Develeopmental patterns in priming and familiarity in explicit recollection

Rebecca L. Billingsley, Mary Lou Smith, Mary Pat McAndrews

2nd journal club meeting
What is the relationship between implicit and explicit memory development?
Task

category generation
  study: oral completion of sentence frames, like “A S----- CATCHES BUGS IN ITS WEB”
  implicit test: report any first 4 words that come to mind for 12 categories
  explicit test: recall studied words cued by one of 6 categories

picture identification
  study: name target pictures
  implicit test: flashing of target picture below visual threshold (increasing) until identification
  explicit test: forced choice recognition of studied pictures between remember, know and guess
Results

category generation

- implicit

picture identification

- implicit

- explicit

- explicit
Levels of awareness and strategies

Analysis of spontaneously reported strategy by age group using a chi-square test for trend was not significant, \( \chi^2(3) = 3.6, p > .30 \). As is documented in Table 2, no correlations between strategy use and priming were significant.

Discussion

Equivalent priming was observed across age groups despite the fact that both explicit memory performance and awareness of a possible relationship between study items and the implicit tasks was greater in older children and adolescents. The lack of age differences on the picture identification test is consistent with several reports showing similar levels of perceptual priming in adults and children as young as and younger than those tested here (Hayes & Hennessy, 1996; Naito, 1990; Russo et al., 1995). The more important finding of Part A is the similar performance of the youngest and older groups on the category generation priming test. Previous developmental investigations employing category generation tasks (Perez et al., 1998; Perruchet et al., 1995) have involved encoding sessions in which participants viewed target words or pictures. Participants in this study, however, were required to generate words in response to sentence frames during the study session, and they never visually perceived those words prior to the administration of the implicit category generation test. These results therefore provide evidence that conceptual implicit memory for words, independent of the visual characteristics of those words, is invariant from middle childhood, when children begin to master reading skills, to late adolescence.

While the lower age range studied here was higher than in previous studies of implicit category generation, our results may be a stronger test of the dissociation of the development of two distinct forms of memory. Significant differences in conceptual knowledge structure have been observed between preschool (4- and 6-year-olds) and school-age children which may account, at least in part, for the developmental differences in conceptual priming for atypical exemplars reported by Hupbach et al. (1999). By comparing school-age children with adolescents, all of whom were able to generate a criterion number of studied exemplars, we have demonstrated the relative developmental invariance of conceptual implicit memory compared to explicit memory performance. As suggested by Hupbach et al. (1999), future studies of category generation priming with younger children should analyze conceptual knowledge development that may coincide with age-related priming differences on this task. We note, however, that their findings were inconsistent with those of Perez et al. (1998) and Anooshian (1997), who found no age-related differences in conceptual generation priming.

Although no age-related differences in conceptual priming were observed on the category generation test in this study, it is possible that they might be more apparent when comparing encoding conditions. Perez et al. (1998) failed to find any age group differences between deep and shallow encoding on a category generation test, but Komatsu et al. (1996) reported age-related differences in conceptual priming.

Table 1
Percentage of participants in each group spontaneously reporting awareness of the study-test relationship or explicit memory strategies

<table>
<thead>
<tr>
<th>Measure</th>
<th>8-10-year-olds</th>
<th>11-13-year-olds</th>
<th>14-16-year-olds</th>
<th>17-19-year-olds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Awareness</td>
<td>6.7</td>
<td>53.3</td>
<td>80.0</td>
<td>73.3</td>
</tr>
<tr>
<td>Strategy use</td>
<td>6.7</td>
<td>40.0</td>
<td>40.0</td>
<td>26.7</td>
</tr>
</tbody>
</table>

*Note.* Percentages indicate responses to questions about all of the tests included in Parts A and B. For each group, \( n = 13 \).

Table 2
Correlations between priming scores and awareness and strategy use

<table>
<thead>
<tr>
<th>Measure</th>
<th>Part A</th>
<th>Part B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Task</td>
<td></td>
<td>Study condition</td>
</tr>
<tr>
<td>Category generation</td>
<td></td>
<td>Picture identification</td>
</tr>
<tr>
<td>Picture identification</td>
<td></td>
<td>Word identification</td>
</tr>
<tr>
<td>Read Generate Generate + Read</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Awareness</td>
<td>-.12</td>
<td>.07</td>
</tr>
<tr>
<td>Strategy use</td>
<td>.14</td>
<td>-.10</td>
</tr>
</tbody>
</table>

*Note.* Point biserial correlations are indicated for each measure. All \( p \)-values > .10. Awareness indicates spontaneously reported awareness of the study-implicit test relationship.