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Mood Is a Component of Mental Context: Comment on Eich (1995)

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E. Eich (1995) found that participants' ratings of the similarity of their feelings at input and test sessions predicted the size of the observed place dependent memory effect and that a mood manipulation affected recall more than did a place manipulation. He concluded that mood dependence is the underlying cause of place dependence (and possibly of drug-state dependent memory). This conclusion assumes that mood states are transsituationally identical and that a mood can cue all associated memories, regardless of how the mood is achieved. An alternative explanation of Eich's results, the mental context hypothesis, views mood, place, mental set, and other factors as components of one's mental context, any of which can serve to cue the representation of mental context at test. In this light, Eich's results can be interpreted as showing that mood is a more reliable determinant than place of one's mental context.

Eich's (1995) studies add to an understanding of the effects of incidental background environments on recall by showing that contextual change may have a dissociative effect on recall only when such change is accompanied by an alteration of the participant's mood. Although he notes that other factors may also play a role in context dependency, he has focused on the importance of mood in predicting and explaining place dependent remembering and forgetting.

Eich interpreted his results as support for the mood mediation hypothesis; that is, the place dependent forgetting observed in his experiments (and, by extension, other reported studies as well) was caused by mood changes. This interpretation suggests that events become associated in memory with mood states but not with incidental environmental contexts. If an environment happens to induce the same mood at test as at input, and if that mood differs from the one induced by a comparison test environment, then the place dependent memory observed is actually caused by associations between moods and events rather than by associations between representations of the environment and events.

Logically, such a conclusion is consistent with Eich's results. It should be noted, however, that in Eich's study mood was primarily measured rather than manipulated. The evidence from his first two experiments is exclusively correlational. The strongest conclusion that can be made about the mood mediation hypothesis, based on the first two studies, is that it could be true but that alternative explanations are also possible.

Eich's only independent manipulation of mood and place occurred in Experiment 3, which unfortunately was flawed due to a lack of counterbalancing of learning contexts. It is possible that recall was worse in the mismatched-mood test condition because of the sad test music rather than because of the mismatched moods. Therefore, alternative interpretations of the relationship between subjective mood similarity and recall level cannot be clearly rejected.

One interpretation that Eich's results cannot reject is what I call the *mental context hypothesis*, a term that derives from a number of sources (Bower, 1972; Kintsch, 1974; McGeoch, 1942; Tulving, 1983) and refers to a representation of a participant's context. The mental context hypothesis states that many incidental events (components of the mental context) are represented in memory in association with the focal experimental stimuli. Included in the mental context are not only representations of mood and ambient environments but the participant's mental set, physiological events, active memories, and other incidental factors. For example, in his description of a participant's encoding context, Bower (1972) included

> internal factors like posture, temperature, room and apparatus cues, and stray noises, as well as internal physiological stimuli such as a dry throat, pounding heartbeat, stomach gurgles, nausea, and boredom. But more significant than any of these is what the subject is thinking about, what his mental set is, at the time the experimental stimulus intrudes. (p. 93)

A representation of the mental context of an episode can contain all of these types of information and, theoretically, can be evoked by any of the components. Thus, in Eich's experiments, a mood or an environment could have cued a representation of the mental context of the original event. Even if the mood manipulation in Experiment 3 of Eich's study truly caused the observed results, a mental context interpretation cannot be ruled out. Such results can be interpreted to mean that mood is a stronger determinant than environment of one's mental context rather than interpreted to mean that mood is the sole incidental associate of focal events.

The conclusion that the experimentally manipulated environment is an unreliable determinant of one's mental context is consistent with the finding that participants are able to manipulate their mental representations of environments (Smith, 1979, 1984). An incidental environment can

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be included in one's current mental context by default if one has no reason to retrieve representations of other environments, as evidenced by the reliable effects of environment that occur when indirect memory measures are used; in these tests, participants have no reason to intentionally reinstate their input environments (Smith, Heath, & Vela, 1990). When instructed to do so, however, participants can mentally reinstate their nonambient input environments and use retrieved context cues to help them remember events that occurred there (Smith, 1979, 1984). Given that participants in Eich's (1995) experiments were told when they were recruited that the study was "aimed at exploring the effects of various campus environments on various cognitive processes, such as those involved in recollecting events of the personal past" (p. 297), it seems reasonable to suppose that, at test, some participants may have tried to mentally reinstate the event generation contexts, thereby diminishing the effects of environmental manipulations.

Interpreted in terms of the mental context hypothesis, Eich's results indicate that the mood reports that he used, such as the judged similarity of the test and event generation (input) mood states, are reliable assessments of mental contexts. It is not clear what information participants used to make these judgments. One source could have been the relative success of event recall, a task that participants had completed just before making their similarity judgments. Basing similarity judgments on the event recall test would be consistent with Koriat's accessibility hypothesis, which states that metacognitive reports are determined on the basis of retrieval of associated material (Koriat, 1993, 1994). It also seems reasonable that the degree to which Eich's participants were able to mentally reinstate the input context could have determined, to some degree, their ratings of the similarity of their feelings at input and test.

Eich's mood mediation hypothesis implies that the participant's mood when memory is tested should cue not only experimental events but all other events previously experienced in that mood. For example, in Eich's Experiment 3 the sad mood induced at test by music was assumed to be the same sad mood induced by the input (event generation) environment, which was associated with the target events. The assumption that moods are transsituationally identical resembles a similar assumption once made by generation-recognition memory models, that once a node representing a word has been accessed, all of the information associated with that node should become available (Kintsch, 1974). This transsituational identity assumption has been considerably weakened by encoding specificity research.

A related concern with the assumption that moods are transsituationally identical is raised by the question of how many different moods people can experience. Bower (1992) noted that mood states are nonspecific (e.g., happy–sad–anxious or energetic–lethargic), suggesting that there are relatively few discrete mood states. If so, each of the few basic mood states that people experience should become so overloaded as cues (e.g., Watkins & Watkins, 1975) that they cannot function as effective cues for any specific memories. That is, so many experiences would be associated with each mood that a mood state could not differentially cue one specific memory or another. The mental context hypothesis has no such difficulty with cue overload effects because it characterizes mood as only one component of the mental context. Other components represented in the mental context serve to differentiate and cue memories associated with the same mood.

In summary, Eich's results indicate that place or environment manipulations are more likely to affect memory if the environments instill different moods. This suggests that people may be more bound by their moods than by their environmental surroundings. The results do not show, however, that mood dependent memory is the underlying cause of place dependence, because the results are equally compatible with the mental context hypothesis, which states that mood is but one of many potential determinants of the mental contexts that become associated with episodes.

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