Know Thyself: Lesson for Immunology

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In contemporary considerations of immunology, a notable fervor abounds in the attempts of scholars and researchers in various fields to find alternatives to the paradigm of the immune system’s function introduced by Burnet.

That paradigm essentially reflected the “substantial” conception of the self defended by Aristotle and the early modern rationalists such as René Descartes, Baruch Spinoza and Gottfried Leibniz.

Many recent studies in immunology, however, are rooted in Jerne’s approach of viewing the function of the immune system as analogous to human cognition.
These accounts generally reject the *substantial* conception of the self, maintaining the same basic reservations expressed by the early modern empiricist and skeptic David Hume.

Hume argued that the self is something varied and complex, and is always undergoing change. Thus it is merely a succession of related objects, not one constant enduring, identical object. At most then, we can say that these related objects are *similar*, but not that they are, strictly speaking, *identical*.

What this position implies is that the self should not be viewed as something determinate, but rather something indeterminate.
Thus it seems that the various approaches that have been adopted in expounding the features of immunological function have tended to take the form of one or other of the two radically opposed traditions of thought on the nature of the self.

Virtually absent from both historical and contemporary theoretical treatments of immunology, however, is the Kantian notion of the self, and the associated revolutionary, epistemological principles that, on the one hand, merged the rationalist and empiricist traditions, and on the other hand, went beyond them.

My aim is to remedy this absence, and to demonstrate the usefulness of Kantian epistemological theory in interpreting certain crucial features of the cognitive-paradigm of immunologic function.
According to Hume, all ideas are copies of impressions that arise from experience.

Thus it is not possible to have an idea of something that does not have a corresponding impression.

Our idea of the self, is the idea of a, single, unified, constant, enduring and unchanging substance, but we lack a corresponding impression for this idea of the self – since such an impression of the self is never encountered in experience.

All our impressions of the self are of something that is always changing, and is thus different at different times.
The question that may be posed at this point is: Does Hume’s position constitute the only viable alternative to the substantial view of the self?

Hume’s position strikes one as unsatisfactory because it seems to leave us with a very compromised conception of the self as something indeterminate, since the commonsensical view of the self is that it is something determinate.

We just like to know when we are dealing with “the self” and when we are not; and in fact, most of us actually do think that we know this.

Thus it seems we are forced to choose between a view of the self as either unsatisfactory – Hume’s view, or as unintelligible – the rationalist view.
I contend, however, that these are not our only options, and that a more promising account may emerge from an examination of some central features of Kant’s theory of cognition.

My very limited treatment of this issue permits me to focus on only one such feature, which I think is of particular relevance to the question of whether or not some sense of the self/nonself distinction is operative in immunological function.

The feature I focus on is the notion of *synthetic unity*. 
My discussion of this issue consists of three parts:

I. The Self as Source of Synthetic Unity

II. The Synthetic Unity in Immunology

III. Selecting Objects and Selves

IV. The *Meta-Self* as a Dynamic Unity
According to Kant, any object that can be cognized by human beings must be a *unity*.

The unity of an object, however, is not something that the object comes equipped with; rather, this unity has its source in the cognizing subject.

Kant calls this *synthetic unity*, and asserts that it arises through the subject’s act of *combination* of the representations that we confront in experience.

Kant asserts: “among all representations *combination* is the only one that is not given through the objects but can be executed only by the subject itself, since it is an act of its [own] self-activity” (Kant, *Critique*, B 130).
This explains why Hume, and others, were unable to find the combination of the various representations that we call “the self” among the objects that we encounter in experience.

The source of the requisite unity is not something in the object that is cognized, but rather, in the subject that is doing the cognizing.

The subject synthesizes this multiplicity in accordance with the various a priori rules that issue from its cognitive faculties, and thus brings about a synthetic unity.

It is our awareness of this act of unity of the self, that generates our awareness of the existence of the self, and of its nature as the source of this unity.
Kant warns, however, that one of the consequences of the view that the subject is the source of the unity of an object is that our knowledge of objects is only a knowledge of mere appearances, not a knowledge of those objects as they are in themselves.

The reasoning for this is that what we can know in the objects is only what we ourselves put into them.

Thus, our knowledge of objects just reflects the rules of synthesis in accordance with which the subject synthesizes its representations, i.e., the subject can only know “itself.”
II: THE SYNTHETIC UNITY IN IMMUNOLOGY

- There is, I think, a significant parallel between Kant’s theory of cognition and a certain contemporary theory of immunology which maintains that the immune system engages in natural autoimmunity on a continual basis.

- A major proponent of this position is Irun Cohen who maintains that “the immune system constantly reacts to self constituents, hence autoimmunity is not a dysfunction, but the basis of normal immunity” (Cohen, 2000).
Similarly, Jerne generally defines autoimmunity as “an on-going surveillance process and not as an abnormal destruction” (Jerne 1974, in Pradeau 2004, p. 238).

On this view, some instances of autoimmunity result in harmful diseases to the organism while others do not.

It is maintained that the immune system does not really distinguish between self and non-self, “it only knows itself.”

• This implies the rejection of the absolute distinction between the cognizing subject (self) and the cognized object (not-self), (Tauber 2009).

• Specifically, these accounts of immunological function suggest that the immune system is not able to interact with something completely heterogeneous with itself, i.e., genuinely foreign to it, since any absolutely foreign substance could not enter the immune system’s cognitive framework, that is, could not be perceived or detected by it.
This claim, I suggest, is consonant with the core precept of Kantian epistemology: the cognitive subject can only know objects as they appear to us, that is, as conditioned by the forms and structures of its own cognitive apparatus.

This is not simply because the identity of the self varies in degrees, and thus cannot be determinately distinguished from the not-self (Hume 1738, Parfit 1989, Pradeu and Carosella 2006), but also because certain features of the self must be manifested in the not-self, since they are necessary conditions for the cognition of the not-self.
It should be stressed, however, that upon Kant’s view, the objects that the self knows, are only appearances.

A natural question that arises at this point is: If all our knowledge is merely knowledge of appearances, then does this amount to the view that all our knowledge claims about objects are mere illusions, and therefore false?
• This is not what Kant concludes.

• Rather, he maintains that some of our knowledge claims are objective, and thus yield valid knowledge of objects while others are merely subjective and thus do not yield valid knowledge of objects, but mere illusions.

• Kant’s theory of cognition offers an explanation of how to distinguish, among all our judgments, which ones yield genuine objective knowledge that holds for all subjects, and which do not.
Kant maintains that only some of these appearances get accepted by the subject as valid objects of experience regarding which objective knowledge may be had.

Specifically, these are appearances that are represented in space and time and which are synthesized in accordance with the rules provided by the pure concepts of the understanding, and which are ultimately unified in one consciousness, the unity of apperception.
• For Kant, whatever appearances can be unified in accordance with the unity of apperception’s rules of synthesis in the whole field of space and time constitute real objects, regarding which we may have objective knowledge.

• Whichever appearances cannot be so unified, do not count as well-founded appearances that represent real objects.
If we now consider the function of the immune system, understood in accordance a cognitive paradigm, I think we may discover pronounced parallel features to those operative in Kant’s theory of cognition.

What I maintain is that unharmful autoimmunity is analogous to objective, well-founded appearances that give rise to valid knowledge claims in Kant’s theory of cognition, while harmful autoimmunity is analogous to appearances that are merely subjective and give rise only to illusory and unjustified knowledge claims.

The immune system must distinguish from among the features of “the self” those that are tolerated and those that are rejected.
The question: “How does the cognitive system distinguish between valid objects and illusions, when both are mere appearances of objects and not things in themselves?” parallels the question: “How are some features of the self tolerated while others are rejected by the immune system, when both are equally viewed as features of the immune self?”

My response is that, in both cases, there are fundamental functions of *unity* that bring about this distinction.
The notion of *unity* in Kant’s theory of cognition parallels Pradeu and Carosella’s notion of *continuity* in determining what sets off a genuine immune response and what does not.

According to the fundamental principle which grounds the continuity hypothesis defended by Pradeu and Carosella, “every strong discontinuity in the interactions between immune receptors and their targets triggers an immune response” (Pradeu, 241).

Analogously, whatever appearances cannot be unified with the other appearances that constitute the whole world of objects cannot themselves be considered objects, but rather illusions.
A crucial point that should be stressed, however, is that although the cognizable features of appearances are produced by the subject’s inherent cognitive structures, the subject must be affected by the raw material (things in themselves) that are external to it, as it must have some content to work on, in order to fashion objects for itself.

- However, it can’t “know” this material in its raw, unsynthesized state.

- It can only know it once it has processed it in accordance with the particular rules of unity of its cognitive apparatus., i.e., once this “foreign” material become incorporated into the self.
Similarly, Cohen states: “molecular structure is the raw material of antigens” (Cohen, 1992, 492).

And just as the raw material that constitutes the content of sensible intuitions must be synthesized by the pure concepts of the understanding in order to yield knowledge, the raw material (foreign molecular structure) that the immune system encounters must be processed in some way by the components of the immune system in order to bring about immunity.
• But this is only achieved after this raw material is processed in accordance with the “networks” that constitute the connected features of the immune system, i.e., when it becomes a “part” of the “immune self.”

• In this way, the immune system may be characterized as a system of rules for synthesizing (organizing) the raw material that the organism encounters in the world, which is initially un-unified and unorganized.

• Because the immune system is the source of this order and unity, i.e., because it makes the rules, it controls the things governed by the rules.
IV: THE META-SELF AS A DYNAMIC UNITY

- From the above considerations the crucial lesson that I think can be learned from Kantian epistemology in the attempt to construct a model for understanding the nature of immunological function is: “Know Thyself.”

- This, however, does not entail a knowledge of the self as a constant identical substance, but as a dynamic unity that results from the world it produces, and its continual interaction with that world.

- The self, in this sense, is the sole source of unity that objects possess individually, and the unity of the world of nature that they form collectively.
• All that is presented to the subject is a manifold or multiplicity of representations, not a world of objects with which it immediately interacts.

• Rather, the self must first *produce* the world of objects, transcendentally, and only then does it interact with that world of objects, empirically.

• Part of what emerges from this process of production and interaction is a representation of what I think may be called a *meta-self*, that is, a dynamic self that cannot be viewed as identical to any determinate and constant nature, but which regulates all of its interactions with nature, and all of the various instances of the *self* that assert themselves in these interactions.
My suggestion is that the biological self, i.e., the organism, can also be understood as a self in terms of its serving as a source of synthetic unity, that is, the unity of its parts, in its interaction with the world, so as to produce a dynamic meta-self that it may distinguish from the world.

But, like the cognitive self, the biological self does not find this unity pre-made; it must produce this unity itself, from the multiplicity of biological functions in which it is immersed.
It should be stressed, however, that this account does not in any way imply that the identity attributed to the biological self is at any point fixed and determinate.

On the contrary, its identity is open-ended in the manner that Pradeu, Carosella and other suggest, but it is so in large part because of the continual function of the immune system, in its evaluation of the raw material by which it is affected, i.e. in its constant encounter with antigens, and through its determination of when to trigger an immune response and when not.
• The leading idea in this account of immunological function, is that its investigation should be guided not by the principle of identity, but by the principle of synthetic unity.

• I conclude therefore, that the primary function of the immune system is not to distinguish the self from the not-self, but rather to carry out the synthetic unity required for the self/not-self distinction to be made at a higher level, resulting in a dynamic meta-self.

• I hope this analysis has achieved its aim in demonstrating the usefulness of Kantian epistemology for expounding some complex features pertaining to the “self/not-self” issue in immunological function.