

EUROPEAN
SOCIETY FOR THE
COGNITIVE SCIENCES
OF
MUSIC

3rd - 3^e I C M P C

International Conference for Music Perception and Cognition
Conférence Internationale pour la Perception et la Cognition musicales

ABSTRACTS - RESUMES

UNIVERSITE DE LIEGE
23-27 July - *Juillet* 1994

INTERACTIVE EFFECTS OF MUSIC AND VISUAL ART

Vladimir J. Konečni
Department of Psychology
University of California at San Diego
La Jolla, California 92093, U S A

The total "message" in many classical, modern, and so-called popular art forms (opera, film, performance art, dance, rock-music videos) is composed of the simultaneous presentation of musical (instrumental, vocal, synthesized) and visual stimuli. That the impact and overall enjoyment of these art forms, at both the local and global levels, should depend on the *interactive* effects of the two classes of aesthetic arrays, is a highly probable expectation held jointly by the creators, performers, and consumers of art (broadly defined). Researchers in psycho-aesthetics, however, for a variety of reasons (including expertise and preference), have generally tended to focus on either auditory or visual stimulus arrays and to study one in isolation of the other.

In this paper, I shall first review a few examples of relevant research from my laboratory on such interactive effects. Also, since I have long advocated (Konečni, 1979, 1982) that the effects of aesthetic messages should be studied in their social, emotional, and cognitive context, I shall allude to some of the findings pertinent to this issue.

Finally, I shall describe a current line of research that combines the two concerns. The ultimate objective of this work is to examine the third-order interaction (in statistical terms): How is the combined effect of music and visual art modulated by the social-emotional context in which the aesthetic experience occurs?

In one condition of a larger experiment, Konečni and Sargent-Pollock (1976) found that subjects who had been exposed to aversive auditory stimulation subsequently shunned complex computer-generated "melodies" (more than 9 bits/tone) when simultaneously required to memorize details of Renaissance masters' paintings, but that this was not the case when the paintings were merely viewed without the memorization instructions (a significant third-order interaction).

In addition to pitch, duration, and timbre, loudness is a major parameter characterizing a tone. The subjects' perceived failure to acquire control over their repeated exposure to an aversive 350-Hz squarewave tone (of up to 4.5 seconds in duration) at 95dB-A led them to rate Renaissance (but not 20th-century non-representational) works as significantly more pleasing than was the case in the various control conditions (again a third-order interaction - Konečni & Sargent-Pollock, 1977).

In a study by Breckler, Allen, and Konečni (1985), using a new forced-choice research paradigm that allowed subjects to choose the sequence and size of the "chunks" of the stimuli (in terms of duration), we found that people -- who had a range of options (in terms of pleasingness and aversiveness) of musical and visual stimuli, respectively, at their disposal -- employed an identical (and rather sophisticated) strategy to optimize mood in the auditory and visual conditions.

Other studies that examined music-related behaviors as varied as preference for rhythmic patterns (in terms of type and complexity: Flath-Becker & Konečni, 1984), preference for computer-generated melodies differing in complexity (Konečni, 1982), and the recognition and reproduction of the central phrase/accompaniment of specially composed fugues (Konečni & Godlieb, 1987) have all found that such behaviors were strongly influenced by the social and emotional context in which they occurred, as well as by the subjects' related personality profiles (e.g., "Type A/B" syndrome).

Figure 1 summarizes the interrelationships among some of the above findings with reference to one important dependent variable, *aesthetic choice*. This heuristically useful diagram depicts

various temporally ordered events that have phenomenological significance for an average art consumer (on a -- literally -- hourly basis), and it contains a feedback loop. Aesthetic choice is placed squarely into the stream of daily life. The theoretical basis for the represented relationships may be traced to Konečni (1982).

In the pilot studies of the present research program (in collaboration with Mitch Karno and Amy Stewart), our subjects (university students, non-connoisseurs) rated excerpts of musical compositions on psycho-aesthetically significant dimensions (pleasingness, interestingness, complexity, abstractness, structure, and the desire to own recordings). To control variability, the music was limited to solo piano pieces by Debussy, Satie, and Scriabin, including, however, a considerable variety of pieces in each composer's opus. Other subjects rated paintings from the Renaissance (modal exemplars from the period) and the 20th Century (abstract works only) on similar dimensions.

Once the paintings from both periods had been classified as being of low, medium, or high complexity, small groups of fresh subjects rated them on scales of pleasingness and interestingness (each slide was shown for 15 sec) while listening to the musical pieces (in 4-min segments) that had also been classified as belonging to one of three complexity levels. Does the complexity of ambient music affect the judgment and enjoyment of a quite different art form?

The judgments of *interestingness* of paintings showed a highly significant, linear, increase as a function of complexity, but this was modulated by the complexity of the concurrent musical compositions: Whereas the ratings of "simple" paintings were entirely unaffected by the complexity of the accompanying music, the interestingness ratings of both the medium and highly complex paintings exhibited a U-shaped function (interaction $p < .02$). The most interesting paintings of all to subjects were the highly complex ones viewed in the presence of the most complex music ($M = 141$ on a 200mm scale).

In the case of *pleasingness*, there was only a highly significant main effect of the complexity of paintings, such that the most complex ones were liked the least, with the other two levels statistically indistinguishable.

Interestingness and pleasingness ratings were positively and strongly correlated in eight cells of the 3 X 3 (painting X music complexity levels) matrix (r s between .51 and .81), the exception being the complex-complex cell ($r = .17$) -- precisely the one in which the highest interestingness ratings were obtained.

The study thus clearly established that the effect of the complexity of paintings interacts with the complexity of the concurrent music, at least with regard to the paintings' judged interestingness.

The intriguing differences between the two rating dimensions made it particularly important to explore the combined effects of music and visual art in a social-emotional context. Also, the ecological validity of the judgment findings would increase considerably if subjects were placed in an experimental situation that gave rise, in a controlled, standardized manner, to emotions that at least mimicked those experienced in real life -- the seemingly reasonable conjecture being that average people's daily exposure to both music and visual aesthetic stimuli is often preceded or accompanied by socially-induced moods or emotions.

Therefore, in the first phase of a complicated experiment (with Amy Stewart) that has just been completed, 12 subjects were randomly assigned to each of three emotion-inducing conditions: 1. Positive Excitation; 2. Neutral-Mood Control; and 3. Social Challenge. All 36 subjects were seen individually; treatments were administered by two female experimenters. In the neutral condition, subjects counted backward by 3s from 100, neither praised nor molested in any way. In the Positive Excitation condition, they counted backward by 7s (a more difficult task), but were lavishly,

generously, and convincingly praised throughout, in a standardized manner. (In pilot testing, this procedure had been found to improve the subjects' mood to a significant degree.) Finally, in the Social Challenge condition (Flath-Becker & Konečni, 1984), subjects were constantly, but convincingly, harassed and reprimanded for being slow and inaccurate, arbitrarily told to repeat parts of the string of numbers, etc. This procedure is rather stressful for the unsuspecting subjects and results in considerable resentment, if not outright anger, on their part.

After undergoing one of the three procedures of differential emotion-induction, all subjects rated the interestingness and pleasingness of paintings of different complexity while listening to excerpts of piano compositions of different complexity. Except for the fact that the subjects were treated individually, this phase was identical to the previously described study.

The design of this experiment thus allowed that the intricate third-order interaction effects on aesthetic preference, involving music, visual art, and emotional context (including *lingering* emotions), be examined in detail. Too much detail, perhaps, because the results are still being coded and analyzed at the time of this writing (an addendum to this paper will be made available in Liège at the conference).

References

- Breckler, S. J., Allen, R. B., & Konečni, V. J. (1985) Mood-optimizing strategies in aesthetic-choice behavior. *Music Perception*, 2, 459-470.
- Flath-Becker, S., & Konečni, V. J. (1984) Der Einfluss von Stress auf die Vorlieben fuer Musik (The effect of stress on music preference). *Musik Psychologie, Jahrbuch der Deutschen Gesellschaft fuer Musikpsychologie*, 7, 23-52.
- Konečni, V. J. (1979) Determinants of aesthetic preference and effects of exposure to aesthetic stimuli: Social, emotional and cognitive factors. In B. A. Maher (Ed.), *Progress in experimental personality research* (Vol. 9), New York: Academic Press.
- Konečni, V. J. (1982) Social interaction and musical preference. In D. Deutsch (Ed.), *The psychology of music*. New York: Academic Press.
- Konečni, V. J. & Gotlieb, H. (1987) Type A/Type B personality syndrome, attention, and music processing. In R. Spintge and R. Droh (Eds.), *Music in Medicine/Musik in der Medizin*. Berlin: Springer-Verlag.
- Konečni, V. J. & Sargent-Pollock, D. (1976) Choice between melodies differing in complexity under divided-attention conditions. *Journal of Experimental Psychology: Human Perception and Performance*, 2, 347-356.
- Konečni, V. J. & Sargent-Pollock, D. (1977) Arousal, positive and negative affect, and preference for Renaissance and 20th-Century paintings. *Motivation and Emotion*, 1, 75-93.

