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Logic materialiter. The relevance of psychophysics in Peirce's account of reasoning

It is almost a commonplace in Peirce's scholarship the thesis that Peirce was no psychological thinker, and that he held logic to be the "*art of reasoning*" (1877: "The Fixation of Belief" EP 1, p. 109), i.e., something that must be learned and practiced rather than derived from introspection. However, if reasoning is a critical task that is performed *in the world*, how can a purely formal set of tools be of any help in developing it?

Indeed, Peirce did not provide only a formal account of his logic. More than any other thinker of his time, he realized that statistics and the theory of errors could lead to an objective treatment of perception, and of how we attribute relevance to stimuli. This fact has been acknowledged by Ian Hacking (1988: "Telepathy", *Isis*), who however considers Peirce's reflections on statistics and probability as something separate from his doctrine of pragmatism (2009: "On Not Being a Pragmatist", Misak ed., 32-49). My contribution will show that Peirce's pragmatism and semiotics more broadly owe a lot to his reflections in statistics, which were in turn triggered by his activity at the US Geodetic and Coast Survey and his less known interests in psychology and in psychophysical research (Peirce 1883: "On the flexure of Pendulum Supports", 1885: "On Small Differences in Sensation", both in *Writings*, v. 4: 515-528, v. 5: 122-135).

I argue that Peirce provides the key for a possible distinction between an empirical and historical account of logical inference on one side and a psychologistic one on the other side. While a psychologistic approach has to be rejected, building a connection between the empirical and the logical study of inferences is necessary albeit difficult task: "philosophical sciences and psychology would have each to be built upon the other", Peirce claims. "They must collectively form an arch – or, rather, a Saturn's ring, for an arch has the ground to rest upon." (CN III, p. 128-9). The logic of inference that Peirce develops must therefore be understood in the light of his struggle for "putting logic [...] upon the undeniable footing of science" (1902: "Parts of Carnegie Application", in *New Elem. of Math.*, v. 4: 14). Insofar psychological research is, in Peirce's opinion, an inquiry about human experience, the missing piece of the puzzle is what shall cover the distance from perception to judgment and to scientific inference. I propose that cognitive semiotics can offer the theoretical framework for this enterprise and benefit from its results.