

Mood-Based Processing of Unfamiliar Tunes Increases Recognition Accuracy in ‘Remember’ Responses

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ABSTRACT

Background

In this research, we looked at the *levels-of-processing effect* both from a transfer-appropriate-processing perspective (e.g., Blaxton, 1989) as well as from a distinctive vs. relational processing perspective (Mantylä, 1997; Rajaram & Geraci, 2000). The levels-of-processing effect (Craik & Lockhart, 1972) in memory refers to the robust finding that materials processed with respect to their conceptual characteristics are much better remembered than materials processed with respect to their perceptual/physical characteristics.

This effect has been shown to occur with both familiar and unfamiliar, as well as with verbal and nonverbal materials, such as faces (e.g., Bower & Karlin, 1974), pictures (e.g., Gardiner, Gregg, & Karayianni, 2006; Marks, 1991), and voices (e.g., Church & Schacter, 1994), in any type of explicit memory test, ranging from free recall to recognition memory. Yet, so far just one study has shown such an effect with familiar musical material (Peretz, Gaudreau, & Bonnel, 1998). Warker & Halpern (2005) and Halpern & Müllensiefen (2008) tried to find a levels-of-processing effect with unfamiliar music but were not able to do so.

Levels-of-processing manipulations are known to influence “remember” type responses more than “know” type responses (cf. Gardiner, 1988). This distinction was first introduced by Tulving (1985) who described two different subjective states when retrieving memories, one, in which the person not only retrieves the material itself but also has an accompanying recollection of the moment of encounter of that material (“remember”), and one, in which this additional recollection is missing (“know”). In a recent study (Mungan, Peynircioğlu, & Halpern, 2011), we were able to show a levels-of-processing effect with familiar tunes and with finer measures of recognition memory, but only in “remember” responses, not in recognition memory in general.

Aims

The aim of Experiment 1 was to see whether we could find a similar levels-of-processing effect on “remember” responses with unfamiliar tunes. As such, Experiment 1 is the first study to look at the effects of a variety of conceptual versus perceptual processing tasks on “remember”/“know” responses in recognition memory for unfamiliar music.

The aim of Experiment 2 was to select the encoding tasks not in terms of conceptual versus perceptual processing but in terms of distinctive versus relational processing. We were curious to see whether the levels-of-processing effect on “remember” responses we had found earlier (Mungan,

Peynircioğlu, & Halpern, 2011) might have been due to processing items more distinctively with the conceptual tasks, especially, with the mood task. By using two conceptual tasks that differed only with respect to whether they required more distinctive or more relational processing, we aimed to find the “smallest unit” of processing necessary for the levels-of-processing effect to occur with familiar tunes.

Experiment 1

Method

Participants. A total of 32 nonmusicians served as participants. All had had less than 1 yr of musical training and could not read music. To be eligible, participants had to pass a transposition test, in which they had to differentiate between a minor and a major triad interval.

Materials. A total of 48 musical excerpts rated as low in familiarity in an earlier pilot study were used. Excerpts averaged about 10.9 s with a range from 7 to 15 s and the lures and targets were of similar duration on average. For counterbalancing purposes, there were two study lists (A and B), each with 24 excerpts, and one common recognition test with all 48 excerpts. All excerpts were played on a YAMAHA S03 keyboard, recorded as MIDI files in Piano timbre, and transformed into .wav files. The interstimulus intervals (ISI) between excerpts in both study and test lists were 4 s.

Procedure & Design. Participants listened to 24 nonfamiliar tunes during study. In conceptual tasks, they judged the mood of the tune (“mood judgment”) or they continued the tune in their minds by 2-3 notes (“continuation”). In perceptual tasks, they traced the ups and downs in pitch (“contour tracing”), or they counted long notes (“counting”). On a subsequent 48-melody free-choice recognition test, in which a random half of the tunes were tunes they had listened to during study (‘targets’) and the remaining ones were not (‘lures’), participants had to mark all targets and provide additional “remember”, “know” and “guess” responses.

The overall design was a two-factor 4 (OT: mood, continuation, contour, counting) x 3 (response type: remember, know, guess) within-participants design. The dependent measure was recognition sensitivity (d').

Results

We found an overall OT effect on “remember” ($F(3, 93)=3.68$, $MSE=.81$, $p<.05$) but not “know” type recognition sensitivity scores. The mood task led to the highest degree of “remember” sensitivity ($d'=1.33$).

Conclusions

In line with our 2011 study with familiar tunes (Mungan, Peynircioğlu, & Halpern), we found that conceptual tasks led

to higher “remember” sensitivity than perceptual ones. And again, the mood judgment task seemed to be responsible for this effect.

Experiment 2

Method

Participants. A total of 36 nonmusicians participated.

Materials. Forty-eight musical excerpts rated as high in familiarity in an earlier pilot study were used. Excerpts averaged about 11.3 s with a range from 7 to 21 s. Materials were otherwise similar to those in Experiment 1.

Procedure & Design. Participants listened to 24 familiar tunes during study. For some, they judged how distinctive the tune was compared to the ones they knew (“distinctiveness task”), for some, they marked the musical category of the tune (“relational task”), and for some they simply marked the perceived loudness of the tune (“neutral task”). Again, a subsequent 48-melody free-choice recognition test followed in which they had to mark all targets and provide additional “remember”, “know” and “guess” responses.

The overall design was a two-factor 3 (OT: distinctive, relational, and neutral task) x 3 (response type: remember, know, guess) within-participants design. The dependent measure was recognition sensitivity (d').

Results

We found a marginal overall OT effect on “remember” recognition sensitivity scores, showing that the neutral task led to the lowest d' rates. To our surprise, we found an OT effect on “know” sensitivities as well. Post hoc tests revealed that the neutral task produced considerably lower d' values than the distinctiveness task.

Conclusions

We were not able to find a differential levels-of-processing effect in a distinctiveness-based task as opposed to a relation-based task of processing. It appeared that the ‘conceptualness’ per se of a processing task was a better predictor for subsequent “remember” sensitivity.

Keywords

Music recognition; familiarity; levels-of-processing; transfer-appropriate-processing; distinctiveness; remember-know responses;

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