

## Editorial

PSYCHOLOGY contributes to the understanding of music by characterizing the processing mechanisms of the listener. Some music theorists have expressed concern that findings from psychology might be taken as a basis for arguing what music *ought* to be. Much work in perceptual and cognitive psychology has to do with determining limits: limits to the amount of information that can be retained, limits of discriminability; and so on. If such scientifically established limits were taken too seriously, it is feared, this might serve to stultify musical development by creating artificial boundary conditions for acceptable music. For the limits found in such experiments might not in fact be fixed, but might rather be a function of the type of music to which the listener has been exposed.

To place this concern in historical perspective, the development of Western music may be viewed as a constant struggle between innovative composers on the one hand and establishment critics on the other, who have argued against various innovations on the grounds that they are unacceptable to the listener. Some examples of “new” music that were considered unacceptable would surprise a modern audience. For example, J. S. Bach was considered in his time to have “confused the congregation with many peculiar and foreign tunes.” Another composer who was censured by his contemporaries was Monteverdi. The distinguished music critic and theorist Artusi wrote of his music:

Insofar as it introduced new rules, new modes, and new turns of phrase, these were harsh and little pleasing to the ear, nor could they be otherwise, for as long as they violate the good rules—in part founded by experience, the mother of all things, in part observed by nature, and in part by demonstration—we must believe them to be deformations of the nature and propriety of true harmony, far removed from the object of music.

Yet the works of Bach and of Monteverdi appear to us as outstanding examples of traditional cultivated music. Clearly the way that music affects the listener is at least to some extent a function of experience.

It should be stated that, in the past, arguments against new music have been aesthetic in nature, and were not based on controlled experiments

demonstrating processing limitations. The possibility remains, however, that the typical listener of Monteverdi's time might have produced a different set of functions in the laboratory than those produced by the typical listener of our time. One could plausibly regard the development of Western music as an extensive long-term field study, in which generations of audiences have been exposed to various types of music, and their processing mechanisms have been shaped and reshaped as a result of such exposure. *It is this line of reasoning that has caused some theorists to argue that laboratory studies showing that listeners do not perceive certain musical equivalences provide no argument against the ultimate viability of a system based on such equivalences.*

However, to dismiss the findings of psychology because of such concerns is no solution. *If a music theory is to be scientifically justified, such justification must lie in its relationship to the processing mechanisms of the listener. To take an extreme example, no one would seriously consider composing in a musical system that employs only sounds outside the range of hearing. Central processing limitations are no less real than those of our peripheral hearing apparatus; the only difference is that some are fixed and some are plastic.*

There remains the question of determining which of our musical processing mechanisms can be shaped by experience. To the editor it appears that no clear answer can be obtained by laboratory experimentation. We can expose subjects to intensive training on a given system, and determine whether or not they can learn to use its rules. But negative results would not be conclusive, since it could always be argued that many years of long-term exposure might have produced positive results instead. We can, however, make some inspired guesses as to which processing characteristics are likely to be fixed. Those characteristics which are most useful in making sense of our auditory environment are prime candidates. These include the tendencies to fuse together components of a sound spectrum that are in harmonic relationship, to form sequential configurations on the basis of frequency proximity, to attend on the basis of spatial location; and so on. Such characteristics are likely either to be based on hardwired mechanisms, or if acquired through experience, to continue to be acquired as a result of exposure to our nonmusical auditory environment. Among other candidates for fixed processing characteristics are those that lead to parsimony of encoding, and other measures of encoding efficiency.

In sum, psychological studies cannot, in themselves, provide music with prescriptive answers. However, since music is the product of human processing mechanisms, the characterization of these mechanisms is essential to the understanding of musical phenomena.