Preface:
Who is Fechner and Why He Still Matters

The publication of *Elemente der Psychophysik* by Gustav Theodor Fechner (1860) not only established the foundations of psychophysics as an area of inquiry but also set the stage for much of experimental psychology. While Fechner is one figure in the lineage of experimental psychology, his contributions set him apart from those that came before and after. Namely, although Fechner was influenced by the work of Ernst Heinrich Weber, the scope of Fechner's psychological research included not only the quantification of physical sensation and perceptual discrimination, but also natural history and consciousness (e.g., Fechner, 1851), evolution (Fechner, 1873), and the experimental study of aesthetics (Fechner, 1876). Yet the contributions of Fechner are not widely known within psychology as a whole (Scheerer, 1987) and we are confronted with the continuing challenge of demonstrating the connections between classic techniques and emerging areas of research.

As Boring (1950) notes, the impact of the publication of *Elemente* often overshadows Fechner's earlier works. Fechner first obtained a medical degree and, starting in 1821, published satirical evaluations of the medical science in his day. With his meagre income supplemented by translating over a dozen chemistry and physics texts, Fechner began to focus his studies on mathematics and physics. At the end of this decade, after becoming interested in the properties of electrical current, he published work on the measurement of direct current. Even at this early stage of his career, we see the physiological and the physical as recurrent themes in Fechner's work yet to be merged into what would later become psychophysics.

The crucial monistic synthesis occurred to Fechner while in bed on October 22, 1850. Mind and body were not dichotomous; they instead represented two aspects of reality. To explore this relationship, he spent the next decade developing the three methods of psychophysics (the methods of limits, constant stimuli, and adjustment) and what he referred to as *Weber's Law*. Though Weber's observations provided the groundwork for a ratio relating changes in intensity of an external stimulus to the changes detected by an individual, Weber himself identified neither the lawful relationship nor its complexity. It was Fechner's methods and theory that sparked investigations by his contemporaries and firmly established the psychophysical approach.

Having published *Elemente*, Fechner (1871) turned his attention to aesthetics, first examining the golden section and preference for rectangles and later culminating in the ill-fated attempt to authenticate two versions of Holbein's *Madonna with Burgomaster Meyer*. Experimental manipulations were clearly not possible, but Fechner reasoned that preference for each could be examined by soliciting the opinions of those who viewed the paintings. Although ultimately unsuccessful due to poor response rates and a biased sample, this attempt marked the beginnings of experimental aesthetics (Boring, 1950; Berlyne, 1971). Fechner (1876) again identified three new methods (the methods of choice, production, and use) and advocated a study of aesthetics "from below" rather than from philosophical principles (c.f., "from above") which culminated in the publication of *Vorschule der Ästhetik*.

Since Fechner's published *Elemente* and *Vorschule*, psychology has advanced into countless areas ranging from the study of complex social phenomena to the interaction of molecules in neuronal communication. Nonetheless, the relevance of psychophysics is still evident today. In this past decade alone, a search of the Web of Science identifies over 3,000 citations containing the term *psychophysics* in areas ranging from robotics and electronics to psychology and neuroscience. The search for a lawful relationship between the intensity of a stimulus and perception still guides the vast majority of research in neuroscience, perception, and cognition as well as many other related areas.

Psychophysical methods still provide the bedrock for experimental psychology with its origins as a "transdisciplinary research program" (p. 1211, Ehrenstein & Ehrenstein, 1999) still echoed in the comparatively recent efforts of cognitive science. In recognizing the significance and longevity of psychophysical theory within experimental psychology, we must also note the challenges presented by an approach developed over 150 years ago. Even though we might laud Fechner's integration of physiology and psychology, the objective and the subjective, we must also be cautious of adopting too narrow a focus. Fechner's approach "from below" represented a radical and necessary challenge to the approaches of his day that emphasized the opacity of personal experience. Nevertheless, we must also allow for the contributions of prior knowledge and top-down processes to the perceptual processes we observe in our controlled experimental settings. In this way, we will avoid relegating the contributions of Fechner and psychophysics to a historical footnote in psychology texts.

As the contributions to this year's Proceedings demonstrate, psychophysical theories and methods are still alive and well. Above all, these papers demonstrate that psychophysics and its history will have a bright future. We must, however, continue to demonstrate the relevance of these techniques to the next generation of psychologists so that they might extend that which Fechner has started.

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