This is an excerpt from a report on the Perceptual Learning and Perceptual Recognition Workshop at the University of York in March of 2012, written by Kevin Connolly, Dylan Bianchi, Craig French, Lana Kuhle, and Andy MacGregor, and available at http://networksensoryresearch.utoronto.ca/Events_%26_Discussion.html

1. What Is Perceptual Learning?

Different speakers at the York workshop defined perceptual learning in different ways (as Fiona Macpherson pointed out during the final panel discussion). Very roughly, Ian McLaren argued that perceptual learning involved gaining a new ability to discriminate. In the final panel discussion, however, some suggested that this might be sufficient but not necessary. For according to some, perceptual learning is exposure that affects subsequent experience. Better discrimination need not follow on changed experience. In what follows, we explain the details of this discussion.

In his workshop talk, McLaren defined perceptual learning as "a type of perceptual expertise that can develop as a consequence of exposure to stimuli that would otherwise be difficult to tell apart." He provided a theory for how perceptual learning occurs. Suppose you are presented with two similar perceptual stimuli (X and Y) the same number of times. Being similar stimuli, many features are shared between X and Y. When a feature is shared, you are exposed to it twice as much as you are a non-shared feature (once when presented with X, and a second time when presented with Y). According to McLaren's theory, you become habituated to these shared features, which results in those features becoming less salient. On the other hand, you are exposed to the non-shared features only half as much as the shared features. So, you become less habituated to the non-shared features. This results in the non-shared features becoming more salient in comparison to the shared features.

McLaren defined perceptual learning in terms of acquiring a new discriminative ability. Fiona Macpherson suggested that McLaren's definition might fall under a broader notion of perceptual learning according to which exposure to stimuli affects our experience in a particular way. On this view, gaining a new discriminative ability would be just one way in which exposure to a stimulus affects our experience, but there might be other ways. Along these same lines, Kevin Connolly pointed to Eleanor Gibson's definition of perceptual learning as "any relatively permanent and consistent change in the perception of a stimulus array, following practice or experience with this array" (1963, p. 29), to which Mohan Matthen noted that Gibson defines perceptual learning not just as learning from perception, but as learning to perceive.

Later on in the workshop, Macpherson offered one reason why defining perceptual learning in terms of exposure affecting one's experience might be too broad. If you stare at a green circle, the edges of the green seem to disappear. That is a case of exposure affecting your experience, but not a case of perceptual learning. In response to Macpherson, Kati Farkas suggested that it is not just exposure, but repeated exposure that makes something a case of perceptual learning. She also pointed out that often the process of perceptual learning involves not just simple exposure, but the use of descriptors. We might learn how to recognize a pinot noir, for instance, because someone tells us which features to look for when tasting or smelling a pinot noir.

References:

Gibson, E. J. (1963) "Perceptual learning." *Annu. Rev. Psychol.* 14, 29–56.