Journal of Personality and Social Psychology
1987, Vol. 53, No. 2, 280-287

0022-3514/87/$00.75

The Prevention of Mindlessness

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We conducted three experiments to assess the hypothesis that mindlessness could be prevented with a simple linguistic variation. This amounts to teaching in a conditional rather than an absolute way. Accordingly, subjects in the first two experiments were either introduced to new objects conditionally (e.g., this *could be* an X) or unconditionally (e.g., this *is* an X), and the objects used were either unfamiliar or familiar. In each study a different need was then generated for which the object in question was not explicitly suited but could fulfill. Only those subjects in the conditional–unfamiliar group gave the creative response and met the need. When subjects were asked explicitly to generate novel uses for the target items, they had no difficulty doing so. However, given the way we are traditionally taught, it simply does not occur to us to think creatively unless explicitly instructed to do so. In the third experiment we introduced an unfamiliar item in one of three ways. In addition to the groups used in the earlier experiments, we added a group that was led to believe that the object was identifiable (unconditional) but was currently unknown. We also added a second need to determine whether the original conditional group truly learned conditionally or if they were in search of an absolute understanding of the target object. Significantly more of the subjects in the conditional group gave the creative response to both needs. A conditional understanding of the world seems to prevent mindlessness.

Many studies conducted over the past decade have revealed the potential deleterious effects of mindless information processing. These consequences seem to be physical (e.g., Alexander, Langer, Newman, Chandler, & Davies, 1986; Langer, Beck, Janoff-Bulman, & Timko, 1984; Langer, Perlmuter, Chanowitz, & Rubin, 1986; Langer, Dillon, Kurtz, & Katz, 1987) as well as psychological (e.g., Chanowitz & Langer, 1981; Langer, Hatem, & Joss, 1987; Langer & Imber, 1979; Langer & Piper, in press; Langer & Weinman, 1981; Li & Langer, 1987).

Mindlessness is marked by a rigid use of information during which the individual is not aware of its potentially novel aspects. According to this definition, one deals with information as though it has a single meaning and is available for use in only that way. This results in a lack of attention to details. *Mindfulness,* on the other hand, is characterized by active distinction making and differentiation. One who demonstrates mindfulness engages in the process of creating new categories—of making finer and finer distinctions (cf. Langer, 1983; Langer, in press; Langer, Blank, & Chanowitz, 1978).

Mindlessness is based on the past, whereas mindfulness is based on the present. The problem is that as one mindfully creates a new category, that category then becomes available for mindless use. The first establishment of the category *pen* as distinguished from *pencil,* for example, is mindful. Subsequently relying on this object as a pen in the same old way without drawing any new distinctions is mindless. Mindfully created categories may be trivial or important. When mindlessly relied on, however, important self-serving information may be overlooked and, as research suggests, unnecessary debilitation may result.

The question our research addressed was to consider if there could be a way out of this problem: Is there a way to come to understand the world that does not simultaneously set the stage for limited use of that knowledge?

Previous research on the Einstellung effect or set has clearly shown how quickly people come to respond to the world in a limited and rigid fashion. The now classic water jar studies by Luchins (1942) have served as an appropriate model of this behavior (more recent work by Hoffman, Burke, & Maier, 1963, made essentially the same point). After brief experience with one solution to a problem, subjects tend to overlook a simpler solution (or more effective solution, as in the case of Hoffman et al., 1963) when it is available and appropriate. Luchins (1942) found that although subjects were more flexible when instructed to think about the problem carefully, they were still somewhat rigid.

Prevention of rigidity in this fashion is awkward and not likely to be successful over time. Parents and teachers have often told us to think carefully, apparently without much success. The rigidity seen in the Einstellung work is characteristic of mindlessness. However, mindlessness involves more than dealing with content rigidly. One may be mindless with respect to some specific content where one is simultaneously mindful of something else. Or, one may be mindless as a state of being, where

We are grateful to Robert Abelson, Robert Rosenthal, and three anonymous reviewers for their careful reading of an earlier version of this article and to Robert Rosenthal and Douwe Yntema for their statistical assistance. In addition, we are especially grateful to Leonard Roseman and Donald Rubin for the model derivation and estimation described in the Appendix. Finally, we would like to thank Robert Slate, Robert Davis, and Jordan Freidus for their generous help in conducting the first and third experiments.

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no content is actively being considered. From this view it is sensible to look, as we have done, for the physiological consequences of mindlessness (e.g., Alexander et al., 1986; Langer et al., 1986). Furthermore, mindlessness may result from a single exposure and not just from repetition. As such, we believe mindlessness is much more pervasive than Luchins (1942) believed the Einstellung effect to be. Whereas he thought that it was a result of special situational factors, we see mindlessness as a consequence of mindfulness. One mindfully creates categories and then is able to mindlessly use them.

Many negative consequences of mindlessness have been explored. The research has examined mindlessness as it occurs over time (e.g., Langer & Imber, 1979) and as it occurs from making premature cognitive commitments to information presented in a single instance (e.g., Chanowitz & Langer, 1980; Langer et al., 1986). Both cases result in a rigid structure that limits use of the information on which it was based. A premature cognitive commitment is a commitment that is unwittingly made to the meaning of information and its understood implications. One typically makes such a commitment when there is no obvious reason to consider carefully the information being presented. For example, one may make this commitment when exposed to seemingly irrelevant information. Its consequences become known when and if the information becomes relevant.

In the first of the studies on premature cognitive commitment (Chanowitz & Langer, 1981), people who were not given a reason to mindfully consider information about the symptoms of a disease that was described to them made premature cognitive commitments to that information. They accepted the information without being aware that the symptoms could have been otherwise. This was shown by examining what happened when that information became relevant. When the subjects discovered they had the disease, they were vulnerable to the symptoms previously described that they had unwittingly, unconditionally, and rigidly accepted. Comparison subjects for whom the same disease information initially was mindfully processed did not display the symptoms. The problem is that one cannot mindfully process every piece of information and what is irrelevant today may be relevant tomorrow.

The major quesion we considered in this research was whether there was a way to prevent premature cognitive commitments without mindfully attending to everything—a difficult matter at best. To begin answering this, we initially considered the ways in which people typically come to know their world. We questioned whether rigid use of the world stemmed in part from the absolute way in which most of what we know is taught. Objects, characteristics, and ideas exist on continua, yet people learn about them as though they are discrete categories. People are educated into this discrete world by naming objects (events, ideas, and people) absolutely (e.g., this *is* an X).

Perhaps this deceptively simple linguistic form encourages mindlessness. If this were the case, the learner so taught would not be aware of alternative uses for these objects. Conversely, a conditional or probabilistic view of the world would enable subsequent cognitive flexibility. Premature cognitive commitments might be prevented without necessitating that people mindfully attend to everything if the world and its parts were taught conditionally. The question then is whether mindlessness can be discouraged by a conditional rather than an absolute view of the world.

We conducted the following three experiments to assess this hypothesis. Specifically, we hypothesized that introducing people to objects in a conditional way (e.g., this *could be* an X) would result in the potential for mindful, creative use of those objects. Likewise, we expected that naming objects absolutely would encourage rigid, automatic use of the same information.

Experimental Overview

In the first two studies, we used a 2 × 2 factorial design. Subjects were shown novel or familiar objects that were introduced unconditionally (e.g., "This is an X") or conditionally (e.g., "This could be an X"); in the latter case, the objects were named. A need was then generated for which the object in question was not explicitly suited but could fulfill. In an independent assessment, the familiar and unfamiliar objects were determined equally able to fulfill the needs. We hypothesized that mindful use of that object would result only if it were initially processed conditionally (or, of course, if it were not yet processed at all).

If an object was deemed to be familiar, it must have been learned before the experiment. Presumably it was learned mindlessly and absolutely, for once an unfamiliar object is introduced unconditionally, its identity generally becomes set. Therefore, we expected only the conditional–unfamiliar groups to be able to meet the generated need. Thus, the familiarity variable allowed for a conceptual replication within each study.

Because we expected all of the subjects except one group in each experiment to perform mindlessly, one of the more stringent tests of this hypothesis would be to choose subjects (a) who generally function at a high intellectual level and (b) who are basically concerned about evaluation–apprehension, as these subjects would be likely to use their sharpened cognitive skills. Thus, in this instance, university students were a sensible first choice.

Experiment 1

Method

Subjects. The subjects were 20 male and 20 female Harvard University undergraduate students. They were randomly assigned (separately by sex) to one of the four conditions with an equal number in each group. The subjects were recruited on a voluntary basis by advertisements and in classrooms. One of two male experimenters conducted the tests for half of the students in each condition. The experimenters were blind to whether subjects were in the conditional or unconditional group. Subjects were tested individually.

Procedure. Subjects entered the laboratory expecting to participate in a study of consumer behavior. They were asked to leave all of their belongings in another room. Three objects were placed before them. Subjects in the familiar object condition were shown a rubber band, a polygraph pen, and a hair dryer attachment. The remaining half of the subjects in the unfamiliar object group were shown the latter two objects and an unfamiliar piece of a dog's chew toy. The experimenter then gave the subjects a questionnaire concerning the objects. A paragraph at the top of the sheet described each of the objects. Half of the subjects read the following descriptions: "Object A is a rubber band/dog's chew toy, Object B is a polygraph pen, and Object C is a hair dryer attachment."

The object descriptions for the other half of the subjects were stated conditionally. These descriptions read: "Object A could be a rubber band/dog's chew toy; Object B could be a polygraph pen; and Object C could be a hair dryer attachment." Admittedly this was an uncommon way to introduce familiar objects. However, if this wording aroused any curiosity it would work against our hypothesis, because the conditional–familiar group was expected to respond mindlessly with respect to the target object.

On the questionnaire, each subject was asked to rank what he or she believed the price of the objects to be, from highest to lowest, in each of 3 years. After the subject had completed the form, the experimenter, expressing controlled panic, exclaimed, "Oh no, I gave you incorrect instructions—you were supposed to rank from lowest to highest. I don't have any more forms and I don't have an eraser. What should I do?" If the subject suggested that the experimenter cross out the incorrect answers, the experimenter responded that he was not allowed to do so.[1] After receiving a reply, the experimenter found the "missing forms" and then proceeded to ask the subject to list as many uses as he or she could think of for the target item. This was done to determine whether or not subjects with further prodding would mention the target use. All forms were then collected and each subject was debriefed.

Dependent measures. The primary dependent measure was the response or lack of response to the experimenter's need to erase the subject's responses on the questionnaire. Although awkward for this use, both the unfamiliar dog's chew toy and the familiar rubber band had the rubber property needed to erase pencil marks.[2] It was expected that only subjects given "could be" instructions about the dog's chew toy would respond mindfully. A reply was rated as mindful if the subject suggested that the experimenter use the target object to erase the pencil marks (there were no other rubber objects in the room). It was less clear what would happen when subjects were asked explicitly to think of the object in novel ways except that we expected a good deal more responding to occur in each group.

Results and Discussion

The results were rather straightforward and strongly confirmed our hypothesis. We collapsed these results across three of the cells to reflect the focused hypothesis that subjects in the conditional–unfamiliar group would respond significantly more than would subjects in any of the other groups. Indeed, 40% of the subjects in the conditional–unfamiliar group responded mindfully with the needed novel use for the target object, whereas no one in the unconditional–familiar or the unconditional–unfamiliar groups and only one person in the conditional–familiar group did. That is, only 3% of these remaining groups responded mindfully. The chi-square analysis comparing the conditional unfamiliar group with the remaining groups was highly significant, χ^2 (1, N = 40) = 9.22; p = .002, ϕ = .48. Thus it would seem that premature cognitive commitments made in the past or present as to the use of objects restricts the creative use of those objects in the present.

On the other hand, subjects were expected to be able to generate uses when they were directly asked to do so because this is an easier task. A 2 × 2 analysis of variance (ANOVA) revealed no significant differences in the number of uses suggested by the various groups ($p > .1$).

Experiment 2

The purpose of this experiment was to replicate the primary finding of Experiment 1 with different materials and a different need situation. Further, to ensure that differences in familiarity in Experiment 1 were not a function of some other differences in the objects, we used the same object (i.e., an object containing all of the relevant properties), but named it differently in each condition of Experiment 2.

Method

Subjects. We recruited 32 female and 32 male Harvard undergraduate volunteers by advertisement in classrooms and randomly assigned the subjects (separately by sex) to one of the four conditions. The subjects were tested individually by a female graduate student (the second author) who was blind to whether subjects were in the conditional or unconditional group.

Procedure. Each subject was again informed that this was a study of consumer behavior. Again, three objects were placed before him or her for evaluation. However, in this study, half of the subjects were shown a sock, a spaghetti fork, and a pencil sharpener, and half of them were shown the latter two objects and an unfamiliar white cloth object cut from the mate of the aforementioned sock.

The experimenter then gave each subject a questionnaire about the objects. Half of the subjects read the following descriptions: "Object A is a sock/precision rotor casing, Object B is a spaghetti fork, and Object C is a pencil sharpener." The other half of the subjects read these descriptions: "Object A could be a sock/precision rotor casing, Object B could be a spaghetti fork, and Object C could be a pencil sharpener."

Each subject was next given the first page of a two-page questionnaire. As he or she began to complete the form, loud noises emanated from the hall. The experimenter left the room to investigate. Once outside, she turned on a tape recorder that then played the following conversation loud enough for the subject inside to hear: On the tape the experimenter said, "Excuse me; what's going on out here? I'm running an experiment inside and it's really noisy." A confederate replied: "I'm sorry, but I have to be here. I'm running a study on object perception, using a large plaster mold, which has been stored in one of the experimental rooms on the floor. The mold has to be cleaned—the seams have to be sanded. The Center Office people said I could clean it in the hall, because it's too heavy to move to the machine shop." The experimenter then asked whether the sanding would be dangerous, and the confederate replied that it would not, but that the plaster dust had high lime content, which is irritating to breathe—it irritates the throat and nose. The confederate asked, "Will you be here for a while?" The experimenter replied, "Yes, about 15 minutes." The confederate said, "It will only take me about 10 minutes, and once the dust settles, it's safe to be in the hall. If you have to go out before then, though, you should wear a filter mask to protect your nose and throat. If you won't be going out, I won't give you any masks, because I only have this one extra left, and there are a lot of other people on the floor." The experimenter repeated, "No, we'll be in here for about 15 minutes. Are you sure we'll be O.K. inside?" The confederate answered, "You'll be fine, so long as you don't leave the room. If you breathe in the plaster dust, you may feel sick. Are you sure you won't need a mask? I probably won't be able to hear you over the noise of the sander if you decide you want a mask once I've started." The experimenter replied, "No, we won't need a mask. Thanks."

The experimenter reentered the room and related the substance of

[1] Only two subjects suggested this alternative.

[2] Fifteen additional subjects were shown the items used in the investigation and were asked to rate on a 10-point scale how similar each of these objects was to an eraser. This independent sample viewed them as equally dissimilar (for dog's chew toy, M = 5.93; for rubber band, M = 5.46), t (28) = .78, $p > .4$, two-tailed.

the conversation to the subject (including a description of the blue, concave, oval mask), in case he or she had not overheard, and asked if the subject wanted to leave before the sander started working in the hall. In all cases, the subjects said that they wanted to continue the experiment. When each subject finished the questionnaire, the experimenter commented on his or her speed of completion. As she approached the subject to take the form, the experimenter realized that the subject had only finished the first page. The experimenter looked for the second page unsuccessfully, and then said: "Oh no, I forgot I had to make up more forms, and the second pages must be in the copy room all the way down the hall. I can't go outside and breathe in that plaster dust, but you have to finish the study immediately because another subject is coming in 10 minutes, and then I have to analyze the results and report them to my research methods course in about an hour." If the subject did not respond, the experimenter continued, "Maybe he will hear me and stop sanding," and knocked on the door, calling the name of the confederate. When this proved futile, the experimenter turned to the subject and asked, "What should I do? Any ideas?" After receiving or not receiving a response, the experimenter then realized that she had an extra form attached to her Human Subjects Committee application that the subject could use. She then took the appropriate form from a previously unsearched drawer. The form asked subjects for novel uses for the target object. After the subject finished this second page and handed in the forms, he or she was completely debriefed.

Dependent measures. The primary dependent measure was the response or lack of a response to the experimenter's need to avoid breathing plaster dust. The room had been cleared of cloth objects, and the experimenter wore a short-sleeved shirt to prevent subjects from suggesting that she breathe through her sleeve. A response was considered mindful if a subject proposed that the experimenter breathe through the target object while walking down the hall. Again, we expected that initially only the conditional–unfamiliar group (subjects who were given "could be" instructions about the precision rotor casing) would be able to mindfully respond and thus meet the need generated. Next, all subjects were asked to generate novel uses for the target object.

Results and Discussion

The results clearly replicated those of the first experiment. Again, we collapsed these results across three of the cells to reflect the focused hypothesis that subjects in the conditional–unfamiliar group would respond significantly more than would subjects in any of the other groups. Five of the 16 subjects in the conditional–unfamiliar group mindfully responded (31%), and only 1 of the 48 subjects in the other three groups (2%) responded in this way (that subject was in the unconditional–unfamiliar group).The chi-square analysis conducted was highly significant, χ^2 (1, N = 64) = 12.01; p = .0003, ϕ = .43. Again, the results indicated clearly that the subjects in the conditional–unfamiliar group were significantly more likely to solve the problem than were the subjects in the other three groups.

Next we compared the number of novel uses subjects generated when explicitly asked to do so. A 2 × 2 ANOVA revealed no significant differences in the number of uses provided by the various groups ($p > .1$). With prodding, all subjects could generate novel uses although when the need arose, it did not occur to them to do so. Even with prodding, however, subjects did not suggest that the material be used as a mask.

The findings of these experiments seem clear. Introducing people, at least adults, to a new part of their world in this conditional manner resulted in more mindful use of that information. In both experiments, subjects in this condition were able to use the unfamiliar object creatively when the need arose. Subjects who made premature cognitive commitments to the information because of the absolute way in which it was initially presented apparently were not able to meet this need.

It makes sense for us to assume that subjects could not be creative in these situations, rather than to assume that they responded that way because of some subtle demand in the experiment. To consider that subjects thought to use the object mindfully and then chose not to do so would make it hard to explain the differential effects for the familiar versus unfamiliar objects because the situation was otherwise held constant.

It is true that when attention is given to finding novel uses, subjects are able to do this. However, it does not occur to them to do so unless they are explicitly asked. We would contend that compared with the real life test situation, a novel response to a question that explicitly asks for such a response calls for far less flexibility in thinking than a response that occurs spontaneously. Such inflexibility is poorly suited to the world most people experience.

One possible artifact in this experiment is that the unfamiliar object looked more similar to the needed object than did the familiar object. If an unfamiliar object seems to be more similar to the needed object for some people, it may be because the familiar object does not seem similar to anything else as much as it does the familiar object. However, as noted earlier, we did ask subjects to rate the similarity of the objects to the needed object (i.e., eraser) and found that neither was perceived to be more similar to this item. More important, however, the potential confounding is irrelevant to the larger point, which is to explain the difference between the conditional and unconditional introduction to the object within the unfamiliar condition. In this regard it seems clear that when an object is ambiguous, it is more likely to remain available for subsequent creative use than when it is absolutely defined.

Although the results of the first two experiments were straightforward, it is less clear exactly what subjects learned. It is possible that the conditional introductions led them to process the objects such that their boundaries were truly permeable. Alternatively, people may have a need for certainty and may only be able to learn in this way temporarily, before they disambiguate the stimulus. Imagine for a moment that you are reading and cannot make out a letter. You might think, "It could be an *r*." The implication in this case is that it really is something but you just do not know what it is (perhaps it is an *n*).

If this is true, then subjects in the conditional group would be best characterized as having learned unknown absolutes rather than conditional objects. Thus if a new second need arose that this object could fulfill, it may not occur to some of the subjects to use the object again for this need. After it has met the first need, this object for some subjects may no longer be conditional. That is, after learning, for example, that an object could be a dog's chew toy and then using it as an eraser, the subject now may accept the object (absolutely) as an eraser. It would not then be used creatively in some new way. This absolute but unknown explanation is similar to what one might expect if subjects were shown an unfamiliar object and told, "This *is not* an X." Subjects would not yet be limited by a rigid understanding of what the object could be.

If correct, this alternative explanation would still be interesting because it would suggest that if we could teach subjects to learn conditionally, they would be more creative. If subjects can truly learn conditionally, the implications for our educational system may be more straightforward. Then it would seem advantageous to reorient our schools so that they teach more conditionally (cf. Langer, in press). Consequently, we conducted Experiment 3 to test these two explanations.

Experimental Overview

In Experiment 3, we introduced subjects to unfamiliar objects in one of three ways. We added a new group, the absolute unknown group, to the original unconditional and conditional groups. This group was introduced to an object conditionally, but the implication clearly was that it had an absolute identity that was simply unknown. Then a need arose. Our first prediction was a replication of Experiments 1 and 2: We expected that a creative response would more likely come from subjects in the two conditional groups. Then a second need arose. If, as we predicted, the original conditional group had processed the object in a conditional way, then the subjects should have been able to meet the second need. Thus, the conditional manipulation is believed to do more than simply vary the uncertainty that the object is an *X*. It should suggest that an object may be many things simultaneously.

If our subjects have learned conditionality, they should think to use the object repeatedly in new ways. After meeting the first need, however, the absolute unknown group would now be conceptually similar to the unconditional group. As such, we expected fewer of these group members to meet the second need than would the members of the conditional group. Although it is conceivable that one might learn conditionality with the absolute unknown instruction, our major concern here was to determine if at least a conditional introduction to objects could result in a sustained conditional use of them. The unconditional group who could not meet the original need was not expected to meet the second need.

Experiment 3

Method

Subjects. We randomly assigned 60 Harvard University undergraduates to one of the three conditions with an equal number of men and women in each group. The subjects were recruited on a voluntary basis by advertisement and were tested individually.

Procedure. All subjects were told that this was a study of stress management. Each subject was then asked to leave all personal belongings in another room. A male experimenter described various items in the room, including the target object, in one of three ways. He said: "This *is* a precision propel"; "This *could be* a precision propel"; or "I *do not know* what this *is*." The target item was an unfamiliar black rubber object. The subjects were asked to look at three pictures and answer questions about them on a computer coding sheet. Then they were told that their answers were in the wrong sections of the sheets and that the experimenter had neither additional forms nor an eraser. If subjects did not solve the problem, the experimenter found additional forms and continued with the experiment. A second need then arose. Now the experimenter said that he needed an object for the subject to squeeze while he measured the skin fold of the subject's arm because the tennis ball usually used in the experiment had been mislaid. The order of the needs was counterbalanced for all groups.

Table 1
Creative Responses as a Function of Type of Learning

Need	Instruction: Unconditional	Instruction: Absolute unknown	Instruction: Conditional
First need[a]	.25	.55	.65
Second need	.05	.25	.50
First and second need[b]	.20	.45	.77

[a] $N = 20$ for the first and second need when considered separately.
[b] Five subjects met the first and second needs for the unconditional group, 11 subjects met both needs for the absolute unknown group, and 13 met both needs for the conditional group.

Dependent measures. The dependent measures were the responses or lack of responses to the experimenter's two needs. A response to the first need was considered mindful if the subject suggested that the target item be used to erase their answers (again, there were no other rubber objects in the room). A response to the second need was considered mindful when subjects said that they could squeeze the target object (there were no other small, pliant items in the room).

Results and Discussion

We hypothesized that unlike the unconditional group, both the conditional and the absolute unknown groups would be able to meet the first need. This hypothesis was reflected in contrast weights that were used to examine the proportional data (cf. Rosenthal & Rosnow, 1985). These proportions are shown in Table 1. The results conform to this prediction ($z = 2.88$, $p = .002$) and replicate the major finding of the first two studies. Regarding the second need, we hypothesized that more people in the conditional group would respond creatively than would people in the other groups. This hypothesis was also confirmed ($z = 2.68$, $p = .0037$) as illustrated in Table 1.

We also conducted a more thorough, model-based analysis that allowed us to consider simultaneously (a) both of the needs and (b) both the subjects who did not respond to the first need and those who did respond (see the Appendix for this analysis). By using this analysis, we were able to confirm the hypothesis that the probability of responding to the second need would be greater for subjects in the conditional than in the absolute unknown group ($z = 2.019$, $p = .0217$).

The results of our study suggest that the conditional groups in Experiments 1 and 2 were not simply looking for certainty about an unknown object. The absolute unknown group in Experiment 3 may have absolutely defined the target object after encountering the first need; however, the responses to the second need do indeed suggest that the conditional group learned to consider the object flexibly. This could be an important tool at any rate in the teaching of mindfulness. The rigidity that characterizes mindlessness seems to be prevented through conditional instruction.

General Discussion

Mindfulness, in essence, involves the same process as creativity. However, the quality of the distinctions made here is not

at issue. Although many attempts have been made to assess creativity, none have found a completely satisfying way to teach it despite the desirability of doing so (Amabile, 1983; Mansfield & Busse, 1981; Mansfield, Busse, & Krepelka, 1978; Ripple & Dacey, 1967; Speedie, Treffinger, & Feldhusen, 1971). Similarly, educators know the advantages of flexible thinking. Our method of teaching conditionally may be interpreted as a way of fostering creativity and teaching flexible thought.

Our method may also be compared with an interesting study by Higgins and Chaires (1980) on creative problem solving that uses the Duncker candle problem. Subjects were given a candle and thumbtacks in a box and asked to attach the candle to the wall. Objects were labeled "a box *of* thumbtacks" or "a box *and* thumbtacks." When these (and other objects) were introduced as related entities, subjects thought to use them both and were able to solve the problem. The subjects' unusual use of the box was consistent with the new relation between the box and the thumbtacks implied by the revised language. However, it is not clear from this method that any unusual linguistic treatment would provoke further creative activity if the category were not accessible or if there were not experimental demands for a creative response. If Higgins and Chaires's subjects later needed to write a message and paper was not available, there is no reason to believe that they would now think to use the box in this way. In our research, however, subjects seemed to be implicitly learning a world view. This conditional learning, as Experiment 3 has shown, may be relevant even when the category is not explicitly made available.

In society, information is currently processed primarily in an unconditional way for several reasons. First and foremost, having been influenced directly or indirectly by classical physics, rather than quantum mechanics, most people believe in an absolute reality that is independent of human presence. Thus, by teaching absolutes one is teaching the reality he or she experiences. Second, by teaching that objects (people, events, and ideas) are unconditional, one surely hopes to accomplish several things simultaneously: to teach function, to enable communication, and to establish stability. The object may be used and it may be discussed. However, by giving information in an absolute way one encourages its mindless use. It would seem then that a choice exists between mindful insecurity and mindless security. Philosopher Charles Peirce maintains that doubt is an unpleasant experience "from which we struggle to free ourselves and pass into the state of belief" (Hartshorne & Weiss, 1965, p. 230). However, if, as we believe, the world (objects, people, and ideas) is always changing, the security that purportedly is created for the person who is taught absolutely may be illusory. Furthermore, clinicians, personality theorists, and social psychologists studying the self (cf. Coopersmith, 1967; Dollard & Miller, 1950; Erikson, 1964; Freud, 1949; Seligman, 1975) would all be likely to agree that, despite this dominant form of education, most people in general do not feel that secure.

Along these same lines, children are taught to think of the world unconditionally to reduce the blooming, buzzing confusion they are supposed to experience (James, 1950). Although we still need evidence, there may be enough stability in learning a "could be" world if the child is also encouraged to treat the world as if it were X when he or she needs X. Some people speak of the importance of teaching children shades of gray. This is not the same thing. If shades of gray are taught unconditionally they are really only blacks and whites called by a different name. Teaching a conditional world, however, may result in the cognitive flexibility implied by shades of gray.

Finally, even after recognizing that one may respond to the world mindfully or mindlessly, one may still choose to teach absolutes because a mindless and mindful response are sometimes (superficially) the same and, if so, the mindless response may be executed faster. Nevertheless, to respond mindlessly would seem to be a better way to process the world only if two conditions were met: (a) the current response was the best response to make in the situation and (b) the situation does not change. It may not be worthwhile to mindlessly hold the world constant if all the time it continues to change.

Conditional learning may be mediated by the absence of categorical reasoning, "incomplete" bottom-up processing, or some yet to be determined mechanism. For the moment, however, we can conclude on a more macro level that conditional instruction enables mindfulness. Of course, at this stage in the research endeavor one cannot know the effect of teaching everything conditionally. The point of our research is simply to suggest that the cost of not knowing may be high.

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Appendix

Model

Our experiments were modeled in terms of the probabilities of an individual subject giving a correct response conditional on the experimental situation and whether he or she had satisfied a first need. In addition, the model allowed for a probability of getting a cue associated with the experimental condition. The following notation was used:

pic = probability of correct response given that the subject is in the conditional experimental condition; pia = probability of correct response given that the subject is in the absolute unknown experimental condition; piu = probability of correct response given that the subject is in the unconditional experimental condition; and piz = probability that the subject understood the cue that would place him or her in the conditional or absolute unknown situation (if the subject did not understand the cue he or she would respond as if in the unconditional situation).

We derive the following probability model:

	11	10	01	00
Conditional	$piz*(pic)^2 + (1 - piz)(piu)^2$	$piz(pic)(1 - pic) + (1 - piz)piu(1 - piu)$	$piz(pic)(1 - pic) + (1 - piz)piu(1 - piu)$	$piz(1 - pic)^2 + (-piz)(1 - piu)^2$
Absolute unknown	$piz*pia*pic + (1 - piz)(piu)^2$	$piz(pic)(1 - pia) + (1 - piz)(piu)(1 - piu)$	$piz(pic)(1 - pic) + (1 - piz)(piu)(1 - piu)$	$piz(1 - pic)^2 + (1 - piz)(1 - piu)^2$
Unconditional	$(piu)^2$	$piu(1 - piu)$	$piu(1 - piu)$	$(1 - piu)^2$

where

11 = correct response to first need and correct response to second need; 10 = correct response to first need and incorrect response to second need; 01 = incorrect response to first need and correct response to second need; and 00 = incorrect response to first need and incorrect response to second need.

Estimation

The parameters in the model were estimated by maximum likelihood assuming a multinomial distribution on the outcomes for each experimental condition (i.e., the rows of the preceding table). The estimates of the parameters were:

pic = 0.940; pia = 0.509; piu = 0.225; and piz = 0.506.

The estimated probabilities were:

	11	10	01	00
Conditional	.472	.115	.115	.299
Absolute unknown	.267	.320	.115	.299
Unconditional	.050	.174	.174	.6013

An approximate (asymptotic) covariance matrix for these estimated parameters is given by the second derivative of the log likelihood function:

	pic	pia	piu	piz
pic	0.0149	0.002	0.004	−0.014
pia	0.002	0.035	0.001	−0.005

piu	0.004	0.001	0.004	−0.006
piz	−0.014	−0.005	−0.006	0.024

Hypothesis Testing

Hypothesis 1: pic > pia

If we take the difference in the estimated parameters: pic − pia = 0.4133 and the associated standard error of the difference from the preceding matrix, 0.2136, an approximate (normal) one-sided nonsimultaneous p value for this hypothesis is $p = 0.02173$ ($z = 2.019$).

Hypothesis : pia > piu

If we take the difference in the estimated parameters: pia − piu = 0.2842 and the associated standard error of the difference from the matrix, 0.1933, an approximate (normal) one-sided nonsimultaneous p value for this hypothesis is $p = 0.07068$ ($z = 1.471$).

Received October 4, 1985
Revision received December 10, 1986
Accepted December 12, 1986 ■