Cognitive processing of causal explanations: a sociocognitive perspective

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Abstract

This article is aimed at providing further supporting evidence for the assumption that the cognitive processing of certain kinds of information is socially driven, even at very low levels of processing. More specifically, we hypothesize that knowledge associated with a social norm like the norm of internality (Jellison & Green, 1981; Baarns & Dubois, 1988) may be more accessible in memory than knowledge associated with a non-normative register, and may therefore be processed more easily. Experiment 1 shows that adults in a cognitive overload situation who were presented either with internal attribution statements (normative) or with external attribution statements (non-normative) managed to recall some of the former, but proved incapable of recalling any of the latter. Experiment 2 allows us to show that 10- and 11-year-old children (age at which the norm of internality is being acquired) in an analogous situation were not able to process internal attribution statements unless they were pre-trained to detect the value associated with normative causal explanations. Experiment 3 enables us to verify that training adults in this way did not change the conclusions drawn in Experiment 1. The results as a whole are discussed in terms of the potential storage in semantic memory of the social value associated with normative explanations.

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INTRODUCTION

Jellison and Green (1981) tested the hypothesis that internal beliefs about reinforcements (Locus of Control: Rotter, 1966; Phares, 1976) are endowed with a kind of social desirability. Along with the cognitive analysis (biases or errors) of the overestimation of the weight of the actor as a causal factor, demonstrated by Ross (1977), there could be a normative analysis based on the social valuing of internal explanations. Such an analysis led to the assumption of the existence of a norm of internality. Later, Beauvois and Dubois (1988) systematized this idea and showed that such an internality norm may underlie all processes aimed at finding causal explanations for psychological events, whether a matter of reinforcements or behaviors. The norm of internality has been defined as the social valuing of explanations of behaviors (attributions) and reinforcements (locus of control) that accentuate the causal role of the actor.

Several arguments support the idea that there exists such a general norm for explanations of psychological events (Dubois, 1994): (1) the attribution of value to internal explanations is the product of social learning, (2) the norm of internality is highly characteristic of privileged social groups, and (3) the internality norm permits the attribution of value to persons, and by this token, enters into the judgments people make. The term 'norm' as we conceive of it here does not refer to the statistical mode of a distribution. It must be understood in terms of its power to determine the distinction between behaviors or judgments based more on their social utility than on their truth value. Moreover, if norms are the product of social learning, it is because they 'do not depend on pure maturation processes, nor on psychophysiological laws' (Dubois, 1994, p. 28) and allow the members of a given community to acquire a means of recognizing the utility associated with them.

Thus, whenever explanations of an event are proposed to individuals, some of them turn out to be viewed more positively than others, namely, the internal ones, which are the bearers of 'value' or social approval (Jellison & Green, 1981; Beauvois & Dubois, 1988). These findings do not counter the now well-established facts that (1) individuals in everyday situations do not often spontaneously engage in causal inference making (Langer, 1978), which in fact occurs in highly specific cases (Weiner, 1986: only unusual or unexpected situations lead to abundant inference making), and (2) whenever individuals attempt to report what they do or what happens to them, the explanations they produce are not based on the internal/external dimension and are often difficult to categorize in terms of this dichotomy (Kruglanski, 1975; Van der Pligt, 1981; Deschamps, 1987; Hewstone, 1989). In other words, the social norm of internality does not account for the explanations produced, but for the social value (approval) attached to the ones that are internal.

This type of value attribution to certain kinds of explanations must have some consequences at the cognitive level. There are in fact a number of findings in the literature that support this idea. According to Smith and Zarate (1992), who looked at the influence of cultural dimensions in categorization tasks, any trait or feature that goes against a dominant cultural value will turn out to be distinctive, and as such, will guide and orient cognitive processing. Zarate and Smith (1990) reported three studies showing how the categorization of photographs of faces was affected by dimensions...
that were inconsistent with dominant cultural values. For example, black men were more often categorized as persons with black skin than as males, whereas white women were more often categorized as females than as persons from a European ethnic background. Clearly, the dimension that goes against the dominant value (black or female) becomes the crucial characteristic in the processing. These results are similar in number of respects to the findings of studies on the dimensions of causal explanations.

In this line, Channouf, Py and Somat (1991) studied potential differences in the properties of the internal and external causal explanation registers and how such differences might affect cognitive processing. In an initial series of studies, they showed that internal causal explanations were memorized differently from external ones. Participants in the experimental group had to memorize internal attribution statements, while participants in another group had to memorize external attribution statements. After memorization, everyone had to recognize the memorized items from among a list of items containing the ones presented to the two groups during the encoding phase, along with as many other items that had not been presented. The results showed first of all that those who had memorized internal statements recognized fewer items than those who had memorized external ones. Second, the rate of "congruent" false recognitions (the same type of explanation as the memorized statements) was lower for the former than for the latter. From these initial results one can conclude, at the very least, that the internal attribution register, a carrier of more social value than the external register (because it generates more social approval), is subject to a different kind of cognitive processing. These results also suggest that external statements are more distinctive than internal ones during encoding (because they go against dominant cultural values: Smith & Zarate, 1992). In another experiment, this time on the categorization of internal or external statements, categorization was more limited in the external explanation register than in the internal explanation register (in the sense that fewer categories were produced in the former than in the latter). The participants probably saw fewer differences among external explanations because they all went against basic cultural presuppositions, for the internal explanations, insofar as the cultural dimension was not brought to bear in the categorization, they perceived the explanations as less similar to each other and so were able to make use of categorical labels based on semantic proximity. In categorization, then, individuals appear to rely more on the external dimension ("counter-cultural") than on the internal dimension (cultural).

The psychosocial literature also includes a number of studies showing that the value associated by an individual to an object has an early impact on cognitive processing. Bruner and Goodman (1947) studying children at about the age of ten found that the diameter of coins was overestimated in comparison to same-size pieces of cardboard. One of their findings confirmed the effect of the 'value' attributed to stimuli on how they were processed: the observed perceptual overestimation was greater among children from an underprivileged socioeconomic environment than among children with a more favorable background. A study by Postman, Bruner and McGinnies (1948) showed that the value attributed to a stimulus is even a determining factor in selective perception. Participants had to recognize 36 words representing a category of values (political, social, religious, esthetic, etc.). Each word was presented three times for increasingly longer exposure times. A link was observed between the personal values of the different participants and the time taken to recognize the words representing those values: words associated with strong values were recognized faster.
than ones associated with weak values. More recently, a study by Erdelyi and Appelbaum (1973) on recall performance in the presence of objects symbolizing strong negative or positive values, and the studies by Hansen and Hansen (1988, 1994) on facial expressions, demonstrated that the value granted to a given stimulus has a substantial effect on the amount of attention directed towards it.

In any case, the value (social, cultural, economic, affective, etc.) associated with a stimulus has an impact on the way it is processed cognitively. While high-level processes like categorization or recognition (conscious cognitive activities whose outcome is determined by the individual’s intent) appear to be affected by dimensions that go against social values (Zarate & Smith, 1990; Smith & Zarate, 1992; Channouf et al., 1991), lower-level processes (corresponding to unconscious cognitive activity whose outcome is not under the individual’s control) appear to be affected by socially valued dimensions (Niedenthal & Kitayama, 1994). Accordingly, what is observed when objects endowed with an affective or economic value are processed at a low level should also be observed in cases of social value. Social value may therefore guide and orient cognitive processing. Internal explanations, being socially valued, should prove to be more accessible, and, compared to external explanations, should be subject to spontaneous processing, at least initially. It is not until later that characteristics which go against prevailing values are likely to be taken into account (Channouf et al., 1991; Gilbert, Pelham & Krull, 1988). A simple way to test this hypothesis—that relative to external explanations, internal explanations may lend themselves to spontaneous processing—would be to use the cognitive overload paradigm. Participants concurrently performing a problem-solving task and being presented with internal explanation statements should prove capable of processing more statements than participants presented with external explanation statements. Given that the cognitive system has a limited processing capacity (Broadbent, 1958; Kahneman, 1973), restricting the encoding process by generating an overload should help us determine which stimuli are processed spontaneously and which require more attention.

**EXPERIMENT 1**

It was hypothesized here that the cognitive contents of the internal causal explanation register are processed more spontaneously than those of the external register. In other words, internal explanations should be processed even under conditions of cognitive overload, while external explanations should not.

**Method**

**Participants**

Forty-eight volunteer university students recruited from various fields of study participated individually in the experiment.

2Using this paradigm could have led us to speak of post-conscious automaticity (Bargh, 1989), thought to correspond to independent effects that take place without requiring the subject’s attention. In the current state of the data, it seemed wiser to follow in the footsteps of others (Gilbert, Pelham & Krull, 1988) and employ the term ‘spontaneous’, which has a much broader scope. The expression ‘spontaneous process’ should be understood to mean processes that ‘do not require much effort or conscious attention’ (Gilbert & Malone, 1995, p. 29).
Materials

Sentences were constructed which systematically associated an event (a behavior or a reinforcement) to an explanation that was either internal, external, or neutral (neither internal nor external; the neutral explanations were in fact meaningless sentences). The number of words was essentially the same in all sentences. For each event, the internal explanation involved a personality trait or intention of the actor, the external explanation involved luck, chance, or 'powerful others', and the neutral explanation was a grammatically correct, meaningless sentence that was unrelated to the psychological event being explained. In all cases, the actor was involved in the explanation proposed for the events (behaviors or reinforcements).

- Example of an internal explanation: 'François drinks too much because he is very depressed'.
- Example of an external explanation: 'François drinks too much because he is unemployed'.
- Example of a meaningless explanation: 'François drinks too much because he is a full ashtray'.

All sentences were recorded in the same female voice and all recordings were approximately the same length. Sentence enunciation time varied between 3.3 and 3.7 seconds. The time lapse between the reading of two consecutive sentences was less than half a second.

Procedure

The participants were brought individually into the laboratory. The experimenter presented the task as an arithmetic problem-solving exercise under disrupted auditory conditions. The participant was seated facing a computer screen on which various series of numbers would be displayed and questions would be asked. For example, the series '7, 14, 21, 77, 154, 308, 770' was displayed below the question 'Multiples of 7?'. This task was performed at the same time as a speaking voice was heard through earphones. The participant was asked to try not to listen to the speech and to direct all of his or her attention towards solving the problems. The participants were divided into three equal-size groups, each of which heard a series of 13 psychological events (behaviors and reinforcements). Each event was followed for the first group, by an internal explanation, for the second, by an external explanation, and for the third, by a meaningless explanation. At the end of the first phase, the experimenter explained that the true experimental materials were the unintentionally heard sentences. The participant then performed a cued recall task in which he or she was given the beginnings of the sentences and asked to try to remember the endings, i.e. the behaviors or reinforcements. Participants who said they could not recall any of the explanations were asked to try to remember them or at least to propose some explanation even if they were not sure they had heard it. Their responses were compared to the original sentences. We considered a response to be correct if all the important words were properly reported, even if the overall structure of the sentence differed somewhat. We were also interested in incorrectly recalled explanations, which were explanations produced during the recall phase that were not among the
sentences presented earlier. Each incorrectly recalled sentence was then categorized whenever possible as ‘internal’ or ‘external’.

Results

Correct Sentence Recall

There was a main effect of the type of sentence heard ($F(2, 45) = 41.65; p < 0.001$). Table 1 shows that internal explanations were recalled better than external ones ($F(1, 45) = 58.44; p < 0.001$) and better than meaningless ones ($F(1, 45) = 66.22; p < 0.001$). On the other hand, no significant difference was found between external explanation recall and meaningless explanation recall ($F(1, 45) < 1; n.s.$).

Incorrect Sentence Recall

Table 2 shows first that for all experimental conditions pooled, there were more incorrect internal explanations than incorrect external ones ($F(1, 45) = 250.89; p < 0.001$). This effect was also found in each experimental group taken separately ($F(1, 45) = 52.70; p < 0.001$, for participants who heard internal explanations; $F(1, 45) = 145.72; p < 0.001$, for participants who heard external explanations; $F(1, 45) = 65.67; p < 0.001$, for participants who heard meaningless explanations).

Change in Scoring Method

There is nothing in these results that allows us to determine which responses resulted from the actual memory of the material heard and which ones were 'invented' by the participant when confronted with the psychological event. In other words, we wanted to find out whether the internal explanations heard were not simply the ones the
individuals would have spontaneously produced if they had seen these events, even if they had no recollection of the sentences actually presented. To achieve this goal, a new way of scoring was necessary. The responses of participants who had been given external or neutral explanations were scored as ‘correct’ not only when they recalled or used the behavior using the external or neutral sentence heard, but also when they used the attribution sentence presented to the participants given internal explanations. This new scoring method would allow us at the very least to avoid the possible, though not very probable, artefact linked to the idea of ‘the right explanation’, i.e. one that would co-occur with certain behaviors or reinforcements so often that it would be offered up spontaneously upon the mere presentation of the event. The scoring method did not change for the participants who heard internal explanations.³

The type of sentence heard had a main effect (F(2-45) = 5.54; p < 0.01). The results shown in Table 3 confirm the finding that participants who heard internal explanations recalled more correct explanations than the others, even when allowances were made for potentially invented explanations. Their correctly recalled explanations outnumbered the correctly recalled explanations and internal explanations combined for individuals having heard external explanations (F(1-45) = 5.92; p < 0.02) and for individuals having heard meaningless explanations (F(1-45) = 10.13; p < 0.005). On the other hand, there was no difference in the number of correct and internal explanations combined produced by participants who heard external explanations and those who heard meaningless ones (F(1-45) < 1; n.s.).

Discussion

As hypothesized, we were able to show that the type of sentence ‘heard’ in a cognitive overload situation had an impact on the number of explanations correctly recalled. Individuals exposed to internal attribution sentences did exhibit some ability to memorize explanations under encoding conditions that were hardly conducive to memorization. But neither the participants who heard meaningless explanations nor those who were given external attribution sentences were capable of recalling a single sentence under the same conditions. All in all, it would seem that in cases of cognitive overload, only sentences based on a normative premise (here, internal attributions) are likely to be retrieved from long-term memory. These results appear to confirm the

<table>
<thead>
<tr>
<th>Internal explanations</th>
<th>External explanations</th>
<th>Meaningless explanations</th>
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</thead>
<tbody>
<tr>
<td>2.13</td>
<td>1.31</td>
<td>1.06</td>
</tr>
<tr>
<td>1.15</td>
<td>0.79</td>
<td>0.85</td>
</tr>
</tbody>
</table>

³Note that another scoring method consisting of counting the external explanations produced spontaneously would not have been useful given the extremely small number of correctly recalled external explanations (see Table 1). The same holds true for the meaningless explanations.

idea that some of the contents of the internal causal explanation register are more accessible than the contents of the external register. The former are probably processed spontaneously. Moreover, when the participants produced incorrect explanations, they were nearly always internal ones, no matter what type of sentence had been heard. One cannot conclude, then, that what individuals do is simply activate the register of the causal explanations heard. These findings can be ascribed to the accessibility of knowledge associated with internal explanations. It is probably the social value of these explanations that makes them more accessible. It therefore appears legitimate to postulate that this process is a function of the acquisition of the internality norm. If so, one should not observe such easy access to knowledge associated with internal explanations among individuals for whom those explanations do not convey social desirability. Children between the ages of 10 and 12, an age where the internality norm is not yet fully acquired (Dubois, 1988), should not have greater access to internal explanations than to external explanations in a cognitive overload situation. If we agree that social norms are acquired with age, then we can also hypothesize that their acquisition could be accelerated, for example, by exposing participants to a model, as Bandura and McDonald (1963) did for moral judgments, or as Doise and Palmonari (1984) did for the actualization in children of different cognitive operations during social interaction with an adult. Training aimed at facilitating access to the internal causal explanation register should allow us (1) to verify whether children, unlike adults, do not have spontaneous access to internal causal explanation knowledge, and (2) to show, if we manage to actualize the social value that these explanations carry, that children are able to process them without intentional control.

EXPERIMENT 2

In studying causal explanations, several authors (Beauvois & Dubois, 1991; Channouf, Le Manio, Py & Somat, 1993) have raised the issue of the feasibility of activating the internal causal explanation register. They have found that it was possible to activate the desired explanatory model (internal or external) in participants by asking them to pay careful attention to the content of a questionnaire in which only the answers corresponding to one of the two explanatory registers had been checked by a fictitious individual. This task involves appropriating the fictitious respondent's way of thinking so that later, one can act and think as he or she would. Note that this simple intuitive appropriation, in conjunction with role-playing instructions, proved to be capable of inducing an internal or external orientation: a post-experimental measure aimed at determining whether the activation process had actually taken place showed that the technique was in fact effective. However, this procedure is not sufficient for our purposes here, since our idea was not only to activate the internal causal explanation register, but also to try to enhance accessibility to the value attached to internal explanations. A situation that could meet these two objectives would be one that would lead participants to reliably ascertain, on their own, that explanations granting weight to the actor's causal role are viewed positively. Children could be trained accordingly to preferentially choose explanations from the internal register in a situation in which they would earn points if they
chose that type of sentence and would lose points if not. After such a training phase, we would expect the children to perform as well as the adults in Experiment 1 and to therefore be just as capable of correctly recalling a few internal explanations in a cognitive overload situation. On the other hand, they should not be capable of recalling more internal explanations than external ones if they have not been trained.

Method

Participants

Forty-eight pupils aged 10 and 11 divided into four groups of 12 participated in the experiment.

Materials

For the first phase, the materials consisted of 40 events (reinforcements or behaviors) associated with an internal explanation and an external explanation. The sentences were taken from the QIAL (Questionnaire of Internality Attribution/Locus: Bertone, Delmas, Py & Somat, 1989). For the second phase, there were 15 new sentences constructed in such a way that they systematically associated a behavior or a reinforcement to an explanation that was either internal (actor's personality trait or intention) or external (luck, chance, circumstances, powerful others). The sentences were taken from the same questionnaire and did not differ substantially in the number of words they contained. The behaviors and reinforcements always referred to the actor by his or her first name.

- Example of an internal explanation: ‘Guillaume is being punished by his French teacher because he really talks too much’.
- Example of an external explanation: ‘Guillaume is being punished by his French teacher because he really has bad luck’.

The sentences were recorded in a female voice. All recordings were approximately the same length, with sentence enunciation time ranging from 3.3 to 3.7 seconds. Again, the time lapse between the reading of two consecutive sentences was less than half a second.

Procedure

This experiment was run in two phases. During the first, the ‘training phase’, half of the participants (24) were brought individually into the laboratory. The experimenter presented the task as a game in which the goal was to correctly answer questions so as to earn as many points as possible. Each pupil was then seated facing a computer

4An additional experiment was conducted on 11- and 12-year-olds to assess the training effect. The trained children did indeed supply more internal explanations when answering a questionnaire after the training phase than the untrained ones did ($F(1,48) = 7.79; p < 0.01$).
screen where behaviors or reinforcements were displayed, followed by internal or external explanations. Using the mouse, the children were supposed to click on one of the two explanations. If the internal explanation was chosen, they earned two points and if the external explanation was chosen, they lost two points. After each question, the score was displayed on the screen with the points just earned (or lost) added to (or subtracted from) the previous score. The purpose of this procedure was to inform the child that explanations stressing the role of the actor were ‘good’ and that explanations based on chance, luck, or ‘powerful others’ were ‘bad’. The second phase was run on all participants (48), who were divided into four equal-size groups. For the 24 children who had undergone the training phase, the experimenter announced that the second part of the study was going to begin. For the other 24 children, the experiment started with the second phase. For all 48 participants, the task was identical in every respect to the one performed in the first experiment: participants had to solve complicated arithmetic problems (suited to children of this age) at the same time as they listened to attribution sentences. Their responses for the sentences heard were compared to the original sentences. A response was considered correct if all important words were reported, even if the overall organization of the sentence differed somewhat.

Results

Correct Sentence Recall

The results are given in Table 4. The type of sentence had an effect on the number of explanations recalled ($F(1, 41) = 15.07; p < 0.001$): internal explanations were recalled better than external ones. The analysis of variance did not yield a training effect, however ($F(1, 41) < 1$; n.s.). The interaction between the type of sentence heard and participation (or non-participation) in the training phase was only marginally significant ($F(1, 41) = 3.05; p < 0.09$). Looking more closely at the local effects, we find a statistically significant difference between the number of internal and external explanations recalled when participants were trained ($F(1, 41) = 16.25; p < 0.001$). When they were not trained, no such difference was obtained ($F(1, 41) = 2.22; n.s.$). Note also a marginally significant difference for the participants who heard internal explanations between the trained children and the untrained ones ($F(1, 41) = 3.52; p < 0.07$). This difference was not observed among the participants who heard external explanations ($F(1, 41) < 1$; n.s.).

5Three pupils were eliminated from the data processing, two from the external-explanation/untrained group because they did not follow the recall instructions given by the experimenter (they did not answer all of the cued recall items), and one from the external-explanation/trained group because his score was located three standard deviations from the group mean and he obviously had not followed the instructions about focusing on the problem-solving task.

6As in Experiment 1, the same alternative scoring method was used here in order to take into account any internal explanations that might have been produced spontaneously. The results obtained with the new scoring method supported the line of reasoning proposed here and were comparable in all respects to the ones presented above: type-of-sentence effect ($F(1, 41) = 5.30; p < 0.03$); training effect ($F(1, 41) = 12.20; n.s.$); interaction effect ($F(1, 41) = 2.10; n.s.$); type-of-sentence effect for trained participants ($F(1, 41) = 7.22; p < 0.02$) and untrained participants ($F(1, 41) < 1$; n.s.); and training effect for internal-explanation group ($F(1, 41) = 3.50; p < 0.07$) and external-explanation group ($F(1, 41) < 1; n.s.$).
Table 4. Mean number of correctly recalled explanations, by type of sentence heard and participation (or non-participation) in the training phase (means shown in bold, standard deviations in italics)

<table>
<thead>
<tr>
<th></th>
<th>Internal explanations</th>
<th>External explanations</th>
</tr>
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<tbody>
<tr>
<td>Untrained</td>
<td>1.83</td>
<td>1.00</td>
</tr>
<tr>
<td></td>
<td>1.40</td>
<td>1.15</td>
</tr>
<tr>
<td>Trained</td>
<td>2.83</td>
<td>0.64</td>
</tr>
<tr>
<td></td>
<td>1.70</td>
<td>0.67</td>
</tr>
</tbody>
</table>

Table 5. Mean number of incorrectly recalled internal and external explanations, by type of sentence heard and participation (or non-participation) in the training phase (means shown in bold, standard deviations in italics)

<table>
<thead>
<tr>
<th></th>
<th>Internal explanations</th>
<th>External explanations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Untrained</td>
<td>Correct internal explanations</td>
<td>10.17</td>
</tr>
<tr>
<td></td>
<td>Correct external explanations</td>
<td>2.08</td>
</tr>
<tr>
<td></td>
<td>Incorrect internal explanations</td>
<td>2.67</td>
</tr>
<tr>
<td></td>
<td>Incorrect external explanations</td>
<td>1.78</td>
</tr>
<tr>
<td>Trained</td>
<td>Incorrect internal explanations</td>
<td>9.50</td>
</tr>
<tr>
<td></td>
<td>Incorrect external explanations</td>
<td>2.19</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.08</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.08</td>
</tr>
</tbody>
</table>

Incorrect Sentence Recall

The results in Table 5 indicate that the participants produced more incorrect internal explanations than external ones ($F(1,41) = 322.98; p < 0.001$). More precisely, this difference was observed whether or not the children had been trained, and whether or not they had heard internal or external explanations (trained/internal group: $F(1,41) = 63.40; p < 0.001$; trained/external group: $F(1,41) = 113.48; p < 0.001$; untrained/internal group: $F(1,41) = 64.83; p < 0.001$; untrained/external group: $F(1,41) = 88.52; p < 0.001$).

Discussion

Experiment 2 brought out two important points for our purposes here. First, even though the expected interaction between the type of attribution sentence and the training was only marginally significant, it was nevertheless true (1) that at an age when the internality norm has not yet been acquired, the children were incapable of processing internal causal explanations in a situation where not enough attentional resources were available; Experiment 1 had enabled us to show that adults are capable of doing so; and (2) that these same children (and this result strengthens the preceding observation) were able to spontaneously process internal explanations when, via training, their ascertainment of the social value associated with this type of
explanation was facilitated. Second, no matter what type of sentence was heard, the incorrect explanations were more often internal than external. This argues in favor of the idea that the correct recall results cannot be ascribed to the mere activation of an explanatory register. Indeed, one could assume that the fact of hearing a certain type of sentence would activate the corresponding explanatory register, and that participants would produce more incorrect explanations from the activated register than from the non-activated one. Yet the results showed that for all participants, incorrect internal explanations outnumbered incorrect external ones, which rules out the explanatory register activation hypothesis. The same line of reasoning can be used in regards to the training effect on incorrect explanations: regardless of whether the children had been trained to detect the value attached to internal explanations, they always incorrectly recalled more internal explanations than external ones. Since these findings do not seem to be rooted in the activation of an explanatory register, they lead us to contend that they stem from the greater accessibility of internal explanations, probably due to the social value with which they are marked. The fact that, in a laboratory setting, we were able to trigger value attribution to internal explanations in 10- and 11-year-olds (who have not yet acquired the internality norm) suggests that we could obtain further support for our claim if we found cases where comparable training of adults in the use of the internal register only had a minor effect on the processing of attribution sentences.

EXPERIMENT 3

Our second experiment provided supporting evidence for the idea that it is possible to promote spontaneous access to the cognitive contents of the internal causal explanation register via simple training in the detection of the social value attached to such explanations. If we acknowledge the fact that adults are already able to spontaneously access the contents of the internal register, then we can assume that training will have little effect on their processing capacity under conditions of cognitive overload: trained participants should perform much like untrained ones when it comes to the number of correctly recalled explanations. More specifically, adults (trained or untrained) who have been aurally exposed to sentences from the internal causal explanation register should correctly recall more explanations than adults (trained or untrained) aurally subjected to sentences from the external causal explanation register. One of the merits of this hypothesis lies in the fact that, as we have already seen, there are cases where it is possible to reject it. This experiment will also provide the opportunity to verify the results of Experiment 1.

Method

Participants

Sixty volunteer university students recruited from various fields of study participated individually in the experiment.
Materials

For the first phase of the experiment, which involved training the participants in detecting the value attached to internal explanations, the materials consisted of 40 sentences (reinforcements or behaviors) associated with one internal explanation and one external explanation.

For the second phase, all sentences (different from the ones used in Experiment 1) had approximately the same number of words. Each event was explained either by an internal explanation (actor’s personality trait or intention) or by an external explanation (luck, chance, ‘powerful others’). In all sentences, the actor was involved in the proposed explanation of the events (behaviors or reinforcements).

Procedure

The experimental procedure was the same as in Experiment 2 run on children, except that the arithmetic problems were the ones used in Experiment 1.

Results

Correct Sentence Recall

As a whole, the results in Table 6 indicate that internal explanations were recalled better than external ones ($F(1, 56) = 29.16; p < 0.001$). The analysis of variance did not reveal a training effect ($F(1, 56) < 1$; n.s.). The interaction between the type of sentence heard and participation (or non-participation) in the training phase was nonsignificant ($F(1, 56) = 1.38$; n.s.). Looking more specifically at the local effects, we can see that there was a statistically significant difference between the number of internal and external explanations recalled by both trained ($F(1, 56) = 21.61$; $p < 0.001$) and untrained ($F(1, 56) = 8.93$; $p < 0.005$) adults.

Incorrect Sentence Recall

The results in Table 7 indicate that the adults incorrectly recalled more internal explanations than external ones ($F(1, 56) = 194.97; p < 0.001$). This result was found in each experimental group. More specifically, the difference was observed whether the participants were trained or untrained, and whether the explanations they heard were internal or external (trained/internal group: $F(1, 56) = 40.45; p < 0.001$; trained/external group: $F(1, 56) = 90.32; p < 0.001$; untrained/internal group: $F(1, 56) = 27.71; p < 0.001$; untrained/external group: $F(1, 56) = 46.23; p < 0.001$).

The same alternative scoring method as in Experiment 1 was used again here (aimed at taking into account any spontaneously produced internal explanations). The results obtained with the new scoring method were consistent with our line of thinking and were comparable in all respects to the results presented above: type-of-sentence effect ($F(1, 56) = 20.25; p < 0.001$); training effect ($F(1, 56) < 1$; n.s.); interaction effect ($F(1, 56) < 1$; n.s.); type-of-sentence effect in trained participants ($F(1, 56) = 12.25; p < 0.001$) and untrained participants ($F(1, 56) = 8.20; p < 0.01$).
Table 6. Mean number of correctly recalled explanations, by type of sentence heard and participation (or non-participation) in the training phase (means shown in bold, standard deviations in italics)

<table>
<thead>
<tr>
<th></th>
<th>Internal explanations</th>
<th>External explanations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Untrained</td>
<td>2.07</td>
<td>0.87</td>
</tr>
<tr>
<td></td>
<td>1.03</td>
<td>0.99</td>
</tr>
<tr>
<td>Trained</td>
<td>2.33</td>
<td>0.47</td>
</tr>
<tr>
<td></td>
<td>1.45</td>
<td>0.83</td>
</tr>
</tbody>
</table>

Table 7. Mean number of incorrectly recalled internal and external explanations, by type of sentence heard and participation (or non-participation) in the training phase (means shown in bold, standard deviations in italics)

<table>
<thead>
<tr>
<th></th>
<th>Internal explanations</th>
<th>External explanations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Untrained</td>
<td>7.80</td>
<td>9.13</td>
</tr>
<tr>
<td></td>
<td>1.86</td>
<td>2.69</td>
</tr>
<tr>
<td>Incorrect internal explanations</td>
<td>3.00</td>
<td>2.93</td>
</tr>
<tr>
<td></td>
<td>1.31</td>
<td>2.76</td>
</tr>
<tr>
<td>Trained</td>
<td>8.20</td>
<td>10.60</td>
</tr>
<tr>
<td></td>
<td>1.15</td>
<td>1.45</td>
</tr>
<tr>
<td>Incorrect internal explanations</td>
<td>2.40</td>
<td>1.93</td>
</tr>
<tr>
<td></td>
<td>1.45</td>
<td>1.33</td>
</tr>
</tbody>
</table>

Discussion

This experiment confirmed the results of Experiment 1 by showing once again, with adults, that under conditions of cognitive overload, only sentences based on a social norm (here, internal attributions) can be retrieved. This result supports the idea that some of the cognitive contents of the internal causal explanation register are accessed more spontaneously than the contents of the external register (even when neither register is activated by the procedure, as indicated by the systematically higher number of incorrect internal explanations than external ones under all experimental conditions). Our observation that training (effective in children who were not yet able to detect the value attached to causal explanations) had no effect here on correct recall performance—and as such, cannot be reduced to a simple reinforcement procedure—supports the idea that explanation accessibility is linked to the acquisition of the internality norm.

CONCLUSION

We have seen here that normative information is processed differently from non-normative information. Experiment 1 showed that internal attribution statements seem to be more accessible in memory and may be processed more spontaneously than external attribution statements. The social value attached to internal attributions
due to their greater social acceptability in everyday conversations may be what makes them more readily available. Experiment 2 showed that this phenomenon did not occur in children. Like all other social values, internal attributions are acquired through socialization in the course of development, so the lack of higher accessibility for internal attributions relative to external ones in children suggests that spontaneous access to them is not yet in place at this age (Dubois, 1988). The fact that training in detecting the value attached to internal explanations tended to facilitate spontaneous processing in a population of this age (Experiment 2), while being totally ineffective in adults (Experiment 3), supports this contention. Moreover, analysis of the incorrectly recalled explanations showed that these results were not the mere product of the activation of an explanatory register. No matter what type of attribution sentences the participants heard (Experiments 1, 2, and 3), whether or not they underwent a training phase aimed at pointing out the value attached to internal explanations (Experiments 2 and 3), and whether the participants were children (Experiment 2) or adults (Experiments 1 and 3), the incorrectly recalled internal explanations always outnumbered the incorrectly recalled external ones. If no explanatory register was activated, then the correct recall can only be ascribed to the spontaneous processing of the cognitive contents of the internal register, which benefits from the greater value characteristic of this explanatory register.

The idea that there may very well exist knowledge in the internal causal explanation register that is more accessible or easier to activate than that in the external register has a number of theoretical points in common with several current areas of research in the field of social cognition, particularly with the studies by Gilbert and colleagues (Gilbert et al., 1988; Gilbert & Malone, 1995). Drawing from the work by Tramutone (1982) and Trope (1986), these authors proposed a three-step attribution model: the first step characterizes the action, the second makes a dispositional inference, and the third corrects the dispositional inference by taking situational causes into account. One of the specificities of this model lies in the idea that the steps get increasingly costly in terms of the processing load. The first two are thought to be virtually automatic, while the third would rely on processes that are more controlled. The spontaneity of dispositional inferences seems to support the idea that the cognitive contents of the internal causal explanation register benefit from spontaneous access.

A question that can be raised here is: What knowledge in the internal causal explanation register produces the observed effects? In the light of the results obtained here with children, who performed exactly like adults when trained, the knowledge in question is probably marked by the social value known to be attached to explanations of this kind. This value could lead to the semantic memory storage of the cognitive content associated with the value-bearing explanations. Indeed, if we agree with Tulving (1983), controlled processes are more like episodic memory than semantic memory. It is therefore probable that knowledge associated with the external causal explanation register is stored in episodic memory, and that knowledge associated with the internal register is stored in semantic memory. Having been transferred to semantic memory, this knowledge can be accessed spontaneously (Tulving, 1983). The hypothesis of semantic memory storage of the value of a behavior is not a new one. Regarding moral values, Hoffman (1983) defended the idea that moral standards are gradually separated from their encoding context by means of cognitive and motivational processes, only later to become values rooted in the individual's internal dispositions. Beauvois, Monteil and Trognon (1991) contend that in our theories of

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social utility, nothing precludes applying the descriptions of the processes underlying moral values to values that are more social in nature. They argue that ‘evaluative knowledge [e.g. knowledge conveyed by internal explanations] is stripped in memory of any kind of representation of the social situations from which it derived the values. As such, it appears [...] in the form of concepts and relations endowed with the permanence and the generality of the truths learned’ (p. 287). The results of the studies presented here suggest in addition that if the norm of internality is indeed a generator of knowledge that has acquired ‘a value of its own, atemporal, and out-of-context’ (p. 287), this norm is therefore at the roots of the transfer to semantic memory of the social value attached to internal explanations in Western cultures. The value with which internal causal explanations are marked may grant them a privileged status much like that of an explanatory schema. Stored in semantic memory as such, this type of schema would have the particular characteristic of being spontaneously accessible in the absence of reference to a context. A recent study by Le Floch (1997) strengthens this line of reasoning: individuals were found to spontaneously offer up more external explanations than internal ones whenever the context of the event was clearly specified; the opposite tendency was observed when the event’s context was only roughly sketched out.

The processing of internal explanations thus appears to occur spontaneously; at least a few internal explanations are encoded in a situation of cognitive overload, while practically no external ones are processed in this situation. Inversely, during more controlled tasks, external explanations (ones that go against the dominant values: Smith & Zarate, 1990, 1992) are the ones that appear to be privileged (Gilbert et al., 1988; Channon et al., 1991). These studies suggest that social phenomena—in the present case, social norms—can affect cognitive processes at various levels, including very low ones (Fazio, Roskos-Ewoldsen & Powell, 1994). Moreover, Murphy and Zajonec (1993) were able to show that judgment can be affected differently by the prior subliminal (versus supraliminal) presentation of material marked with an affective value. It may be that low-level processes are driven by dimensions that represent social values, while higher-level processes are driven by dimensions that go against dominant values. These conjectures could be confirmed via experimental studies with an integrative approach, wherein the different levels of processing and the internal and external explanatory registers are manipulated simultaneously.

REFERENCES


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