Comment

Contents

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Psychologists' Belief in Visual Emission

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In their article "Fundamentally Misunderstanding Visual Perception: Adults' Belief in Visual Emissions," Winer, Cottrell, Gregg, Fournier, and Bica (June/July 2002) repeatedly expressed their profound sense of disturbance regarding perceptual misconceptions present among college students (pp. 418, 420). I suggest that the visual emission phenomenon (VEP) studied by Winer et al. might not be as widespread and disconcerting as portrayed in the article. Issues 1 and 2, below, dealing with possible ambiguities in the visual emission paradigm, may relieve the threat of an increasingly ignorant college graduate population revealed by a belief in visual emissions.

Winer et al. (2002) suggested that a line of animated dots moving from the eye of a human profile toward a green box (depicted on a computer screen) indicates visual emission. Likewise, they assumed that the paper-and-pencil version (an arrow drawn from an eye to an object) expresses the same notion, also referred to as extramission (Winer et al., 2002, p. 419).

Issue 1: Logic Inconsistency in the Visual Representation of Visual Emission

If a trajectory coming from the eye toward an object indicates visual emission, then the reverse direction indicates emission from the object. This assertion is incorrect because the object, unless it is itself a source of illumination, does not emit light but reflects it. The direction signifying object emission, however, was considered the correct response by Winer et al. (2002), who undoubtedly interpreted it as object reflection. On the other hand, if the presence of overall illumination is assumed, then, indeed, the trajectory from the object to the eye is an instance of reflection (unless the object emits light). By the same token, the reverse (eye to object) must be considered visual (retinal) reflection rather than visual emission. Ergo, the interpretation of the directional representations chosen by Winer et al. is inconsistent and the resultant terminology potentially misleading. This logic issue is driven by the fact that individuals were observing a representation of a profile and an object. Once an observer identifies with the profile, that is, takes the perspective of the profile, then Issue 2 reveals another possible ambiguity and may warrant consideration.

Issue 2: Cognitive–Linguistic Confound

After a verbal list of answer options, participants were instructed to indicate "which one [option] shows how or why we see" (Winer et al., 2002, p. 419). From my personal experience, I see something because I am looking at it. Despite its flippancy, my response illustrates a cognitive–linguistic confound. Conscious visual perception of an object requires attention, that is, my attention is directed toward the object. The direction of my attention is mirrored by the English language: for example, "I am looking at it; an object is in my line of sight." Consequently, the possibility exists that some participants in visual emission studies view the lines from profiles to objects as representations of attention and/or verbal trajectories rather than visual emissions.

Taking Issues 1 and 2 into consideration, answers to the following questions may illuminate the belief in VEP: How do participants respond when the source of illumination is explicitly taken into consideration? Are emission believers likely to draw light bouncing off the retina and hitting the object? How do participants who choose a visual emission representation explain their choice? How do participants respond when their attentional processes are taken into consideration? Can they be instructed to treat head and/or eye movement separately from the eye–object line? Do they assume the perspective of the profile, or do they remain detached observers?

Regardless of logic, context, instruction, construction, cognition, and attention, perhaps the visual emissions projected by Superman hold the answer. The satirist Kevin Shay (1999) put forth a stunningly psychological reason for visual emission: "It's fun to draw beams coming from his eyes" (¶ 5).

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The Phenomenological Truth of Visual Emissions

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First, Winer, Cottrell, Gregg, Fournier, and Bica (June/July 2002) should be congratulated for their wonderful research on adults' belief in visual emissions. They have outdone themselves by going to almost every length possible to eliminate alternative hypotheses for their thesis that adults, not just preoperational-stage children and premodern philosopher–scientists, truly believe their vision operates by emitting energy from their eyes. Winer et al.'s research utterly convinces even the most skeptical inquirer that adults, even after formal education in the scientific

Vol. 58, No. 6/7, 494–496

understanding of the visual system, typically continue to believe in visual emissions. As an exercise in Popperian falsification (Popper, 1959), their research program is exemplary. On the other hand, it is also exemplary of the limits of scientific falsification. Falsification is not so helpful for arriving at the truth when, all along, one is asking the wrong question.

Winer and colleagues (2002) wished to understand if it was true that educated adults actually adhere to the misconception of the extramission theory of perception. On this explicit question, their research is an undeniable success. However, their larger project was to understand how to rid adults of such a primitive conception of vision through formal education. "It is clear," they exclaimed, "that psychology instructors should counteract extramission ideas in teaching about visual perception" (Winer et al., 2002, p. 423). Yet they failed to consider the possibility that, understood from a different angle, the supposed error of adults' belief in visual emissions is not a misconception after all.

To better understand the seemingly errant students, it is necessary to reframe the problem field. Specifically, one must understand that the students were answering a different question than the one Winer and company (2002) thought they were asking. When these researchers asked the students "how or why we see" (Winer et al., 2002, p. 419), they believed they were asking the students how modern physics explains visual perception. Yet the students were answering instead how they experienced visual perception. These are completely different ways of understanding what it means to see.

Winer and colleagues (2002), then, fell prey to a kind of categorical error by which they conflated an objective third-person view of vision (modern physics) with first-person visual experience (phenomenology; Varela & Shear, 1999). From the perspective of modern physics, vision begins when light enters the eye and strikes the retina. From a first-person perspective, however, no one ever experiences vision as light entering the eye (although, at times, one may experience it as being blinded, as when somebody flashes a bright flashlight into one's eyes). Experienced concretely rather than conceived abstractly, vision is truly experienced as an intentional projection from the eyes out onto the panorama of a world (Merleau-Ponty, 1962). As a first-person, phenomenological description of visual experience, the students' answers are right!

If Winer and company (2002) wish to have students disregard their first-person experience of vision, they have set themselves a thankless and impossible task. Yet, if they are concerned with conveying to students a knowledge of modern visual science, then I suggest they begin with teaching students that the scientific view of the world requires setting aside direct, first-person experience to see the world from a particular vantage: a third-person perspective. Recall that for Newton to unweave the rainbow, he had to see in a peculiar way. The task literally required that he turn his back on the everyday way of perceiving light directly, including the context of the world in which the rainbow appears phenomenologically and directly against the backdrop of the natural world. Instead, he entered a dark room with only a single ray of sunlight streaming through the shade. Placing a prism within the beam of light, he witnessed for the first time the spectrum (Romanyshyn, 2001, pp. 30–36).

It should not be forgotten that the difference between the richness of direct perception and the aridity of modern science's view of the world helped give birth to modern psychology. One of the grandfathers of natural science psychology, Gustav Fechner, had a moment of insight as he gazed on the beauty of a natural surround. He wondered at his epiphany that the beauty experienced directly in his perception was not accounted for by the objective, third-person perspective of modern physics. He dreamed of a bridge to fill the gap between subject and object, and he found a provisional answer with Weber's law (Watson, 1978). His answer, in the end, did not solve the problem he set out to resolve, but his wonder at the discrepancy between direct experience and the objective, scientific perspective remains, calling out to psychologists to provide a sensible answer. People live with the gap between how they actually see the world and how science explains the manner in which they do so. Both perspectives are right, one from the perspective of an experiencing person and the other from the perspective of an experiencing scientist examining another experiencing person from the outside. It is this difference that seems to be lost on Winer and colleagues.

The project of teaching students how they see is a job that is best articulated by phenomenology. Phenomenological method explores things "just as they appear" in the "lifeworld" of first-person experience (Gurwitsch, 1966, p. 109). The perceived as perceived is "described solely on its own grounds and merits" (Gurwitsch, 1966, p. 105). Starting from this position, it is possible to understand that students live in a meaningful world first of all, and only secondarily, through concepts learned in formal education, do they learn the importance of the scientific way of seeing. When students learn how the third-person perspective matters and makes a difference in their lives from a first-person perspective, then and only then will they care to learn it.

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Do Adults Believe in Visual Emissions?

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Two readers have questioned our claims (Winer, Cottrell, Gregg, Fournier, & Bica, June/July 2002) that adults believe in emissions from the eye during the act of vision, and both have provided points that may well be true for some participants. Bahr (2003, this issue) pointed out that our computer representations (showing animated visual input and output, essentially consisting of dotted lines moving between the eye and a referent) could contribute to extramission responses. Just as respondents might interpret lines going from the visual referent to the eye as a reflection of light from the referent, so too, they might assume that rays going from the eye to the object are merely reflections off the eye.

Bahr (2003) is correct in noting insufficiencies in our computerized representation