

# Unresolved dissonance? Subjectivity in music research

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Psychologists want to know about musical expertise for two reasons. First, expert music performance is one of the highest human accomplishments, combining body knowledge, memory, and creativity in a way that very few other achievements can match. Second, knowledge of how musical expertise develops and how it works in real-time performance could be useful to musicians themselves. To that end, our research group has developed unique methods that integrate the perspectives of researcher and performer. However, researchers and performers tend to have different personal standpoints, ways of thinking, and goals. When psychologists and performers work together to understand musical expertise, these differences need to be addressed and the inevitable conflicts must be resolved.

*Keywords:* subjectivity; research methods; musical expertise; performance cues; musical memory

Psychologists want to know about musical expertise for at least two reasons. First, simply because it is one of the highest human accomplishments, combining body knowledge, memory, and creativity in a way that very few other human achievements can match. Second, because knowledge of how musical expertise develops and how it works in real-time performance could be very useful to musicians themselves.

What do musicians know? A musician's skills are the result of thousands of hours of practice. At least 10,000 hours, by some estimates, are required to perform at an expert level in any domain, be it baseball, chess, medical diagnosis, or figure skating. One problem for the researcher is that by the time the performer has become an expert, much of what she or he does is automatic. So that just asking the expert, "How do you do X?" is unlikely to yield a very useful answer. For example, Rajan Mahadevan earned a place in

the *Guinness Book of Records* by reciting the first 31,811 digits of pi ( $\Pi$ ) from memory. When asked how he did it, he said that he just fixated on each number. When pressed for details, he said that being asked to describe how he memorized number sequences was like being asked to describe how he rode a bicycle. He was sure that he knew how to do both, but found it hard to describe how (Thompson *et al.* 1993). Often, the expert is so familiar with the task that he or she can no longer easily analyze and describe the “building blocks” that the novice needs.

Another problem with asking the experts is that performers may be anxious, defensive, or unaware of what they do. The life of a performing artist is stressful, and performers have been known to engage in superstitious strategies for dealing with anxiety-producing events. Moreover, the performer may not want others to know about this anxiety and these personal strategies. For example, published interviews with master pianists on their memory strategies and problems reveal a variety of conflicting views that probably reflect mixed motives about self-disclosure (Chaffin *et al.* 2002).

Self-report, in the form of interviews and reflection, is not enough. Musicians, when asked straightforwardly, do not always give us the kind of detailed and consistent answers that would satisfy psychological researchers or help other musicians do their work better. Sometimes they can and sometimes they cannot. How then to tell which reports to trust? Our research methods were devised to combine the musical insights of an experienced performer with the objective methods of a cognitive psychologist. The performer’s insights give meaning to the behavioral data of the scientist; the behavioral data tests and validates the performer’s insights.

## MAIN CONTRIBUTION

The method we devised requires individual musicians to record their practice while learning a new piece and then to report all musical features that they thought about as they practiced, every decision that they made about technique, interpretation, musical structure, or performance (Chaffin *et al.* 2002). Figure 1 provides an example from a report of bowing decisions made by cellist Tânia Lisboa (Lisboa *et al.* 2006).

We ask the musicians to report on every aspect of the music that they think is important. Typically, they report decisions about technique, interpretation, performance cues, and musical structure. The reports are made after the piece has been learned, which is typically many weeks or months after practice begins. How do we know whether the musician remem-



Figure 1. Bowing decisions for the *Prelude* from J. S. Bach's *Suite No. 6* for solo cello, reported by cellist Tânia Lisboa who marked places where she had to think about bowing with arrows (highlighted here for better visibility).

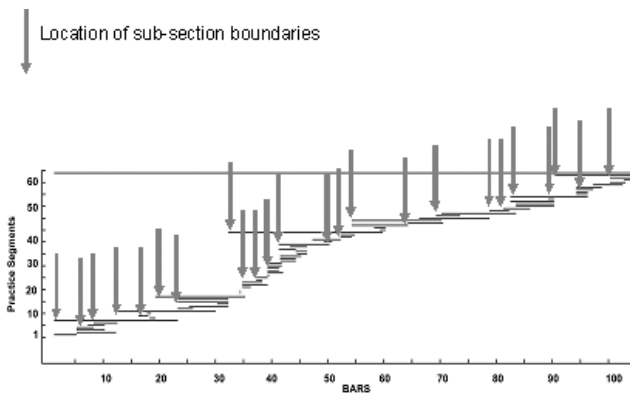


Figure 2. The practice graph showing where the cellist started and stopped reads from bottom to top with each horizontal black line representing continuous playing of the bars shown below. Arrows represent beginnings of sub-sections reported by the cellist.

bers correctly? We compare the reports with what the musician did in practice. Figure 2 shows the practice record for session 15 in the *Prelude* study. The black, horizontal lines record what the cellist *did*. You can see that she was consistently starting and stopping in some places and not others. What was special about these places? The vertical arrows represent what she *said* 20 months later when reporting the location of the subsections of the musical structure. You can see that she was starting and stopping at the subsection boundaries. This correspondence between what she did in practice and what she later reported both validates her report and helps us to understand the behavioral record of what she did in session 15.

You can see that she ended the session by playing through the piece without interruption, her first performance from memory. So we can see that

in preparing to play from memory she was setting up a mental map of the piece in which beginnings of subsections provided the main landmarks.

We call these landmarks *performance cues*. Performance cues provide a mental map that the musician is able to monitor as the music unfolds to keep track of where she is and ensure that critical aspects of the performance go as planned, e.g. a critical fingering or bowing (Chaffin *et al.* 2002, Chaffin and Logan 2006). Performance cues give the musician conscious control of the highly practiced motor sequences which would, otherwise, be entirely automatic. They are created by repeatedly attending to a particular feature of the music during practice so it comes to mind automatically during performance, eliciting from memory the sounds, feelings, thoughts, and actions that have been linked with it during practice. In Figure 2, we see the cellist setting up performance cues for musical structure.

Experienced performers use various types of performance cues to represent the different aspects of the music they have to keep track of: expressive turning points, interpretive gestures, and key points of technique. Performance cues allow the musician to attend to some aspects of the performance while allowing others to be executed automatically. In this way, they allow the performer to remain mindful of a memorized performance that might otherwise become mechanical through extended practice.

Although our methods have proven fruitful, they also create problems of meaning and interpretation. Think for a moment about the subjectivity, the personal identity, core beliefs, and values of a professional pianist and a cognitive psychologist. In terms of personal epistemology, the performer is likely to be somewhat sceptical about scientific methods. He or she is likely to have a great deal of respect for individuality, creativity, and the mystique of art, and to doubt that aesthetics can be measured with the psychologist's methods. As a thinker, the performer may rely on intuition more than logic, especially in the performance realm. The performer desires to be viewed as unique, not like others. The researcher, on the other hand, is likely to be invested in empiricism and to believe in the value of systematic description of behavior from an outsider's perspective. Underlying the researcher's use of quantitative analysis is a belief in lawful regularities in the physical and social world, a faith in the possibility of predicting and understanding human behavior. To that end, the psychologist tends to rely on objective records of behavior and to accept an implicit hierarchy between researcher and subject in which the researcher is higher in status and expertise. In contrast to the performer's desire to be viewed as unique and creative, the researcher's desire is to be viewed as objective and scientific.

When a researcher and a performer join forces, there are also practical considerations based on their different social positions. For the performer, there is little personal payoff for hours spent in research, as opposed to hours spent in repertoire building, performing, teaching, and recording. The performer has no institutional supports for research (office, computers, staff). The performer's income varies based on opportunities for public performance. For the researcher, in contrast, research and publication are the keys to professional stature. He or she is likely to have institutional support and institutional rewards for publishing research. His income is fixed and, once tenured, secure.

Perhaps most important, the goals of the researcher and the performer might differ substantially as they embark on the same project. The first performer we studied, for example, described her goals as follows: to better understand her own process of memorizing for performance, to make her practice time more efficient, to reduce the possibility of memory failure on stage, to improve her teaching, and to pass on the knowledge gained to other pianists. The chief researcher, on the other hand, described his goals as follows: to understand memory expertise in a new domain, to contribute to basic scientific knowledge, and to solidify his professional stature through high-quality research.

## IMPLICATIONS

Our research group has devised novel and fruitful methods for integrating the perspectives of highly skilled musicians with the perspectives of psychological researchers. Nevertheless, these methods bring with them the possibility of miscommunication and the necessity for recognizing the different standpoints of the performer and the researcher. Our research group has found it possible—indeed necessary—to agree on three principles that have kept us grounded and made our work possible despite our differences.

The first is *self-reflexivity*, by which we mean that we engage in a continuous process of reflection on our own assumptions, motives, and epistemological starting points.

The second is *strong objectivity*. We acknowledge that the subjectivity of both the performer and the psychologist inform every aspect of the research. Each member of the research group makes an ongoing effort to understand these effects (both positive and negative) rather than try to hide them behind a rhetoric of scientific objectivity or artistic uniqueness.

Finally, we value *methodological plurality*. We attempt to remain open to all methods, without assuming that any one method is more important or

more valuable than others. The “insider’s” perspective from the performer and the “outsider’s” perspective from the researcher are both essential. The utility of our method lies in comparing and integrating the two.

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