative stimulus has disappeared, the positive-negative asymmetry making the same prediction as the negative halo effect (inference 2d). This convergence is in agreement with numerous studies reviewed by Kanouse and Hanson (1971) showing that negative 2d inferences are even more extreme than positive 2a inferences, indirect negative stimuli carrying greater weight than positive ones in the formation of a direct evaluative 'overall evaluation'.

NEW EXPERIMENTAL EVIDENCE

Problem and design

The research literature on person perception seems to provide support for the halo effect and the PNA-concept. However, this support is weakened by the fact that it is based on selective *a posteriori* analyses. In addition, each analysis focused on only one inference type of the three available. For that reason, two experiments were run in which inference types were directly compared within the same experiment. Moreover, the rather complex PNA-concept was tested in competition with more simple inferential principles, namely the halo effect, the simple negativity effect and the simple positivity bias.

In both experiments subjects were asked to rate the plausibility of evaluative inferences belonging to various cells of schema 1. However, not all 16 cells were used. Inferences of types 1 and 4 were omitted because, as previously explained, the former could be confounded with non-evaluative 'descriptive' inferences while the latter seemed trivial. In this way, only the eight cells with inferences of types 2 and 3 were left. They constituted a $2 \times 2 \times 2$ design which involved the following factors: (a) *Type of inference* (T) where the levels were: Type 2 (from indirect to direct evaluation), and Type 3 (from direct to indirect evaluation). (b) *Stimulus valence* (S) where

the levels were: *positive* (+) and *negative* (-). (c) *Response valence* (R) or valence of the inference where the levels were: *positive* (+) and *negative* (-).

This design is summarized in the upper part of Table 1, where the corresponding cells of schema 1 are also indicated in the row 'Cells schema 1'.

Predictions

Plausibilities of the various inferences or types 2 and 3 derived from schema 1, are displayed in the middle part of Table 1 under the heading 'Predictions schema 1'. The symbols 'H' and 'L' indicate respectively 'high' and 'low' plausibility while 'M' a 'medium degree' of plausibility.

Table 1. Experiments 1 and 2: Design, predictions and results

Factors								
Type of inference (T)	2	2	2	2	3	3	3	3
Stimulus valence (S)	+	+	-	-	+	+	-	-
Response valence (R)	+	-	+	-	+	-	+	-
Cells schema 1	2a	2b	2c	2d	3a	3b	3c	3d
Predictions schema 1								
HALO	H	L	L	H	H	L	L	H
PNA	H	L	L	H	H	L	H	L
HALO/PNA combined	H	L	L	H	H	L	M	M
Alternative predictions								
Simple pos. bias	H	L	H	L	H	L	H	L
Simple neg. effect	M	M	L	H	M	M	L	H
Results Exp. 1								
Overall	13.0	6.7	7.2	11.2	12.7	7.0	8.0	10.8
Rep. 3 only	10.4	7.6	10.3	8.2	10.9	8.9	9.4	9.9
Results Exp. 2								
Overall	13.2	6.2	6.9	11.2	12.9	6.3	8.15	10.9
Rep. 3 only	11.9	6.4	10.3	7.8	11.78	8.3	8.6	9.4

The pattern of H's and L's in Table 1 shows that the halo effect (HALO) predicts an interaction between stimulus valence (S) and response valence (R). The predictions associated with the positive-negative asymmetry (PNA) differ from those of the halo effect only in that the plausibilities of inferences 3c and 3d are reversed. These reversals would result in a third-order interaction between type of inference (T), stimulus valence (S) and response valence (R), and this interaction should be preserved if the effects of HALO and PNA are combined, the plausibility of the inferences 3c and 3d becoming medium as compared with the plausibilities of the other inferences where the effects of HALO and PNA do not contradict but reinforce each other.

Alternative predictions straightforwardly derived from the concepts of 'simple positivity bias' and 'simple negativity effect' are also presented in Table 1.

The pattern of H's and L's associated with a simple positivity bias shows a main effect of response valence (R), positive responses always being expected to be more plausible than negative responses. The simple negativity effect makes basically the same predictions as the halo effect. However, since positive stimuli carry less weight

than negative stimuli, plausibilities of inferences from positive stimuli should be less extreme, or 'medium', as compared with inferences from negative stimuli. This would result in an interaction between stimulus valence (S) and response valence (R) which would differ from the $S \times R$ interaction predicted by the halo effect in that the plausibility of inferences marked 'M' should be intermediate as compared to that of inferences marked 'L' and 'H'.

Finally, we should keep in mind that a primary aim of the present study was to test the validity of the PNA-concept. In this respect it is worth noting that only this concept predicts the specific third-order interaction involving the factor 'type of inference', and that this interaction should be preserved if the effects of the positive-negative asymmetry are combined with effects of the other theoretical principles mentioned, all of which predict effects of a lower order.

Experiment 1

Subjects

Twenty male and female sophomores of a higher music-educational programme (Lemmensinstituut, Leuven) answered an anonymous questionnaire during a course on psychology of music taught by the author.

Questionnaire

The 3-factor design displayed in Table 1 was realized by a basic questionnaire with eight items, one for each cell of the design. Actually three such questionnaires were constructed. They formed three parallel replications of the experiment. The items of the three replications were mixed together in a random way and presented in four different orders which varied between subjects. In this way, two new factors were added to the original 3-factor design: (a) replications (three levels within subjects) and (b) order of presentation (four levels between subjects).

Each item required the subject to rate the plausibility of an inference. Each inference was formulated by a short affirmative sentence containing the stimulus information, followed by a short interrogative sentence containing the response information. Below are shown the eight inferences of replication 1. The symbols 2a...3d refer to the cells of the design (Schema 1 and Table 1):

- 2a: X is GENEROUS. Would you LIKE X?
- 2b: X is GENEROUS. Would you DISLIKE X?
- 2c: X is SELFISH. Would you LIKE X?
- 2d: X is SELFISH. Would you DISLIKE X?
- 3a: You LIKE X. Would X be GENEROUS?
- 3b: You LIKE X. Would X be SELFISH?
- 3c: You DISLIKE X. Would X be GENEROUS?
- 3d: You DISLIKE X. Would X be SELFISH?

The stimulus and response information used in replications 2 and 3 are displayed, together with those of replication 1, in schema 2. Thus in order to obtain the inferences of replication 2 one should simply replace 'GENEROUS' with 'RELIABLE', 'SELFISH' with 'UNRELIABLE', etc.

	Indirect evaluative		Direct evaluative	
	+	-	+	-
Repl. 1	GENEROUS	SELFISH	you LIKE X	you DISLIKE X
Repl. 2	RELIABLE	UNRELIABLE	X is a GOOD COWORKER	X is BAD COWORKER
Repl. 3	MUSICAL	UNMUSICAL	you LIKE X	you DISLIKE X

Schema 2. Indirect and direct evaluative terms in replications 1, 2, and 3 within experiments 1 and 2

As the theory presupposed approach-avoidance related evaluations, the traits generous-selfish and reliable-unreliable were selected because they are representative of an approach-avoidance related evaluative dimension previously established (namely 'other-profitability' — Peeters, 1979, 1986; Peeters and Czapinski, 1990). 'Musicality' might not belong to this dimension but was nevertheless assumed to be associated with approachability because the subjects were musicians. The specification 'coworker' was used to put the good-bad evaluation in a perspective of interpersonal interaction where approachability would be at stake. The Dutch equivalent of *(dis)like* — (on) sympathiek vinden — was considered to be a typical direct evaluative term relating to the approachability of people.

The subjects answered each item by marking a number on a 19-point likelihood scale ranging from -9 (nearly impossible) to +9 (nearly certain). Zero was the midpoint of the scale, +1 was defined as 'more likely than unlikely' while -1 as 'more unlikely than likely'. The greater the likelihood expressed by a subject with respect to an inference, the greater the plausibility that could be accorded to that inference. The subjects were instructed that items were unrelated to each other, X representing a different person in each item.

Results and discussion

The main prediction was that the positive-negative asymmetry would result in a third-order interaction (RST) which, eventually combined with a halo effect, would produce a specific pattern of high, low and medium plausibilities (*cf.* Table 1: HALO/PNA combined). Relevant data are presented in Table 1: 'Exp. 1 overall'. In order to eliminate negative signs, the original scale values were increased by 10, making them range from 1 to 19 with 10 as middle-point. The table presents the average plausibility of each inference over subjects and replications ($N=60$).

The obtained pattern of plausibilities is fairly consistent with the one predicted by the halo-effect combined with the positive-negative asymmetry. Indeed, the plausibility scores marked H in the HALO/PNA predictions are effectively higher than those marked M, while the latter are higher than those marked L. Unfortunately, the corresponding interaction (RST) is not significant ($F(1,16)=1.94, p<0.19$). However, there is a significant underlying fourth-order effect implying that the predicted interaction RST holds in replications 1 and 2, but not in replication 3 ($F(2,32)=4.44, p<0.02$). When replication 3 was discarded from the analysis, the critical RST-interaction was nearly significant ($F(1,16)=4.31, p<0.055$). Average plausibility ratings from the deviant replication are presented in Table 1: 'Exp. 1, Rep. 3 only'. In this replication the subjects judged the plausibilities of inferences between 'like

versus dislike' and 'musical versus unmusical'. The data show in the first place that the plausibility ratings from replication 3 are nearer to the neutral midpoint of the scale (10) than the averages over replications. This could mean that our subjects, despite being musicians, accorded little weight to musicality in evaluating people. However, although they are less extreme, the plausibility ratings from replication 3 show clear differences which are consistent with the pattern of predicted plausibilities, except for the inferences corresponding to cells 2c and 2d, where a positivity bias seems to be substituted for the expected negative halo effect. The inferences in question concern direct evaluations on the basis of the indirect negative stimulus trait 'unmusical'. Apparently the subjects did not assume 'unmusical' to be a sufficient reason to dislike a person, as they did with 'selfish'. A possible explanation may be that, being musicians themselves, they attempted to manage a favourable impression about the professional group to which they belonged by suggesting that musicians are not so narrow-minded that they could not like a person who does not share their musical interests. Another explanation may be that 'unmusical' is not an appropriate stimulus to induce negative halo effects. Further research to clarify this matter will be presented in Experiment 2.

Further examination of the data shows that the pattern predicted by the positive-negative asymmetry in isolation (*cf.* Table 1: PNA) does not stand out in the data. Indeed, in cells 3c and 3d, the obtained plausibilities are opposite to the predicted ones, but they are in agreement with the halo effect. Actually, the second order interaction ($R \times S$) predicted by the halo effect turned out to be very significant ($F(1,16) = 82.56, p < 0.0001$). Apparently, the positive-negative asymmetry was partly, but not completely, outrivalled by the halo effect: in cases where the positive-negative asymmetry made opposite predictions, the halo effect was not abolished but only somewhat attenuated.

The results from replication 3, which were deviant with respect to the positive-negative asymmetry, were also deviant with respect to the halo effect. Indeed, the $R \times S$ interaction which was related to the halo effect was qualified by a significant interaction with 'replications' ($F(1,32) = 35.59, p < 0.0001$), the halo effect being largely outrivalled by a positivity bias in replication 3.

As a possible alternative to the relatively complex positive-negative asymmetry concept, two so-called 'simple' concepts were considered: simple positivity bias and simple negativity effect.

Simple positivity bias predicted a main effect of response valence (R) which was obtained ($F(1,16) = 29.60, p < 0.0002$). It was qualified by several significant but irrelevant interactions which did not detract from it and hence are disregarded. Ultimately, positivity bias was only detracted from by the halo effect presented by the $R \times S$ interaction discussed already. Indeed, the halo effect implied that positive responses were no longer rated more plausible than negative ones if the stimuli were negative. However, despite the fact that half the stimuli were negative, and the other half positive, the positive responses were still on average rated significantly more plausible than the negative ones, which suggests that the effect of a simple positivity bias was added to that of the halo effect. One implication is that the negative halo effect stood out less saliently than the positive halo effect, as is shown by the data in Table 1, and this outcome is opposite to the predictions associated with the simple negativity effect according to which the negative halo effect should always be stronger than a positive halo effect, negative stimuli carrying greater weight than positive ones.

Finally, for the sake of completeness, we should mention a significant main effect of 'replications' ($F(2,32) = 5.54$, $p < 0.01$) which, however, will be disregarded as irrelevant.

Altogether, the data seem highly consistent with one stimulus effect, being the halo effect, and one response bias, being the simple positivity bias. One other stimulus effect, namely the simple negativity effect, seems strongly disconfirmed. The disconfirmation of the simple negativity effect together with the confirmation of the simple positivity bias may be in line with the PNA-concept which, proceeding from a simple positivity bias as a basic dynamic, restricts the negativity effect to very specific conditions. However, the PNA-concept was not fully confirmed in that the predicted $R \times S \times T$ interaction seemed present in the data, but statistical significance was questionable. Hence, it was decided to run experiment 2 before drawing definite conclusions.

Experiment 2

This experiment was an almost exact replication of Experiment 1. The main difference was that subjects were not musicians but 36 male and female psychology freshmen from the University of Leuven who completed the questionnaire anonymously during a collective session.

The results were largely consistent with those from Experiment 1. As shown in Table 1 (exp. 2: Overall), the pattern of plausibilities was in perfect agreement with the pattern obtained in Experiment 1. Moreover, this time the critical $R \times S \times T$ interaction was significant ($F(1,32) = 6.33$, $p < 0.02$), which means that the positive-negative asymmetry may be accepted as a valid principle underlying evaluative inferences. However, again as in Experiment 1, the $R \times S \times T$ interaction was qualified by a significant interaction with 'replications' ($F(2,64) = 4.16$, $p < 0.03$), which was due once more to deviant outcomes in replication 3. As shown in Table 1, the data from replication 3 deviated from the overall data in exactly the same way as they did in Experiment 1. This means that the deviant outcome cannot be interpreted as an irrelevant idiosyncratic reaction of musicians. Psychology freshmen also failed to show the expected negative halo effect with respect to 'unmusical' and replicated the positivity bias displayed by the musicians. Apparently 'unmusical' is not an appropriate stimulus to induce negative halo effects.

Further, the data showed the same strong halo effect as in Experiment 1 ($F(1,32) = 186.67$, $p < 0.0001$) and again this halo effect was partly outrivalled by a positivity bias in replication 3, resulting in an interaction with 'replications' ($F(2,64) = 45.82$, $p < 0.0001$). Also the main effect related to a simple positivity bias was replicated ($F(1,32) = 43.69$, $p < 0.0001$) and again it was qualified by several irrelevant interactions which were not always the same as in Experiment 1 and did not detract from the positivity bias, for which reason they will not be considered further.

Finally, as shown in Table 1, the simple negativity effect was contradicted again in that the positive halo effect stood out more saliently than the negative halo effect.

For the sake of completeness, we may add that the irrelevant main effect of 'replications' observed in Experiment 1 did not show up among the significant effects of Experiment 2. Instead three other irrelevant effects were observed that will not be discussed.

GENERAL DISCUSSION AND CONCLUSION

The present experiments were designed in order to establish whether the rather complex PNA-principle was required in order to account for evaluative inferences given that more simple principles such as the halo effect, simple positivity bias and simple negativity effect were available. The results confirmed the validity of each of those principles except the simple negativity effect. Apparently the negativity effect occurs only within the limits set by the PNA-principle.

The PNA-principle was confirmed in that it was found to modulate the halo effect in the predicted way. The corresponding third-order interaction was only significant in Experiment 2. However, it should be borne in mind that the chance probability of obtaining two values that are intermediate between three higher and three lower ones in exactly the way predicted is below $p=0.002$. Moreover, the given pattern was not simply an artefact due to aggregating data over subjects. Indeed, it stood out in the individual data of no fewer than 13 subjects (23 per cent spread over the two experiments), while another five subjects displayed it in a somewhat ambiguous way because of one or more ties. Considering the extremely low probability of obtaining the pattern by chance, the statistical significance of at least 13 confirmatory cases is beyond dispute.

The convergent results of the experiments, together with previous research, may be integrated in the theoretical framework described in the introductory sections in the following way.

The evaluative inference process seems governed by several rules. One main rule seems to be the halo effect: positive stimuli evoke positive inferences (positive halo effect) while negative stimuli negative inferences (negative halo effect). Another rule seems to be that evaluative inferences show a positivity bias which modulates the halo effect: the positive halo effect is reinforced while the negative halo effect is attenuated. A third rule may be that, consistent with the PNA-concept, the attenuation of the negative halo effect by the positivity bias varies between types of evaluative inference. The attenuation would be stronger for inferences of type 3 (from direct to indirect evaluation) than for inferences of type 2 (from indirect to direct evaluation). For inferences of type 2 the negative halo effect may be preserved and even turn into the negativity effect observed by Kanouse and Hanson (1971). Inferences of type 1 were not involved in the experiments. However, the theory, together with the re-examination of some previously published data, suggests that, insofar as they are not confounded with descriptive inferences, the evaluative inferences of type 1 may follow the same rules as inferences of type 3. Consequently, the negative halo effect should also be attenuated by a positivity bias for inferences from indirect to other indirect evaluative attributes.

A fourth rule may be that in some cases the positivity bias may attenuate and even overwhelm the negative halo effect for inferences of type 2. This was observed unexpectedly for the inference of like and dislike from 'unmusical'. Contrary to the negative halo effect, but consistent with positivity bias, even musicians inferred that they would like rather than dislike an unmusical person. In search of a possible explanation we should consider that one reason why the PNA-concept predicts a negativity effect for inferences of type 2 is that negative attributes may interfere with positive attributes. A negative stimulus attributes may produce no affective negativity effect. Only an 'informational negativity effect' (Czapinski, 1988) may

occur which would consist of an increased mental activity triggered by the stimulus to be isolated. The idea that 'unmusical' would be such an attribute has intuitive appeal. The negative consequences of an individual's 'unmusicality' may show up only if one engages in musical activities with that person. It is very easy to isolate musical activities from other social activities and hence to avoid unpleasant musical activities with one's unmusical friends. The same cannot be said about negative attributes such as 'unreliable' and 'selfish'. The negative consequences of these attributes are not limited to a well-defined field of activity that can be easily isolated from other fields of activity. A person's selfishness or unreliability may on most occasions be perceived as a potential source of negative consequences for other people, irrespective of how those others are dealing with the person and in which activities they are engaging with him or her.

An alternative explanation may be advanced assuming that 'musical-unmusical' does not appeal to approach-avoidance related evaluations, even if the subjects are musicians. Perhaps musicality is primarily associated with competence which, together with ambition, self-confidence, power, etc. constitutes a dimension called 'self-profitability'. As shown elsewhere (Peeters and Czapinski, 1990), this dimension has an evaluative character but is very ambiguous relative to approach-avoidance and, for that reason, not suited for affective negativity effects.

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