What Comes Before Psychophysics? The Problem of ‘What We Perceive’ and the Phenomenological Exploration of New Effects

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Abstract
The psychophysical methods were developed by Fechner to find out the perceptual threshold of a stimulus, that is, the weakest stimulus that could be perceived. In spite of the strong efficiency in measuring thresholds, psychophysics does not help to define the multiplicity and complexity of possible percepts emerging from the same stimulus conditions, and accordingly, of what we perceive. In order to define what we perceive it is also necessary to define what we can perceive within the multiplicity of possible visual outcomes and how they are reciprocally organized. Usually the main experimental task is aimed at focusing on the specific attribute to be measured: what comes before psychophysics, i.e., the phenomenological exploration, is typically not fully investigated either epistemologically or phenomenally, even if it assumes a basic role in the process of scientific discovery. In this work, the importance of the traditional approach is not denied. Our main purpose is to place the two approaches side by side so that they complement each other: the phenomenological exploration complements the quantitative psychophysical measurement of the qualities that emerge through the preliminary exploration. To demonstrate the basic role played by the phenomenological exploration in complementing the psychophysical investigation we introduce three critical visual conditions, called visual gradient of perceptibility, perceptible invisibility and visual levels of perceptibility. Through these conditions several new illusions are studied and some phenomenological rules are suggested.

Keywords
Gestalt psychology, psychophysics, phenomenology, visual illusions, perceptual organization

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1. From Phenomenology to Psychophysics: The Problem of ‘What We Perceive’

The psychophysical methods were developed by Fechner (1860/1966) to find out the perceptual threshold of a stimulus, that is, the weakest stimulus that could be perceived. They are: the method of adjustment, limits and constant stimuli. These methods investigate the relationship between physical stimuli and correlated percepts: the perceptual effect is measured by systematically varying the properties of a stimulus along one or more physical dimensions.

Before starting any psychophysical measurement it is necessary to define what to measure and, more generally, what we perceive. In spite of the strong efficiency in measuring absolute and difference thresholds, psychophysics does not help to define the multiplicity and complexity of possible percepts emerging from the same stimulus conditions, and accordingly, of what we perceive. In order to define what we perceive it is also necessary to define what we can perceive within the multiplicity of possible visual outcomes, i.e., within a visual gradient of perceptibility, and how they are reciprocally organized. This is what each scientist usually does during the preliminary phase of exploration of a phenomenon though focusing mostly on the main attribute under investigation. This implies that further results related to the same stimulus are not considered or perceived at all even if they might cast new light on the main phenomenon and hypotheses or be much more theoretically interesting and enlightening than the main one. In addition, this preliminary investigation is done without any conventional rule and with little phenomenological attention.

Usually the main experimental task is aimed at focusing on the specific attribute to be measured. What comes before psychophysics is typically not fully investigated either epistemologically or phenomenally, even if it assumes an essential role in the process of scientific discovery. More specifically, ‘what to measure’ is led by experimental hypotheses; however ‘what to measure’ is usually a specific visual phenomenon or a property, which can emerge in its complexity and within the net of possible relations with other phenomena and properties through a good phenomenal exploration.

To demonstrate the basic role played by the phenomenological exploration in complementing the psychophysical investigation we introduce three critical visual conditions, called visual gradient of perceptibility, perceptible invisibility and visual levels of perceptibility. On the basis of these conditions, several new illusions are also studied and some phenomenological rules are suggested.

This work does not deny the importance of the traditional approach and is not in contrast to the current psychophysical tradition, which is deemed to be Fechner’s legacy; what we propose is a deeper and more systematic scientific attention to the phenomenological exploration. Phenomenological exploration and psychophysics are not here considered as alternatives, one for the other — alternative views are suggested instead by other authors (Bozzi, 1989, 1990; Kanizsa, 1980, 1991; Masin, 1993; Massironi, 1998; Metzger, 1941; Thinès, 1977; Vicario, 2001, 2005), who introduced the epistemological idea of a science of percepts iuxta propria principia.