

ACQUISITION OF MUSICAL VERNACULAR IN CHILDREN, PRE-ADOLESCENTS, AND YOUNG ADULTS

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1. INTRODUCTION

It has been proposed that children are biologically set to learn the languages to which they are exposed during early childhood (Chomsky, 1964; Jackendoff, 1994; Johnson & Newport, 1989; Lenneberg, 1967). Several psychologists and music theorists have pointed to similarities between language and music (Gardner, 1983; Lerdahl & Jackendoff, 1983; Sloboda, 1985). Gordon (1987) has suggested that musicality is fixed by the age of 8 or 9 years. Little research has focussed on the mental ability to acquire musical knowledge. To this end, a research program has been underway to test the notion that, like language grammar, a musical grammar is acquired early in life.

In earlier research, young and older adults were asked to rate familiarity of musical excerpts representative of music popular since 1900 (Cohen et al., 1995). Seniors were more familiar with music popular in the early decades, whereas, young adults were more familiar with music from recent decades. In a subsequent surprise recognition test of those same excerpts, for each age group, recognition memory was superior for more familiar selections. These findings were consistent with the view that the rules of a music 'vernacular' are acquired early in life and music in unfamiliar styles, that violates the original vernacular, is less readily encoded and retained in memory (Cohen, 2001). However, because children were not included in this study, the time frame for acquisition was unclear.

Snow (1993) proposes that the ability to acquire a second language is dependent on the social significance of the language. Therefore, acquisition of the rules of music may occur during adolescence when the social significance of music intensifies. The present study aimed to determine if the period for acquisition of the rules of musical vernacular coincides with (a) the early critical period for language acquisition, or (b) the time during adolescence when popular music is so socially significant.

2. METHOD

2.1 Materials

Six audio tapes, each containing 40 excerpts of popular music from the 10 decades of the 20th century, were

updated from a previous study (Cohen et al., 1995). All selections were vocal arrangements ranging from 11 to 23 sec. Each decade was represented by eight excerpts. Each tape consisted of 4 blocks of 10 selections with a selection from each decade in each block. Four "presentation" tapes were used to measure preference and familiarity and two "test" tapes were used to measure recognition. One presentation tape and one test tape were used during each testing session. Each test tape contained 20 selections from the presentation tape and 20 foils that were not included in the presentation tape. There were 2 new and 2 old excerpts representing each decade.

2.2 Participants

Subjects included 17 students in grades 1 and 2 (6 males, mean age = 7.16 years, $SD = .64$), 47 students in grades 5 and 6 (28 males, mean age = 11.64 years, $SD = .64$) and 31 university students (7 males, mean age = 21.42 years, $SD = 2.16$).

2.3 Procedure

All participants were first exposed to a presentation tape. On a 7-point scale, the children and some of the pre-adolescents rated the excerpts for preference; the remaining pre-adolescents and the young adults rated familiarity. All participants secondly received a surprise recognition task utilizing a test tape. The subjects rated on a 7-point scale how sure they were that the excerpt had been previously presented.

3. RESULTS

3.1 Preference

Mean preference of the excerpts increased with increasing decade, and for all 10 decades but the 90's mean ratings of the youngest group consistently exceeded those of the pre-adolescent group. Results of a mixed-model analysis of variance (ANOVA) with 1 between-groups factor (age group) and 1 within-groups factor (decade) indicated: (1) significantly higher mean preference for the youngest subjects ($M = 4.57$) than for the pre-adolescents ($M = 3.08$), $F(1, 48) = 40.05$, $p < .001$, (2) a significant effect of decade, $F(9, 432) = 49.52$, $p < .001$, and (3) a significant interaction of decade and age group, $F(9, 432) = 5.30$, $p < .001$, attributable to a linear trend, $F(1, 48) = 10.11$, $p < .003$. The flatter function for the young children suggests

that they are more accepting of many styles of music than the pre-adolescent group. However, preference consistently increased with decade of popularity.

3.2 Familiarity

The familiarity ratings of the young adults and pre-adolescents increased with decade and were higher for the young adults. Familiarity ratings were entered into a mixed-model ANOVA. Young adults had significantly higher familiarity ratings ($M = 4.62$) than the pre-adolescents ($M = 3.02$), $F(1,43) = 1306.21$, $p < .001$. Familiarity significantly increased with decade, $F(9,387) = 121.77$, $p < .001$, and the interaction between age group and decade was significant, $F(9, 387) = 6.90$, $p < .001$, attributable to a linear trend, $F(1,43) = 15.64$, $p < .001$, consistent with the greater differentiation by decade of the older subjects.

3.3 Recognition

Mean recognition scores increased with age. Mean recognition scores were entered into a mixed-model ANOVA. Results indicated a significant effect of (1) age group, $F(2,92) = 4051.90$, $p < .001$, (2) decade $F(9, 92) = 4.29$, $p < .001$, and (3) interaction of decade and age group, $F(18, 92) = 3.08$, $p < .001$. Bonferroni multiple comparisons indicated that mean rating scores for all groups were significantly different from each other.

For the foil scores, Bonferroni comparisons indicated that the mean scores of the young adults were significantly different from the two younger groups but the two younger groups were not significantly different from each other. To obtain a bias free measure of discrimination between songs actually heard and foils, the mean recognition and mean foil scores by decade were entered into a d' analysis. The mean d' scores collapsed across decades indicated that discriminability increased with age (Figure 1). A correlation between recognition d' and decade was significant only for young adult's recognition, $r = .81$ ($df = 8$), $p < .01$. For the youngest and the pre-adolescent students memory for excerpts of recent styles was not privileged as it was for young adults.

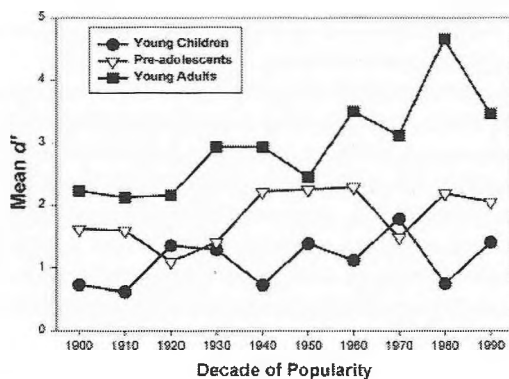


Figure 1. Mean d' for recognition as a function of age group and decade of popularity of the excerpt

4. DISCUSSION

The results that young children show no difference in immediate recognition of music of different styles and are more accepting of different styles of music than pre-adolescents supports the notion of an early critical period for the acquisition of music grammar. The superior memory of young adults for music in recent, familiar styles suggests that acquisition of the rules of the musical vernacular also coincides with the time during adolescence when popular music is socially significant. The results are consistent with the notion of an early period during which music of any style can be retained, as well as, a second period of refinement of sensitivity to a particular style. Such retention forms the basis for developing mental rules representing the musical vernacular to be used throughout life for encoding music, and as the basis of judgments of musical familiarity and preference. Therefore, exposure to many styles of music during the early sensitive period may provide a broad basis for the appreciation of multiple musical idioms throughout life.

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AUTHOR NOTE

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