

MAKING SENSE OUT OF *THE SENSORY ORDER*

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ABSTRACT

Purpose – To comment on how The Sensory Order by F. A. Hayek is understood within the context of Hayek's broader research program.

Methodology/approach – Earlier and current perspectives on The Sensory Order are surveyed, quoted extensively, and commented upon. An alternative framework for understanding The Sensory Order is offered and compared to the existing perspectives. Some textual and archival evidence are combined with insights from the history of thought literature to present how Hayek himself may have viewed the role of The Sensory Order in his broader research project.

Findings – Earlier and current perspectives on The Sensory Order are found wanting. The available alternative hypothesis – that Hayek's economics is foundational to his theory of mind – is presented as a more fruitful approach to motivate modern Austrian economics as a progressive research program.

Research limitations/implications – There is limited archival and source material available on this topic and apparently competing versions circulating. Such a discussion has a relatively small and narrow field of interest among scholars intimately familiar with one another's work.

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Originality/value of paper – *If correct, this chapter offers a unique and original perspective on how to perceive the insights from Hayek's The Sensory Order. It also reaffirms the role of methodological pluralism in progressing contemporary political economy.*

INTRODUCTION: THE NEW NEURO-HAYEKIANS

Aside from being one of the most influential economists of the twentieth century, F. A. Hayek was a popularizer of ideas, a knowledgeable historian, a precise etymologist, a legal philosopher, and an innovative theorist of psychology and cognitive neuroscience. A renaissance man, a true scholar, Hayek's research interests stretched throughout the entire corpus of academia and he approached all topics with an intense rigor and thoughtfulness. In no uncertain terms, *The Sensory Order* is a testament to this fact. In his review, R. G. Grenell (1954) wrote "[*The Sensory Order* could] only be successfully carried out by a well trained scientific mind extremely well informed and flexible enough to see clearly across the 'boundaries' between different fields of thought" (p. 409). This chapter offers a comment on recent writings from Hayekian scholars who pay particular attention to Hayek's theories of psychology and neuroscience found within *The Sensory Order*. While we applaud these writers in their calling for more attention to be paid to Hayek, particularly Hayek's less-recognized works, we feel compelled to comment on how Hayek's psychology has been characterized within this literature. Yes, it is important to read Hayek in full in order to digest the complete message of his work (Boettke, 2005; Boettke, Coyne, & Beaulier, 2005), and yes we see a consistent parallel between *The Sensory Order* and the rest of Hayek's writings (Boettke & Subrick, 2002), but it is an overstatement to herald *The Sensory Order* as an essential foundation for Hayek's economics. We do not think that Hayek's own thinking was developed in this manner, nor is such a foundational arrangement essential to understanding Hayek's general theory.

In contrast to earlier theorists such as Machlup (1974), Runde (1988), and Tomlison (1990) who viewed *The Sensory Order* as "separate and different from the rest of Hayek's work," a handful of contemporary scholars have returned to Hayek's psychology and consider it a work of great significance. Gray (1983), Miller (1979), Nadeau (1987), De Vries (1993), Vanberg (1994), Witt (1989), Rizzello (1993), and Cubeddu (1996) all "think the text contains the most coherent, complete and systematic description of all the

methodological aspects used by Hayek” (Rizzello, 1997, p. 24). They emphasize the similarities between *The Sensory Order* and Hayek’s economics, philosophy, and politics rather than the differences. Most recently another generation of Hayek scholars has attempted to flesh out explicit links between Hayek’s cognitive psychology and Austrian capital theory (Mulligan, forthcoming; Horwitz, 2008). Drawing on insights from *The Sensory Order*, Mulligan (2010) characterizes epistemology as an evolutionary adaptation, Horwitz (2010) applies insights from *The Sensory Order* to inform management and organizational theory, and Koppl, Kurzban, and Kobilinsky (2008) have applied Hayekian-inspired epistemic reasoning to analyze forensic procedures.

We prefer the more recent interpretations of *The Sensory Order* (Gray, 1983; Miller, 1979; Nadeau, 1987; De Vries, 1993; Vanberg, 1994; Witt, 1989; Rizzello, 1993; Cubeddu, 1996; Butos & Koppl, 1996; Mulligan, forthcoming, 2010; Horwitz, 2000, 2008, 2010) over the earlier interpretations (Machlup, 1974; Runde, 1988; Tomlison, 1990). *The Sensory Order* is indeed a valuable text in the collection of Hayek’s writings. We believe that there are more similarities between *The Sensory Order* and Hayek’s other writings than there are differences, but we contend that, this is because *The Sensory Order* is a consistent application of (rather than a foundation to) his general theory – institutional rules engender patterned outcomes. As a matter of history of thought, we argue and offer evidence that Hayek *returned* to his original manuscript – drafted as a graduate student (Hayek, 1952a, p. v) – on psychology only *after* he had worked out his vision of the economic problem of society. For Hayek, the central economic problem of society is one of complex coordination of the dispersed and often divergent plans of actors. In short, the analogy of the market as a communication network that enables complex coordination, rather than a unified plan that assures coordination, was worked through first by Hayek in order to explain the economy and then this similar theoretical framework was applied to construct his theory of mind. This framework as to the flow of influence amidst Hayek’s work is preferable to motivate current Hayekians pursuing a progressive research agenda.

We also agree with the new neuro-Hayekian’s that *The Sensory Order* is consistent with and complementary to Hayek’s broader research agenda – philosophy, politics, and economics. If one puts on a pair of Hayekian eyeglasses one will see a great amount of similarities between the structural nature of the economy and the structural nature of the mind – and rightly so. But we fear that some of the phraseology used in the new neuro-Hayekian literature confusingly heralds *The Sensory Order* as a sort of key to unlocking

Hayek's vision of the economy.¹ We invite our readers to entertain the alternative position – it is Hayek's vision of the working economy that is the key to understanding his theoretical psychology.

Our claim can be summarized with a simple thought experiment of constrained optimization. Given the limited opportunity to read either Hayek's psychology or Hayek's economics, which text will offer the motivated reader a clearer picture of the other? Will a Hayekian economist be able to infer the basic gist of Hayekian psychology better (having not read the other) than a Hayekian psychologist will be able to infer the gist of Hayekian economics? We would bet good money on the economist over the psychologist.

Hayek's major contribution to economics elaborated the role of tacit and incomplete knowledge to coordinate the production and distribution of goods and services throughout the economy. Prices serve as road maps, constantly informing actors, and thus promoting coordination along an otherwise unnavigable and infinitely complex route. As Hayek's mentor, Ludwig von Mises argued relative price adjustments in the market economy enable actors to negotiate the "bewildering throng of economic possibilities" and to coordinate the production plans of some with the consumption demands of others (Mises, 1922, p. 101). Without the aid of the relative prices for goods and services established on the market, Mises argued that production decisions within the economy would be reduced to little more than stabs in the dark. The knowledge of what to produce, how to produce it, who should do the producing, as well as who would value the product most highly, all must be generated by exchange then discovered, disseminated, and acted upon within the market process for a complex social order to be realized. Knowledge in a modern economy is overwhelming. We are confronted with numerous possibilities and thus we need to economize on knowledge. Knowledge is often suppressed, dispersed, and incomplete, thus in need of being mobilized in order to coordinate economic plans in a manner that realizes the mutual gains from exchange. Such economizing and mobilization of knowledge creates wealth.

Hayek's description of neuroscience is a parallel application of his general theoretical insight to the applied topic of sensory perception – the functioning of the central nervous system of a human body.² The unifying aspect of Hayek's research is the spontaneous, generative, communicative, and finally coordinative properties of complex adaptive systems. The brain must digest information in a way to simplify data and stimuli that would otherwise be infinitely complex and confusing – in much the same way as prices make calculative decisions digestible in the economy.

In our favor, the parallel interpretation of Hayek's approach is not limited only to economics and neuroscience. Hayek's work on legal systems, culture, history, and ideology all allude to a similar relationship between the theory of institutions, their structural influence, and its many applications. Institutions such as common law, proverbial wisdom, language, and the ideological preference for liberty serve as crude but accurate estimators of "good" decision making within complicated and uncertain contexts.

There is a common pattern to Hayek's ideas. Given that Hayek's theories themselves allude to and explain structural patterns in the mind and the social world, there seems to be a pattern of patterns. But it is the science of economics that is the most thoroughly fleshed out application of Hayek's thought.³ It is economics that offers the clearest application of Hayek's works, and therefore we argue that it is Hayek's economics that should inform his psychology rather than the other way around.

The remainder of this chapter is organized as follows. The next section explains that the interpretation of Hayek's *The Sensory Order* as a critical birthplace to Hayek's economics is plausible but not necessarily true. The third section offers the alternative hypothesis that Hayek's psychology shares a similar methodology to his other areas of applied research. Structural frameworks, guiding principles, and institutional rules bear influence upon the outcomes of the processes that they exist within. The fourth section responds to Butos and Koppl (1996). "Does *The Sensory Order* have a useful economic future?" Not necessarily and certainly not by necessity. Finally, some concluding remarks are presented. Economics is an objective science in which the social theorist must recognize the subjective characteristics of the individuals he studies.

IS *THE SENSORY ORDER* THE KEY TO UNDERSTANDING HAYEK?

Early interpretations viewed *The Sensory Order* as an aside, ancillary to the rest of Hayek's work on philosophy, politics, and economics (Machlup, 1974; Runde, 1988; Tomlison, 1990). For economists first engaging *The Sensory Order*, its contributions were mostly methodological. Vanberg (2004) argues that Hayek's research program, when paying proper attention to the insights of *The Sensory Order*, can be termed "naturalistic subjective" and thus compatible with empiricism. Vanberg uses this point to distinguish Hayek from others within the Austrian School. Vanberg's position is

different from earlier writers on *The Sensory Order* in so far as his is an attempt to recognize the methodological context of Hayek's psychology within his larger research program of human and social science. Horwitz (2000, p. 25) and Butos and Koppl (1996, p. 30) also explain this unique quality of Hayek's work as bridging a methodological gap between Kantian a priorism and Humeian empirical evolution. This recent interpretation of *The Sensory Order* as part and parcel of Hayek's broader research agenda is a preferable portrayal compared to the earlier understandings. *The Sensory Order* is not a fluke digression.

Recent interpretations see *The Sensory Order* as a consistent and important portion of Hayek's corpus. Hayek was foremost an Austrian economist (Caldwell, 2004b), a tradition of social science similar to that elaborated by Max Weber (Boettke & Storr, 2002; Boettke, 1998). To understand human behaviors and social phenomena requires a recognition as to the *meanings* that lay behind actions. Before one can analyze the success or failure, efficiency or wastefulness of an action, he must fit that behavior into a structure of means and ends. Subjectivism plays a major role in Austrian social science because it is a constant reminder as to the cognitive dissonance (1) between the social scientist and the agents in his model, (2) between the agents within the model and other agents within the model, and (3) between policy planners and individuals in society. "Why did he do that?" No one knows for certain, but certainly there must be some reason, some motivation, some purpose. In this tradition there is a welcome seat for Hayek's psychology to fill. Butos and Koppl (1996) are right to point out that *The Sensory Order* is compatible with subjectivism and that it succeeds in demonstrating how there is a consistent structure among individuals' perceptions of reality. How do actors interpret means to relate to ends? How do they judge the success or failure of their actions? *The Sensory Order* shows that diverse individuals share a common structure of perception. "We can understand each other because we have more or less the same mental make up. Hayek's cognitive theory supports an argument against 'polylogism,' the doctrine that different cultures have different logics" (Butos & Koppl, 1996, p. 36).

We see in Hayek's *Sensory Order* a similarly patterned relationship between theory and application as we have seen in his legal philosophy and economics. The mind is a simplifying tool to digest an otherwise infinitely complex reality just as institutions such as the law are coping mechanisms to mitigate risk, uncertainty, and transaction costs. Prices are local and clear yet informed by dispersed and tacitly formed subjective evaluations. For Hayek, the mind perceives incomplete and limited bits of information,

it then fits such information onto a memorial “map” and in doing so the mind maintains a functional and well-operating human body and life.

Our concern is that the most recent revival of Hayek’s neuroscience overuses bold terms to describe the role that Hayek’s theory of psychology plays in relation to the rest of his work. This could be interpreted in two (not necessarily exclusive ways): (1) Hayek perceived *The Sensory Order* as foundational to the rest of his work, or (2) current scholars would be right to view *The Sensory Order* as foundational to the rest of Hayek’s work. We disagree with both and to the extent that the second may rest upon the first critiquing the first weakens the case for the latter. As a result (or perhaps part and parcel) of these perspectives the prominence of *The Sensory Order* within the Hayekian research program we fear has been at times overstated. For example, Vanberg (2004) writes, “these internal representations or models provide *the clue to our understanding* of adaptive or purposive behavior. The fact that these internal models allow the organism to anticipate the likely consequences from different kinds of behavior is... *the essential ingredient of purposive, problem-solving behavior*” (italics are ours, p. 26).

Steve Horwitz (2000) begins his applications of *The Sensory Order* insight with statements that seem compatible to our framework: “Hayek’s arguments for a constitutionally constrained government *are consistent with... his work in theoretical psychology*” (italics are ours, p. 23). Also, he writes – and we agree – “Hayek’s theory of mind *fits into* his economic and social thought. Ultimately, Hayek’s conception of the human mind is that it is a spontaneous order much like the various social and economic phenomena he has explored in other works” (italics are ours, p. 24). Again, in his most recent papers concerning *The Sensory Order*, Horwitz (2008) writes, “It is striking how similar the Austrian theory of capital is to Hayek’s work on cognition... They are... analogous models of complexity... [Hayek’s] work on capital got him thinking about ideas and approaches that led to his later work in the mind and complexity more generally” (p. 145). And Horwitz (2010), “some have argued that [Hayek’s] vision of the mind as spontaneous order was perhaps in some ways always present as a guiding idea for his work in economics... [t]here is another way... [r]ather than mind being central, the concept of spontaneous order was always there” (p. 1).

But in other places, Horwitz appears to award *The Sensory Order* a sort of foundational role to the entire stretch of Hayek’s thinking. Beyond *The Sensory Order* being “consistent with” Hayek’s notion of constitutionally constrained government, his (2000) abstract reads, “Hayek’s arguments for

a constitutionally constrained government are consistent with, *and to some extent rest upon*, his work in theoretical psychology... The Austrian view of the microeconomic coordination *is a logical outgrowth of Hayek's theory of mind*," (italics are ours, p. 23) and further "*The Sensory Order, is crucial to understanding both his economics and his politics*" (italics are ours, *ibid.*). Horwitz (2000) retains this language – "crucial" and "resting-upon" – throughout his article, and their instances outnumber the compatible phrases referenced above. He continues, "the linkage between that theory [of mind] and Hayek's economic and social theories is what constitutes his *true contribution*," (p. 26) and later in the same section, "[t]he limits of explicit human knowledge *form the basis for Hayek's economic and social thought and are the crucial difference between his approach and that of both socialism and modern neoclassical economics*" (italics are ours, p. 27). Later, Horwitz describes Hayek's economic and social research as applications of *The Sensory Order*, "Hayek's emphasis in the 1937 paper [*Economics and Knowledge*] on the interaction between expectations, the market process, and human learning *is the framework of The Sensory Order applied to actors in the economy*" (italics are ours, p. 28). Horwitz concludes that section by stating that Hayek, "*needed to make the case for his epistemological perspective (and its psychological foundation) in order to show where his evolving and developing perspective on political economy was derived from*" (italics are ours, p. 29), though he footnotes Hayek (1952a) as we perceive to be the opposite effect, "it was concern with the logical character of social theory which forced me to reexamine systematically my ideas on theoretical psychology" (p. v). In some places, for Horwitz, Hayek's economics stem from his psychology and also, "Hayek's philosophy of law appears to be another application of his theory of mind," (p. 35) and later "for understanding the argument in *The Road to Serfdom*, *it is not only necessary to understand Hayek's Austrian economics, but also his theory of mind*" (italics are ours, p. 37). Horwitz closes boldly asserting that a progressive Hayekian research program today, "*must begin with a better understanding of the human mind*" (italics are ours, p. 38).

Such a research program has been investigated by Horwitz (2008, 2010) himself. In each piece he attempts to make analogies devoid of implying an influential magnitude from mind to management (forthcoming) or mind to capital structure (2008). "So the question of which set of idea might have been the inspiration for the other, as it seems possible it could go either of both ways" (p. 24). In short we argue that this question is best answered in the opposite direction. The analogy that the mind works like a capital structure or like a complex organizational structure instead of a single

autonomous entity is a more fruitful tool of political economy than the reverse analogies. Perhaps coincidentally, Horwitz (2008) phrases them the other way, "the capital structure as an analogy to the mind" (p. 160). And later, "[m]uch as the biological processes of the brain lead to the emergent phenomena of the mind and consciousness, so do the individual capital-using plans of entrepreneurs get translated via the market into the emergent phenomenon of a more or less integrated capital structure" (p. 162).

In Butos and Koppl (1996), there are both phrasings that we find compatible and conflicting with our framework, but the latter seem to outnumber the former. Compatible: they explain, "Hayek's view of the mind as taxonomic order *follows from* the motivating insight of his theory" (italics are ours, p. 27) and later, "the cognitive problem Hayek sets out to resolve *is identical to* the social problem he has addressed over the years: how do complex phenomena like the mind and markets resolve inherent limitations on knowledge?" (italics are ours, p. 39). But other passages lead us to presume that Butos and Koppl view *The Sensory Order* as foundational to the remainder of Hayek's work. They state clearly that, "economists should let *The Sensory Order* inform their thinking" (italics are ours, p. 20). For Butos and Koppl, "Hayek's theory [of mind] *establishes the cognitive base* for tacit knowledge" (italics are ours, p. 29). They use the same phrasing – *cognitive basis* – again later (p. 37), and refer to *The Sensory Order* as "*the foundation*" of "strong linkages [that] exist between [Hayek's] methodology and his interest in complexly organized adaptive phenomena" (p. 39). Butos and Koppl argue that common misinterpretations of *The Sensory Order* act as a *pons asinorum* – a fool's bridge that "[u]ntil you have crossed... you have not properly entered the field and you cannot yet form opinions on the subject," (p. 29) and state clearly, "[w]e believe that this lacuna (or possibly neglect) within the social sciences is surprising and unwarranted" (p. 25).

Lastly, some passages give hint as to what precisely Butos and Koppl (1996) attribute as the essentially unique contribution of *The Sensory Order*. "While Hayek's treatment of the knowledge problem in the catallactic domain *clearly emphasized the discovery* and use of decentralized knowledge, his treatment in *his cognitive work* [*The Sensory Order*] should be seen as an account of its *generation*" (italics are ours, p. 42). This would seem to imply that Butos and Koppl's appreciation for *The Sensory Order* stems from their interpretation that Hayek's economics and social theory lacked particular attention to the *generation* of knowledge, though they admit an ambiguity here later in their text, "it is not quite obvious why we need this theory to understand market level path-dependence or, more generally, how the

cognitive theory specifically generates a coherent theory of social institutions" (p. 44). They clearly argue for the applicable power of *The Sensory Order* to explain economic and social phenomena, "any theory of the market process *requires* some kind of articulated theory of learning... it seems difficult if not *ad hoc*, to make claims about the conditions under which markets will tend or not tend toward the coordination of individual plans" (italics are ours, p. 45). We do not share in this interpretation that the Hayekian paradigm without *The Sensory Order* lacks attention to knowledge generation, nor are we convinced that Butos and Koppl have adequately identified a uniquely applicable feature of *The Sensory Order* unfulfilled by Hayekian economics, but we will address this more in later sections.

One explanation for why such overemphasis has been placed upon the role of *The Sensory Order* in influencing Hayek's work stems from the history of thought surrounding the writing process, publication, reception, and recollection of the book. Did *The Sensory Order* inform Hayek as current neuro-Hayekians hope it to inform their own work? Horwitz (2000) points out that there was a great change in Hayek's writings from neoclassicism toward more innovative, knowledge-based economics that centered around the early 1930s (*ibid.*, p. 27 and Caldwell, 1988, 2004b). We share Horwitz's (2008) later take – Hayek's epistemic turn and the development of his core theory was most essentially influenced and developed within the context of the socialist calculation debates (Boettke, Schaeffer, & Snow, forthcoming) over the perspective implied from the quotations we selected above.

It is well known, that Hayek wrote a portion of *The Sensory Order* very early in his career, arguably earlier than much of his groundbreaking economics. Hayek says "thirty years earlier" according to the preface of *The Sensory Order* (1952a, p. v). Given that the final book was published in its first edition in 1952 – by this account that places Hayek's writing of the original manuscript around the year 1922 – while Hayek was still in graduate school. Thus, it appears that the dates form a sort of linear progression. If we first admit that Hayek's framework – structure and its influence on ordered outcomes – runs parallel throughout his economics, social theory, legal philosophy, and neuroscience; and second, we admit that his neuroscience was investigated, theorized, and developed before the other topics, then it would be reasonable to conclude that a flow of influence or theoretical foundation exists stemming from *The Sensory Order* onto Hayek's later works. We deny this second point and instead argue that (1) there is insufficient evidence to argue that Hayek fleshed out (what we

consider to be) the essential portion of *The Sensory Order* at this early drafting date and (2) the available evidence points to a flow of influence in the opposite direction – Hayek returned to his underdeveloped manuscript on the topic of psychology after he had developed his framework of complex social phenomena through the lens of rational-choice and rational-action-based economics.

Hayekian biographer and historian of thought Bruce Caldwell was kind enough to supply us a translated copy of the original manuscript that Hayek refers to drafting long before the publication of *The Sensory Order*. It bore the title: “Contributions to a Theory of How Consciousness Develops,” and is dated 1920 – a 36-page, double-spaced Word document in 12-point font with significant page margins and white space. Caldwell (2004b, p. 249) refers to this archival document as “less mature” than the final publication – 232 pages in its current-University of Chicago Press – paperback edition. If so much of *The Sensory Order* was envisioned by Hayek in 1920 then why did its rewriting and revision require such significant time and effort? Also worth noting is the fact that Hayek completed his most formal and technical work on economics, *Prices and Production* for finalized publication in 1931, well before the final manuscript of *The Sensory Order* was ready in 1952.

One could argue that comparing the length of the 1920 manuscript with its final publication is insignificant so long as the core insight of *The Sensory Order* was included in that original manuscript. Hayek seems to imply as much in the final version’s preface, “it [his student manuscript] contains the whole principle of the theory I am now putting forward” (p. 5). On this point we disagree with Hayek and share Caldwell’s perception; the manuscript is significantly “less mature” than the published version. Had the published version more closely resembled the older document, then we would agree more with *The Sensory Order*-as-ancillary perspective (Machlup, 1974; Runde, 1988; Tomlison, 1990). The final publication of *The Sensory Order* contains a more-nuanced version of Hayek’s theory of mind. This final version of the theory contains a crucial element not contained (as best we can decipher) in the original 1920 manuscript.

What is the crucial difference between the 1920 unpublished manuscript and the 1952 version of *The Sensory Order*? In the final publication, Hayek fleshes out the implications of neuroscience when one recognizes the scarcity and constraints of perception. In other words, Hayek applies an economic argument to the topic of neuroscience.⁴

Butos and Koppl (1996) write, “[p]erhaps the key insight of Hayek’s approach [in *The Sensory Order*] is that the set of connections [formed by the central-nervous system] creates a classification over sensory inputs”

(p. 10). Perception is not a mirror of reality. They (p. 13) quote Hayek's (1952a) final publication "we do not first have sensations which are then preserved by memory, but it is as a result of physiological memory that the physiological impulses are converted into sensations" (p. 53). Memory precedes perception. We identify and label this version – perhaps we should say portion – of Hayek's theory of mind as underdeveloped. In some form or another, it is found in both the 1920 and 1952 manuscripts. The closest portrayal Hayek (1920) achieves in the original manuscript (as best we can decipher – the document is dense yet poorly communicated) is as follows: "[w]e are therefore justified in saying that becoming conscious means integrating an impression into a preexisting nexus of meanings, a system of qualities, and it is this process that we shall designate as uptake into consciousness" (p. 4), and later, "[p]hysiological memory, which is based on sensory experiences, is in any case a precursor of this sensation. We have seen how sensation was created by memory... We do not have sensations, which are then stored in our memory; instead, it is only because of memory that physiological stimuli become sensations or other attributes of consciousness" (p. 8). Or as Hayek quotes in 1952 from the 1920 manuscript, "we do not first have sensations which are then preserved by memory, but it is as a result of physiological memory that the physiological impulses are converted into sensations. The connexions between the physiological elements are thus the primary phenomenon which creates the mental phenomena" (Hayek, 1952a, p. 53). In its simplest terms: memory precedes perception.

Several points are worth mentioning that strike against upholding the underdeveloped version of Hayek's theory of mind as the foundation or influential force upon the rest of his research agenda. First, Hayek appears to accredit this insight to others by citing informally in the document, "Wertung or Auffassung" (p. 4), meaning Hayek himself did not take credit for this supposedly unique insight.⁵ Second, Hayek appears to precisely choose the word "meaning," in the above quotation. We interpret this word choice as his attempt to emphasize the primacy of choice over neurological or biological processes. Again this puts Hayek firmly in the Austrian tradition akin to Max Weber and other economists within the Austrian camp (Boettke & Storr, 2002; Boettke, 1998). Third, Hayek's motivations for this paper are clearly stated and narrowly defined. He does not mention that the theory of mind could or should be cross-applied to garner otherwise inaccessible insight into other realms of social science.⁶ Instead, Hayek very specifically targets what he considers to be false psychological perspectives popular at the time. Hayek (1920) writes, "[t]he author's views in this

matter are in the sharpest opposition to the prevalent 'dogmatic-atomistic concept of sensations' and to any concept relying on a primal, clear-cut association of consciousness event and brain process" (p. 1). Hayek wanted to avoid treating perception like a black box of psychic processes, a view he attributes to W. Jerusalem's (1907) textbook, "[w]hen the excitation penetrates as far as the cerebrum, it is converted there, inexplicably into a psychic state, or, in the case of a simple stimulus, into a sensation" (p. 18) (Hayek, 1920, p. 3, fn.1). These are more modest intentions behind Hayek's theory of the mind compared to those found in the later version of *The Sensory Order*. Hayek's student essay was predominantly reactionary. If the central point of the 1920 manuscript is memory precedes perception, we argue that this is a weak point compared to its fuller version in 1952.

What is the fuller-developed insight of *The Sensory Order*? Compare the quotations above and Butos and Koppl's accurate summary with the following from the 1952 published version of *The Sensory Order*:

The more this process leads us away from the immediately given sensory qualities, and the more the elements described in terms of these qualities are replaced by new elements defined in terms of consciously experienced relations, the greater becomes the part of our knowledge which is embodied in the definitions of the elements, and which therefore is necessarily true. At the same time the part of our knowledge which is subject to control by experiences becomes correspondingly smaller. (Hayek, 1952a, p. 170)

Hayek is explaining how different magnitudes of different pieces of cognitive information cause different perceptions and therefore actions. Hayek is explaining the scarcities and abundances – dare we say the relative prices – dare we say the economics of cognition and perception. Butos and Koppl (1996) are right to point out that Hayek's fuller theory of the mind (1952a) emphasizes the "scarcity" conditions under which the mind processes knowledge. The physical logistics of mental processes act as a form of "constraint" upon the amount and type of knowledge accessible to any individual person. Our claim is merely that this is a larger point than memory precedes perception, and that this is an essentially unique point made in the final published version of *The Sensory Order* and not found in its original 1920 manuscript. Second, this is an essentially economic argument – scarcity induces constraints and implies particular strategies are efficient at accomplishing specifically defined goals and objectives. Structure induces particular forms of order. Without this economic core, Hayek's theory of the mind is not cross-applicable to resolve other social issues and it does not seem evident that this core is somehow uniquely dependent upon

neuroscience as its genetic birthplace, certainly not the neuroscience found within Hayek's 1920 student paper.

One is tempted to point out Hayek's comment that he almost became a psychologist rather than an economist (1952a, p. v) as evidence of *The Sensory Order's* foundational role. But Hayek considered pursuing multiple advanced degrees, he obtained a joint degree in law and economics, but did not complete a Ph.D. in psychology, nor did he publish in the field of psychology ever after the publication of *The Sensory Order*. He in fact became an economist and introduces himself as such in the very first sentence of the preface to *The Sensory Order* (Hayek, 1952a, p. v). Furthermore, as Caldwell (2004b) rightly points out, "[h]e would later say that the resulting volume, *The Sensory Order*, was extremely important for understanding his later work. But he never said how or why, and, for that matter, subsequent references to *The Sensory Order* were not particularly prominent" (p. 7) – a peculiar trend for Hayek since he regularly cross-references his research to his other relevant pieces.

Boettke (2005) argues that Hayek's motivation behind *The Sensory Order* was in part the result of the popular success from *The Road to Serfdom*. Such popularizing was and still is looked down upon in the academic profession – unscholarly, unsophisticated, and unscientific (a particular pet peeve for Hayek). Seeking to reestablish his academic identity and reputation, Hayek dedicated himself to *The Sensory Order* as his most intensely theoretical work. Caldwell's (2004a) take is compatible with our interpretation that Hayek sought to attack the proponents of behavioralism and physicalism on their own turf – the physical sciences (pp. 246–248). Again, Hayek's (1952a) preface seems to support this view,

... one of the basic problems of psychology were the result of the prevalence during this period of an all too exclusively empirical approach and of an excessive contempt for 'speculation'. It seems almost as if 'speculation' (which, be it remembered, is merely another word for thinking) had become so discredited among psychologists that it has to be done by outsiders who have no professional reputation to lose. (p. vi)

Thus, one could argue that *The Sensory Order* was a strategic publication for both career and argumentative purposes. But this argument has a particular implication; if *The Sensory Order* is a strategic publication to advance Hayek's career and research program then one must also admit that Hayek possessed a vision of his analytical framework at the time of this strategic action. In other words, Hayek's vision of the spontaneously ordered economy and society predated and sits as foundational to his theory of the mind rather than the other way around.

Despite his own recollection and insistence that the book was one of his most important pieces (*ibid.*, pp. 248–250), by Hayek's own admission he is a bad source of reliable information on his own intellectual history. Caldwell (2004b) refers to Popper biographer Malachi Hacoen (2000) who draws a similar conclusion, "autobiographical accounts are inaccurate," and proceeds to footnote that "Hayek's own psychological work on memory [presumably a reference to *The Sensory Order*] leads us to expect this kind of problem" (p. 6). Just as the mind tends to lump stimuli and information into coherent clusters and categories, one's mind can be prone to fuse memories together. What in reality were separate occurrences – in his honest recollection – sometimes seem more like the same event (Hayek, 1994).

Hayek wrote a significant portion of *The Sensory Order* in the early 1920s, he then saw a strategic opportunity for its elaboration and publication to advance his career and ideas years later after 1944. He then revisited his original manuscript, rewrote it and finally published it in 1952. After its publication he was forced to defend his thesis by reexplaining it against those who failed to grasp its meaning. And lastly, he was asked to reminisce about its value and importance after he had won the Nobel Prize (Hayek, 1994). We argue it was only natural for both him and later scholars to overemphasize its theoretical value given the publication's long and dramatic life cycle.

The overstatement of the link between *The Sensory Order* and the remainder of Hayek's work is a perfectly reasonable conclusion and in fact can be thought of as one such phenomenon like those that Hayek refers to within *The Sensory Order*. Hayek's work is dense and complex, where differences and varieties exist, the interpreters' mind may naturally lump ideas together or construct narratives and connections in order to make sense and award meaning out of the apparent complexity. In some sense, recent Hayek scholars have attributed a false "anthropomorphism" to *The Sensory Order*, much like Hayek warns of in *Law, Legislation and Liberty* (1973, pp. 26–29). It is almost a natural instinct for us to draw stronger connections than what actually exists, potential connections where none exist at all, or infer causal relationships where there are really only correlations. Just as the mind is not a mirror of reality, recent portrayals of *The Sensory Order* are not a mirror of its reality nor the reality of Hayek's intentions for it. We feel compelled to comment on such matters because such overemphasis on the physiological components of Hayek's theory run the risk of portraying Hayek (incorrectly) as scientistic (Hayek, 1952b) and/or functionalist (Gauss, 2006) – the latter Horwitz (2008, p. 146 and p. 151) seems to accept, while Butos and Koppl (1996) walk delicately close to the former.

And lastly we call upon Hayek to offer his own counter-claim at the time of *The Sensory Order's* publication. On what drove him to write book, Hayek (1952a) penned: "it was concern with the logical character of *social theory which forced me to re-examine systematically my ideas on theoretical psychology*" (italics are ours, p. v). Again, Hayek's social theory informed his psychology rather than the other way around.

AN ALTERNATIVE HYPOTHESIS

If the claims (1) that *The Sensory Order* is a foundational text to Hayek's economics and (2) that reading and understanding *The Sensory Order* sheds some otherwise unknown light upon Hayekian economics – are to be strong and valid they must be preferable to a pair of reasonably framed alternative hypotheses. If simpler and more plausible interpretations of *The Sensory Order* are as reasonable or more so than the two listed above then they are in effect weakened. We submit two alternative hypothesis that are in their essence anti-thetical to *The Sensory Order*-as-foundational perspective. (1) Hayek's understanding of economics is foundational to his remaining theories in philosophy, politics, and psychology, and (2) reading Hayek's economics better informs a reader as to the general outline of his theoretical insight than does reading *The Sensory Order*. We believe these alternative and opposing hypotheses to be more reasonable and therefore more likely an accurate portrayal of the theoretical content of *The Sensory Order* and its potential role to guide progressive research.

Hayek's economics, politics, philosophy, and psychology are all consistent applications of his general theory. The outcomes of processes are predictable in so far as the processes contain elements of a universal structure. When first reviewed in the early 1950s, *The Sensory Order* did not receive much attention from economists or social scientists. It was instead reviewed by individuals within its own fields of specialty, philosophy, biology, psychology, etc., but still rarely so. Several reviewers acclaimed its thoroughness and insight, but they often had complaints that it lacked sufficient examples and applications (Sprott, 1954; Boring, 1953; Chisholm, 1954; Kneale, 1954; Grenell, 1954). This could be in part explained if Hayek did not view *The Sensory Order* as a key to unlocking the rest of his work's examples. Instead, if Hayek viewed *The Sensory Order* as we do: another consistent application of the relationship between structure and outcomes. In this light, it would be almost tedious for *The Sensory Order* to contain elaborate empirical support and applied evidence. From this perspective, the

entire text and theoretical exercise of *The Sensory Order* was and is itself an empirical case study that serves as an example to support his more general theory and larger body of research.

Our second counterhypothesis is best argued for by use of a simple thought experiment in marginal value theory. What is the marginal value of reading *The Sensory Order*? We admit that this question presupposes an answer to the question, "value for what?" We define such value as the amount of understanding awarded to the reader by means of a careful analysis. While the marginal value of reading *The Sensory Order* may in fact be relatively high – relative to reading mainstream economics, given the under-recognition of Hayek's work in general – it seems obvious that the marginal value of reading Hayek's works on economics are at least greater than the marginal returns of reading *The Sensory Order*. We find it difficult to accept a perspective of Hayek that would imply a teacher or instructor to have his students read *The Sensory Order* before, for example, *Prices and Production*, *Individualism and Economic Order*, *The Constitution of Liberty*, or *Law, Legislation and Liberty*. While none of the neuro-Hayekians have or presumably would make this explicit claim, we feel the message is worth communicating to current and future Hayek scholars.

DOES THE SENSORY ORDER HAVE A USEFUL ECONOMIC FUTURE?

Butos and Koppl (1996) have argued that *The Sensory Order* has had the misfortune to be both under investigated and often misunderstood. In doing so, we argue that they and Horwitz (2000) have overstated the magnitude of influence that Hayek scholars should garner from *The Sensory Order* and/or award to it. In so far as one values truth for truth's sake, overstatements are problematic because they are misrepresentations of reality, that is, not truth. As Butos and Koppl (1996, p. 34) refer to Khalil (2002) who writes, "the mind is not a mirror of reality" (p. 334). In much the same tone, we argue that the *Sensory Order*-as-foundational presentation of Hayek is also not a symmetric mirroring as to the reality of Hayek's work. We are skeptical that Hayek meant *The Sensory Order* to be what it has been implied it to be, and we are skeptical of the evidence for the argument that one grows a significantly greater understanding of Hayek by reading it.

Surely every piece of scholarship cannot be the foundational or essential element. With the awarding of first-place prizes comes the necessity for

second-place losers. If we are to believe that *The Sensory Order* is the foundation of Hayekian thought, and we are wrong, then we are not only overestimating *The Sensory Order* but we are also underestimating whatever actually is the foundational theory of Hayek's vision.

Now to return to the earlier topic broached by Buto and Koppl (1996), "it is not quite obvious why we need this theory to understand market level path-dependence or, more generally, how the cognitive theory specifically generates a coherent theory of social institutions" (p. 44). We argue that the cognitive limitations between individuals on the one hand and the widespread social order on the other – Hayek's general unique contribution – are driven predominantly and more essentially not by the neurological nature of the mind but by the inherent complexity of the subject matter that they attempt to explain – the social world around us. With Hayek's theory of mind in hand, one can recognize Hayek's major contribution – knowledge is scarce and society is complex – but it is not the only way to get there nor does the nature of neuroscience appear to be the dominant source of cognitive dissonance in the social world. In other words, the degree of complexity that Hayek attributes to the mind in forming sensory perceptions is proportionate to the degree of simplicity suffered by an individual in relation to his amount of knowledge in society. But this amount of complexity is dwarfed by the degree of complexity that Hayek ascribes to the physical and social worlds – the very subject matters that sensory perception processes are trying to make sense of. Thus, we are left to conclude that the heavy lifting in promoting social order is predominantly done by emergent social institutions compared to complex neural processes.

Furthermore, it seems obvious that Hayek's (1937, 1945) writings on the economics of knowledge were clear that the process of exchange does in fact *generate* unique points of knowledge. In fact this was the essential point made by Hayek in the infamous socialist calculation debates. Hayek's (1945) point was framed directly against market-socialists Oskar Lange (1936, 1937) and Wassely Leontief (1951, 1986), who argued that with the right calculative ability production and distribution in a socialist economy could be achieved. Hayek's contribution was to specifically point out that without individual actors engaged in buying and selling at market prices, the necessary datum to plug into such calculations does not exist. Hence markets generate uniquely necessary knowledge within economic systems. It is not only Hayek's work in neuroscience that addresses the generative aspects of knowledge despite Buto and Koppl's (1996, pp. 41–42) contrary claim. Does *The Sensory Order* have a useful economic future? – not

necessarily, certainly not by necessity and perhaps not without sacrificing an understanding that may be more true to form and more powerfully explanatory.

CONCLUSIONS

Economics is an objective science that attempts to deal with the infinitely troublesome nature of subjective agents. But regardless as to the role of intersubjectivity and sensory perception there are truths of economic law. Demand curves slope downward and the division of labor is limited by the extent of the market. Our position in the debate on the role of *The Sensory Order* is simply one that while acknowledging Hayek's great depth and breadth as a thinker, argues that the relative weight ought to be on his contributions to economics and political economy.

All we are asking our fellow Austrians is to consider the possibility that many economists might not find the conversation in neuroscience – no matter how interesting it is for psychology – to improve the explanatory power of economics or advance our understanding of the market process. Is Ariel Rubenstein (2008) completely off track in his critique of the field with respect to the mainstream of economic thinking? He argues that neuroeconomics hopes to understand “all brains” yet falls short of its goals. Different patterns of choice are found among agents who make decisions in different amounts of time. It is unclear as to how such patterns map from the laboratory into real market behavior and thus it is unclear what amount or type of influence neuroeconomics may have upon the broader field of economic theory. In conclusion, we offer a set of brief comments and remarks.

First, Austrians such as Mises and Hayek already rejected the homo economicus description of man in economics and instead focused on a notion of homo agents (or *Homo sapiens*). Hayek's description of *The Sensory Order*, obviously fleshes out an important aspect of this rejection – agents are ill-informed by their own nature and cognitive limitations in addition to the quality or accuracy of the signals to which they perceive. So the Austrian vision of economics is less devastated by the sort of “behavioralist” critiques of “rationality” currently *en vogue* than are the traditional mainstream visions of economics. The same can be said for laissez faire conclusions supported on Austrian grounds.

Second, in the argument for an economic understanding of a free society, is not the heavy lifting of the explanation being done by institutional context, rather than by behavioral assumptions? With minimal behavioral

assumptions operating within an institutional context, we see a variety of complex and profound spontaneous orders in result. Rather than studying the mind per se, would we not learn more as economists and political economists by concentrating our efforts on history, politics, law, sociology, and economics? How is it that individuals act and react to institutions grown and imposed, new and old, successful and failed?

Third, we want to make it clear that we are not denying that *the mind matters*, but we think the mind matters mainly because of man's cognitive limitations, not because of things like emotion or chemical reactions, etc. We think that Lachmann's response to Nozick on methodological reductionism in the mid-1970s is still relevant (Lavoie, 1978) – we focus on the individual and his choices rather than the brain and its activities because it is only at the level of the individual that we can attribute *meaning* to action. It is only in reference to the meaning of action that we can begin to explain why an action did or did not occur, and what range of opportunity costs and benefits an individual faced. Austrian economics is an economics that strives to account for human meaning as an interpretive social science. To know the meaning of action is to make sense out of the social world.

Fourth, we agree that complexity, neuroscience, string theory, experimental techniques, and computer simulations are all fascinating fields of research and many have illuminating power with respect to economic principles. But the core of economic theory has been unaffected by these developments. To us, we can learn as much if not more in terms of illuminating exercises from explorations in history, anthropology, ethnography, and even literature as we do from a serious study of these more scientific exercises. We know that this runs contrary to our cultural bias, which is for the perceived “scientific” discipline to infiltrate the “less scientific” one – Mathematical economics compared to an economic approach to politics or law. We realize that in the debate over neuroscience and Austrian economics, we are pushing for a “softer” economics – an economic core which is used to do narrative history, an economic core which is discovered in the fictional discussions of great literature, and an economic core which is applied to understand politics, law, and society, etc. Where do we get the core economic theory? Not from complexity and neuroscience, we would contend, but from a close study of economic doctrine – Adam Smith (1776) to F. A. Hayek (1945), tested by the pure logic of choice. The claim that demand curves slope downward is true for Aboriginal cultures as it is for modern man.

We are all for letting every flower bloom intellectually, but we must also confess that we do not think we are heading to a state of intellectual

oblivion because neuroscience is not the thing we pay most attention to as economists. Others have alternative intellectual preferences. To put it another way, for the questions that we are interested in as economists and political economists we learn a lot from Andrei Shleifer (see Shleifer & Hay, 1998; Shleifer, Hay, & Vishny, 1996; Shleifer, La Porta, Lopez-de-Silanes, & Vishny, 1999), not as much from Colin Camerer (see Camerer, Loewenstein, & Prelec, 2005; Camerer & Fehr, 2006; Ming, Bhatt, Adolphs, Tranel, & Camerer, 2005). Not a knock on Camerer, but a judgment of relative importance is always a function of what topics most interest you for your research and teaching interests.

Loosely speaking Shleifer is pursuing the Hayekian program from *The Constitution of Liberty*, Camerer is exploring the Hayekian program from *The Sensory Order*. There is value added to bringing the Hayekian limits of knowledge argument to both tables. We merely claim that an economist or a political economist should be more focused on *The Constitution of Liberty* research agenda than *The Sensory Order* one.

NOTES

1. If our representation of these authors is not inline with their intended meaning then this paper merely serves as a clarification on such matters. We read them as we represent them here, and presume that others would garner similar interpretations as we have. In some cases, those we critique have phrased their arguments in terms that are at times both compatible and incompatible with our framework for understanding Hayek. In such cases, we have tried our best to quote both perspectives and clearly identify them.

2. Horwitz (2008, 2010) offers accessible summaries of *The Sensory Order*, as do McQuade and Butos (2005), Steele (2002), and Butos and Koppl (1993).

3. We mean to imply something analogous to how Hayek's mentor Ludwig von Mises described his own research agenda. Economics is recognized as the "best-developed branch" of praxeology – the broader study and science of human action (Mises, 1949, p. 885; 1957, p. 309).

4. One insightful referee points out the following: "[B]y 1952, Shackle (1949a, 1949b, later culminated in 1952, 1953) had already published his theory of choice under uncertainty which includes an economic view of attention via its ascendancy function, set out in terms of indifference curves... in Shackle's case it is very clear that the economic thinking came before the theory of attention."

5. It is also interesting to point out that Adam Smith's body of work is similar to Hayek's in its wide reach of topics. Thus, many scholars have been caught up on a "problem" in Smith's work (Viner, 1991). How could the scholar so convinced by self-interest in *The Wealth of Nations* (1776) be the same who is so concerned with sympathy in *Theory of Moral Sentiments* (1759)? More recently, some have arguably resolved the paradox (Smith, 1998) by showing the consistent general theory

throughout Smith's work. Most relevant here is the fact that in Smith's work on these other non-economics topics he comes strikingly close to Hayek's supposedly unique contribution that memory precedes perception. Smith's hypothetical construct of the impartial spectator admits to a gap between the appropriateness of one's own behaviors perceived by one's self and perceived by society (Smith, 1759, p. 110). Smith (1980, p. 38) also explains the classificatory role of perception and goes on to elaborate the primary role of memory to the practice of scientific investigation (p. 124).

6. At this point, the debate becomes very focused around the quality and or accuracy of archival evidence of which there appears to be different versions of (though the difference is subtle). On Hayek's motivation behind *The Sensory Order*, Koppl has reported that his translation of Hayek's 1920 manuscript reads,

[h]ere the author is making every effort to base his explanation exclusively on the physiological processes that underlie association processes and to avoid relying on any special psychic perceptive capacity of any special physiological hypothesis (such as cell memory). He hopes thereby to limit the explanation to a single recognized physiological law and to *integrate it into the world view of the natural sciences* (italics are ours, p. 1).

Our version contains a difference in translation to the closing sentence. "He hopes thereby to limit the explanation to a single recognized physiological law *compatible with the perspective of the natural sciences*" (italics are ours). We leave this matter for better-trained historians of thought and German language translators to resolve.

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