Forms of judgment as a link between mind and the concepts of substance and cause (Kant, Gödel)

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Introduction

At present, we do not dispose with some standard, generally accepted formal ontological theory, on the ground of which we could precisely know the meaning and the role of the concepts of substantiality and causality. Hence, the question is open how to define or axiomatically describe the concepts of substance and cause, and whether these concepts should have any important role at all in an ontological theory. In addition, it is in advance not clear how to justify this or that choice of a theory as an appropriate formalization of ontology. To give an example, Gödel's ontological system GO (built for the purpose of an ontological proof of the existence of God, see Gödel 1995b), as one possible candidate for a standard ontological theory, is far from being generally accepted, and many revisions of the theory have been proposed (see Hajek 2011). The situation is not better with other formalized ontologies proposed until now.

In addition, the famous Gödel's incompleteness theorem (1931) uncovered an essential insufficiency of all formal (syntactical) systems which include elementary arithmetic – in Gödel's philosophical interpretation: the reduction of mathematics (including logic) to formal systems contains a sort of "materialism", which cannot give a sufficient foundations for a theory to be a ("secure") science in the most proper sense: it cannot guarantee neither (1) its own consistency nor (2) the solvability of each yes/no question which can be formulated in the language of the system (cf. Gödel 1995a, pp. 376-381). Gödel's incompleteness result applies also to classical higher-order logic, for instance, in a shape of a formal ontological system. Namely, undecidable sentences can be constructed also in GO, which is a second-order modal system: if G is an undecidable sentence of Peano arithmetic, then $PA \rightarrow G$ is undecidable sentence in GO (where PA is the conjunction of the axioms of Peano arithmetic). Higher-order logics are notably complete with respect to Henkin models (with a higher domain as a subset of the power set of the product of the corresponding lower order domains), but for the price of the expressive defect of the non-categoricity of the condition PA. However, higher-order logics are not complete with respect to some comprehensive ontology

(with a higher-order domain "automatically" generated as the power set of the corresponding lower-order domains) .

Beside this intrinsic insufficiency of formal systems, questions also arise why to have the concepts of substance and cause in ontology at all, what is the origin of these concepts, and what is their primary meaning, independently of particular formal systems?

To start from Gödel, the concepts of substance and cause are regularly mentioned on his lists of "main categories" (Wang, p. 166), "philosophical concepts" (Wang, p. 179, see also p. 315), together with other concepts like "action", "reason", "necessity", "force" and others. Furthermore, although Gödel sometimes mentions that he has no definite list of "primitive concepts" (Wang, pp. 120, 288), he occasionally claims that causation should be "the fundamental philosophical concept", to which all other concepts should be reduced (Godel 1995b, pp. 432-433).[1]

How could we eventually decide which concepts are the primitive ones, and especially, if the concepts of substance and causality are among them, what is the relationship between the concepts of substance and cause? Gödel's instruction is that a systematic method, which could lead to the primitive concepts and axioms that would describe their interrelations, should include phenomenology.[2] Here is what Gödel has in general in mind under phenomenological method: what is essential in phenomenology is "to understand what is going on in our mind" (Wang, p. 167), introspection (e.g., Wang, p. 169), "attitude of mind which enables one to direct one's attention rightly" (Wang, p. 171); further, the phenomenological method should comprise the "directing our attention ... onto our own acts in the use of these concepts, onto our powers in carrying out our acts, etc.", and should "produce in us new state of consciousness in which we describe in detail the basic concepts we use in our thought, or grasp other basic concepts hitherto unknown to us" (Godel 1995a, pp. 382-382).

Gödel refers to Husserl and Kant as having made the first steps in building up a phenomenological method. According to Gödel, Husserl is more systematic than Kant.[3] However, although Gödel mentions that Kant's theory is in some aspects unclear, and contains errors and

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1   According to Wang (speaking about Gödel): "The main task of philosophy as he saw it was (1) to determine its primitive concepts, and (2) to analyze or perceive or understand these concepts well enough to discover the principal axioms about them, so as to 'do for metaphysics as much as Newton did for physics.'" (Wang, p. 288).
2   "Transcendental phenomenology with epoché as its methodology is the investigation (without knowledge of scientific facts) of the cognitive process, so as … to find the objective concepts" (Wang, p. 166).
However, "Phenomenology is not the only approach. Another approach is to find a list of the main categories (e.g., causation, substance, action) and their interrelations, which, however, are to be arrived at phenomenologically" (Wang, p. 166). Cf. also: "Leibniz believed in the ideal of seeing the primitive concepts clearly and distinctly. When Husserl affirmed our ability to 'intuit essences', he had in mind something like what Leibniz believed" (Wang, p. 168).
3   "Husserl does what Kant did, only more systematically" (Wang, p. 171). "Husserl's thoroughly systematic [beginning] is better than Kant's sloppy architectonic" (Wang, p. 298). Regarding categories: "Kant recognizes that all categories should be reduced to something more fundamental. Husserl tries to find that more fundamental idea which is behind all categories" (Wang, p. 171).

inconsistencies (Godel 1995a, Wang p. 171-172), Kant's theory is praised by Gödel for containing "deep truths" if understood "correctly" and "in a broader sense" (Gödel 1995a, pp. 384-387) (for Gödel's attitude toward Kant, see Kovač 2008a).

One of the points which Kant left in unclear, unfinished, and subject to disputes until the present time is precisely the "deduction" of categories, most importantly, of substance and cause, from, in the last instance, the "original unity of self-consciousness" as the fundamental principle of logic as well as of ontology ("transcendental philosophy").

In the *Critique of Pure Reason* and in *Prolegomena*, Kant sketches the "metaphysical deduction of categories" from the primitive forms of judgment, where the categories of substance and cause are "deduced" (in the sense of 'being justified') on the ground of the forms of the categorical and hypothetical judgments, respectively. However, the deduction of the primitive forms of judgment is only fragmentarily sketched and indicated in scattered parts of Kant's work. It is the most disputed link in the whole justification and derivation of the concepts of substantiality and [4]causality. We propose that this link can be in main lines reconstructed and consistently completed onm the ground of the fragments in Kant's work. In the reconstruction, we follow Klaus Reich's proposal (1948), but depart from his reconstruction mainly in the order and direction of the deduction of logical forms (Kovač 1992).[5]

In the here proposed and sketched reconstruction of the systematic derivation (see Kovač 1992 for a variant of such reconstruction), we start, following Kant, from the most general and simple unity available in our mind, from our sole act of thinking ("I think", "the act of apperception" B 137), and proceed to the conditions of the possibility of this unity, to acts and forms of thought by means of which this "original unity" is established. Thus, we deal only with "conceptual" ("logical", "analytical"), not intuitive, conditions of the unity in thinking. Because of the generality of the sketch, we do not propose any particular formalism for the proposed reconstruction of the system. Also, we do not claim that Kant had precisely such a derivation of

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[4] His lectures and reflections on logic do not follow this line of the presentation, because they had primarily didactic purpose. Kant's opinion was that a purely theoretic and systematic presentation of the subject would be rather damaging for the students in their age of intellectual development.

[5] General logic in the systematic form (as a science, "demonstrated doctrine", which gives "an exhaustive exposition and a strict proof of the formal rules of all thought", B IX) is to be distinguished from logic of Kant's lectures, as well as from Jäsche's *Logic*, which are meant with didactic, not primarily with systematic (scientific) purpose. Let us note that, despite some Kant's explicit confirmations (see quotations below), only a minority of scholars agree with the possibility and justifiability of a systematic derivation of Kant's logic from the original unity of self-consciousness. For example, Wolff's deduction of the Kant's table of judgments (Wolff 1995) is based on the passage "The logical employment of the understanding" and, of course, § 9 of the *Critique of Pure Reason.* Achourioti and Van Lambalgen's (2011) prove the completeness of Kant's table of judgments by the use of geometric logic and geometric implications. Let us remark that Kant's use of "tabular method" to present his twelve forms of judgment indicates that what is presented is "ein schon fertiges Lehrgebäude in seinem ganzem Zusammenhange" (see Jäsche's *Logic*, *AA* IX, p. 149).

logic deduction in mind, but some such deduction he probably might have in mind, and it is at least partially explicitly confirmed in his work - whenever possible, in our reconstruction we will refer to respective places in Kant's text.

1. The original unity of self-consciousness (Kant)

1.1 *Analytic unity of self-consciousness*

Our reconstruction begins with the most general and most simple unity of a given manifold of my representations (*das Mannigfaltige der Vorstellungen*, B 129) of which I can be aware (we follow Kant's analysis in B 131-136). This unity is "me", the representing agent: to "me" are all these representations possibly given, in the sense that I can "accompany" (*begleiten*) each of these representations by a thinking act ("I think"):

[I think]*a*, [I think]*b*, … ,

where *a*, *b*, etc. do not connote any ordering or other sturcture of representations except of their being possibly thought of by the same thinking subject. (a) In order to unambiguously be "me" for me, "me" has to be self-conscious (apperception) – there is no need for it to be further accompanied by any other representation, and (b) in order for the manifold to be given to "me", "me" has to be conscious of the representations given to it ("me" "accompanies" all my representations). Taking (a) and (b) together Kant names this self-consciousness "original" (*ursprüngliche*) self-consciousness (B 132). Without the possibility that "I think" accompanies my representations they would be impossible or at least "nothing for me" (B 131). This self-conscious accompanying of all my representations is nothing already "given", but an act which I (my intellect, understanding) each time executes anew. This "I think" is, at first, what Kant calls the "analytic unity of self-consciousness", since it is one and the same (self-conscious) instance to which all my representations are related - it is the "thoroughgoing (*durchgängig*) identity" of my self-consciousness in all manifold of my representations, and in it all my representations "can stand together" in an "original combination" (*ursprüngliche Verbindung*).

1.2 Synthetic unity of self-consciousness

The next stage of the unity of our representations follows on the ground of the further analysis of "I think". Namely, the manifold: [I think]*a*, [I think]*b*, etc., contains "conjoining" (*hinzusetzen*) of representations to one another by the same "I think":

[I think](a, b, …).

Otherwise, there is no guarantee that what accompanies our representations is not each time some other or empirically different "I think" (empirical consciousness). Thus, as Kant states, the analytic unity of self-consciousness is possible only under the condition of the synthetic unity of self-consciousness", or in other words, the synthetic unity of self-consciousness is a condition of possibility of the analytic unity of self-consciousness itself (B 133).

1.3 Objective unity of self-consciousness
As Kant further shows (B §17), the synthetic unity of self-consciousness is *objective* ("objectively valid") since by the synthesis of representations, and only in this way, a relation of representations to the concept of an object is established, hat is, the synthetic unity of self-consciousness is possible only by means of the unity of our representation in the concept of an object:

[I think](a, b, …)(x).

1.4 Necessary unity of self-consciousness
Finally, since the manifold of our representations can be something only in a relation to the unity of "I think", as already mentioned under (1), it follows that this manifold stands in a *necessary* relation to the unity of self-consciousness, and hence we can say that this unity is a necessary unity of self-consciousness (B 140, 142, 135), that it, without it there are no representations for us:

$(a, b, ….)(x), … \setminus [\text{I think}] = \text{nothing}$

As can be read off from Kant's text (B §§18-19), the unity of original self-consciousness can be objectively valid only insofar as it is a necessary unity. Non-necessary (contingent) unity, is empirical, dependent on perceptual associations and changeable states from person to person, and yields only subjective validity.

1.5 "The highest point"
This most general four-fold analysis of our act of thinking (analytic, synthetic, objective, and necessary unity of self-consciousness) should be, in Kantian approach, the starting point for the foundations of logic and transcendental philosophy. Kant emphasizes in the *Critique of Pure Reason* the moment of the synthetic unity of self-consciousness, since this is the *form* under which the *a priori* extending of our knowledge is possible, and thus says:

The synthetic unity of apperception is therefore that highest point, to which we must fasten [*heften*] all the employment of the understanding [*Verstandesgebrauch*], even the whole of logic, and after it [*nach ihr*], transcendental philosophy. Indeed this faculty of apperception is the understanding [*Verstand*] itself.[6]

2. The logical deduction of the primitive forms of judgment from the original unity of self-consciousness (Kant)

The question of the completeness of the Kantian table of twelve primitive forms of judgments cannot be decided by comparison with some outer class of models. It is purely intrinsic question, which can be decided only in relation to the above sketched Kant's theory of the unity of original self-consciousness. If it could be shown that his table, in a way, exhausts all the moments of original unity of self-consciousness as applied to the general theory of judgments, this could be a reliable sign that Kant's completeness thesis hold. But such a deduction of judgment forms stands in the context of the whole general logic as it should be established on the ground of the theory of the unity of original self-consciousness. We restrict ourselves here to some necessary remarks about Kant's general theory of concepts, and then focus on the general theory of judgment, especially on relation of judgments, from which Kant claims the categories of substance and causality should be derived.[7]

The original unity of self-consciousness as the most general unity of our representations would not be possible without being able to distinguish itself from the manifold of representations, and could not be conscious of this manifold (and combine representation of the manifold with one another) without being able to distinguish the representations in the manifold from one another. This is possible only if the analytic unity of consciousness can be specifically "attached" to a singular representation in the manifold of representations, to distinguish it from other representations.

2.1 Concept

This leads to general logic and its general theory of concepts. A concept has a form of the analytic consciousness of a concrete representation (e.g., "red"), which as an identical representation can be encountered on a variety of objects as their common note (*Merkmal*). By *comparison* we become conscious of the identity and difference of representations, by *reflection* we think of a

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6 B 134*, Kemp Smith's translation, modified.
7 A full systematic derivation of Kant's general logic on the foundations of his theory of original unity of self-consciousness is proposed in Kovač (1992).

representation as belonging to objects (universality), which relation is essential for a concept, and by *abstraction* we separate the chosen general representation from other representations. We see that a concept is possible only in the context of synthetic, objective, and therefore necessary consciousness (because of combinations with other representations, relations with objects, everything on the ground of the necessity of consciousness):

$$[a](b, c, ...)(x), …,$$

where *a* is a concept, *b*, *c*, ..., other representation combined with *a*, and *x* is an object to which *a*, as well as *b*, *c*, ... belong. However, concept as such has on itself only the analytic consciousness abstracted out of these interconnections of representations (*AA* XVI *Logik*, Refl. 2862-2884).

2.2 Judgment

Since a concept as a "common note" belong to objects (reflection), it obviously presupposes and includes an objective unity of consciousness of the concept with the representation (concept, possibly different) of objects to which it belongs, as well as with other, different representations (concepts) which also belong to the same objects. What a concept presupposes is thus that it is together with other representations (concepts) "brought to the objective unity of self-consciousness". The "manner of bringing given representations to the objective unity of self-consciousness" (paraphrase of B 141) is, according to Kant, a *judgment*, more precisely, its "logical form" (B 104)[8].

It clear that a concept also presupposes a synthesis of representations into a representation (again a concept) of an object (since the concept contains the reflection that it belongs to this object)[9]. But for now it suffices that object can be analytically represented by some of its notes (by a concept). The question how a concept of an object can be synthesized leads to the "metaphysical deduction of categories", which will in fact apply the logical form of judgments (which represents the objective validity of concepts) to the synthesis of concepts.

In four aspects of the original unity of self-consciousness we can recognize four "titles" of Kant's table of judgments (B 95):

(1) as including analytic consciousness, and thus conceptual generality, judgment has a

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8 Cf. also iudicium est repraesentatio unitatis obiectivae... in conscientia variorum conceptuum. (*AA* XVI, Refl. 3052). See also *AA* XVI, Refl. 3045.
9 "A representation which is to be thought as common to different representations is regarded as belonging to such as have, in addition to it, also something different. Consequently, it must previously be thought in synthetic unity with other (though, it may be, only possible) representations, before I can think in it the analytic unity of consciousness, which makes it a conceptus communis." B 134*.

quantity,

(2) as including synthetic consciousness, the combination of representations, judgment has a quality,[10]

(3) as including objective consciousness, a representation of objective validity, judgment has a relation (of what is asserts to the condition of the objective validity),

(4) as including necessary consciousness, only by means of which the objective unity of consciousness is possible (see B 140, 142), judgment has a modality of thought (consciousness) itself.

It is clear that by covering with this "titles" all the four aspects of the original unity of self-consciousness Kant's theory of judgment should be in general complete with respect to its foundational point (i.e. to the theory of the original self-consciousness). The justification of singular "moments" under titles (1), (2), and (4) in Kant's table of judgments is almost self-evident (1. universal and particular, 2. affirmative and negative, 4. problematic, assertoric, and apodictic judgments). According to the *quantity*, a judgment represents to which extent is some (general) representation objectively valid (e.g., for "all" or for "some" objects of a certain kind), i.e. to which extent is the representation analytically contained in some manifold. But we can think of this analytic containment only on the condition that this representation can be combined (synthesized) with the representation of the manifold – which pertains to the *quality* of judgment. This synthetic unity of representations with respect to one another is thought in a judgment as a unity in object (it is not an association of representations in this or that empirical state of the subject, B 140, 142) , that is, the representations synthesized with one another in a judgment stand in an objective *relation*. Let us remark that the title of relation refers exactly to the aspect by means of which Kant generally defines judgment in the logical sense (runity of consciousness).[11]

The relation of a judgment is our central point of interest. Kant defines it as a relation of a representation (an "assertion") to the condition of its objective validity (see Reich 1948 pp. 47, 63-67, Longuenesse 1998 pp. 93-95, Kovač 1992 pp. 88-89,). Of three possible relations the first is the condition of the objective validity of concepts, and the next one is always the logical condition of the preceding one. In the result, the three possible relations are three possible grades of strengthening the condition of objectivity of a judgment. Let us note that the subdivision according to relation is original Kant's subdivison of judgments.

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10   See B 131: "...for all categories are grounded in logical functions of judgment, and in these functions combination [Verbindung], and therefore unity of given concepts, is already thought".

11   "Die categorie des Verhaltnisses (der Einheit des Bewußtseyns) ist die Vornehmste unter allen. Denn Einheit betrifft eigentlich nur das Verhaltnis; also macht dieses den Inhalt der Urtheile überhaupt aus" (GS 18, Refl. 5854).

2.2.1 *Categorical judgment.*

In the first relation (categorical judgment), a concept is asserted as a predicate (a) under the condition of its validity for underlying object (*x*) represented under the subject (*b*) of a judgment (cf. Reich pp. 72-73, Kovač 89-91):

[*Q*] *x*, which is contained under *b*, is also under *a*, where *Q* is "all" or "some",[12]

for short:

Qx(b, a), where *Q* is "all" or "some".

Predicate, *a,* as a concept, "contains" analytic unity of consciousness. It is subordinated to the condition of the subject, *b* (which is also a concept with analytic unity of consciousness), under which object is represented, and to which, possibly, other predicates belong.[13] Subject therefore has (in the representation of object) synthetic unity of consciousness. The predication (belonging) itself represents objective unity of consciousness of the predicate with respect to the subject. Further, the predicate cannot be thought as contradicting the subject, that is, it cannot deny the condition of its own objective validity. However, mutually contradictory predicates (denying one another) can be thought as belonging to the same subject: they need not be excluded by the analysis of the subject, and can be objectively valid with respect to the same subject synthetically, in different non-logical aspects (for example, in different times). This condition is expressed by Kant in his "principle of contradiction" (B 189-193): "no predicate contradictory of a thing can belong to it", i.e. "not (*a*, not-*a*)".

It is obvious that Kant's categorical logic is "paraconsistent" (non-explosive under inconsistency) since "(*b, a* and non-*a*)" (for simplicity we leave out quantification) is not a contradiction, provided that *a* or non-*a* do not contradict *b* (see Kovač 2008b).

To take a look in advance from the standpoint of Kant's "transcendental logic", this form of judgment, as a "function of our understanding" (*Verstand*), will be shown to be precisely the function, which in application to the manifold of representations in one intuition gives categories of substance and accident (B 104-105, see below).

2.2.2 *Hypothetical judgment.*

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12   *AA* XVI, Refl. 3096.
13   "Das Subjekt eines Urtheils, dessen Vorstellung den Grund der synthetischen Einheit einer Manifgaltigkeit von Prädikaten enthält, is *Objekt* (*AA* XVIII *Metaphysik*, Refl. 6350, p. 676). Also "Der Begriff der die synthetische Einheit der Apperzeption des Manigfaltigen … enthält, ist der Begriff von einem objekt. Er ist auch das Subjekt eines Urtheils, das viele Prädikate hat (ib. pp. 676-677).

Under which logical condition can be decided between the objective validity of "(b, a)" and "(b, non-a)" (that is, between "S is P" and of "S is non-P")? It could only be a form that itself represents an objective unity, that is, it should be a judgment (possibly another one). The asserted judgment is a consequent that "follows" from the conditioning judgment as its reason. Note that in a categorical judgment the conditions which can distinguish between "S is P" and "S is non-P" can only be non-logical (e.g., time). Hence, to assert a judgment, its reason is needed – this is the co-called principle of sufficient reason: "each assertion has its reason".

Since, by a reason, "a and non-a" is excluded as belonging to the same subject, now the Aristotelian form of the principle of contradiction follows: "not (b, a and not-a)". On the other side, reasons are thought in a hypothetical judgment only hypothetically (in "if-clause"). Therefore, the objective validity of reasons may be undecided, and, because of this lack of knowledge, the possibility occurs neither to assert "(b, a)" nor "(b, non-a)". In this sense, it can be said that Kantian logic of reasons is "paracomplete" (not obeying the principle of excluded middle).

As Kant will indicate in his "transcendental logic", the function of understanding by means of which the hypothetical form of a judgment is produced is one and the same that establishes the category of causality, when applied to the manifold of representations in one intuition (B 104-105, see below).

2.2.3 *Disjunctive judgment*

Under which condition the deficiency in establishing full objective validity of a judgment (due to the hypotheticity of reasons) can be overcome? It is the condition of completing the assertions so as to form an objectively valid whole, within which the objectively valid assertion should be contained as one of its parts. In the third relation (disjunctive judgment, in the exclusive sense) assertions are put under the condition of the whole of (objectively valid) knowledge, so that if the objectively valid assertion is not in one part of the whole, for that reason, it has to be within the remaining parts of the whole, and vice versa. That is, assertions themselves are mutually exclusive but complementary reasons:

[Q] x, which is contained under a, is under b or c, etc., where Q is "all" or "some",[14]

for short:

Qx(a, b or c, etc,), where Q is "all" or "some".

Thus, this relation stands under the principle of excluded middle, "a or not-a", which finally yields

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14   *AA* XVI, Refl. 3096.

a sort of standard logic obeying all the three mentioned logical laws.

Note that disjunctive judgment (the same holds of hypothetical judgment as well) can be quantified. This means that the relation of judgments cannot be determined by the "main operator".

Clearly (analytically), there is no further condition that could be logically added to the condition of the *whole* of knowledge, in relation to which the full objectivity of our representations (which is the logical essence of a judgment) could be obtained.

From the transcendental logical aspect, the logical form of disjunctive judgment is a function of understanding which in the manifold of representations in one intuition gives category of mutual influence of substances (agent and patient, community) (B 104-105, see below).

Remark

If we compare three grades of the relation of a judgment with the aspects of the original unity of self-consciousness, it can be seen, first, that categorical judgment represents objective unity of consciousness (the logical essence of judgment) in our representations as bringing the analytic unity of consciousness (contained in a predicate as a concept) under the condition of the synthetic unity of consciousness (in a subject)[15], secondly, that hypothetical judgment combines the objective unity of consciousness: it represents the objective unity of consciousness in relation to the objective unity of consciousness (assertion as grounded in a reason), and thirdly, that objective unity of consciousness is subsumed under the necessary unity of consciousness of complementary assertions as reasons, exclusively one of which *has* to have objective validity.

Let us remark that in each judgment the condition (subject, reason, whole) has to be given in a form of objective validity (even this condition is contradictory or false). Hence, for example, "This judgment is not true" is not a judgment because it's subject ("This judgments is not true" itself), being antinomic, is not given.

2.2.4 Modality

Modality of judgments is essentially interconnected with relation. A judgment can bring given representations under the objective unity of consciousness only if a consciousness is possible of this objective unity of consciousness. That is, a sort of objective self-consciousness of a judgment, i.e. a consciousness of its own objective unity as given (not merely of the given representations that make its content), should be possible for each judgment. What can be here distinguished can only be a modality, strength ("energy"), of the objective unity of consciousness itself, as we have seen it

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15   As it can be seen, predicat-subject relation reflects in concrete representations the original relation of self-consciousness according to which the analytic unity of self-consciousness is possible only under the condition of synthetic unity of consciousness (B 133, 135).

gradually to increase from the possibility of mutually contradictory predications, to actual (true) judgment that is grounded in a reason, to necessary judgment as determined by other judgments (as reasons) within some whole of knowledge (B 100) (problematic, assertoric, and apodictic judgments).[16]

Remark (Completeness)

Kantian forms of judgments, as it could be seen, define some very general features of logical thinking, across possible specific formal systems, delineating the gradual strengthening of logics by means of the strength of logical laws contained in a form of judgment, and are thus hardly without loss in structure and semantics, and without artificiality, translatable into sentences of a particular formalism.

Although the above "deduction" is not reduced to the rigor of some logical formalism, it is hardly to be seen what could be possibly missing in Kant's table of judgments with respect to his basic theory of original unity of self-consciousness. Hence, Kant's table of judgments seems to be complete.

Remark (Inference)

Let us mention that the transition from judgment to inference as the condition of the possibility of judgment should be similar to the general transition from objective to necessary unity of self-consciousness. The objective unity of consciousness of a judgment is possible because the representations in a judgment belong to one another only by means of their relationship to the necessary unity of self-consciousness (not merely to the empirical, casual subjective state of consciousness, which is not objective) – which does not mean that the representations themselves should necessarily belong to one another (cf. B 142). That representations are united by means of their relationship to the necessary unity of consciousness is represented by assigning them a role and interconnecting them within the necessary derivation in an inference. Precisely the necessity of an inference (as a necessary unity of consciousness) is the reason why each empirical reasoning agent has to accept what was proven by an inference.

3. Objective validity of the concepts of substance and cause

As Kant states (cf. B 105, 143), it is one and the same acts (operations) of one and the same

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16   On comparison of the relation and the modality of judgments in Kant see *Letter to Reinhold* 19.5.1789 (*AA* XI, p. 45), B 99-101, and Reich 1948, pp. 73-76.

intellect that we employ in giving unity to the manifold of concepts and establishing in them a form of a judgment, and in giving unity to the manifold of an intuition and establishing in it a transcendental content (the concept of an object).

An objectively valid form of a judgment (being the logical essence of a judgment) cannot be anything else than the form already contained in the object. This is so because the form already contained in the object (the concept of an object) is nothing else but a synthetic unity produced by the original self-consciousness. By means of judgment, original self-consciousness only analyses what it has already synthesized into a concept of the object. Because of this, primitive concepts of objects (categories) can be found precisely by means of primitive forms of judgments. Leaving aside other categories, we thus finally come to deduce the concepts of substance and cause as the primitive concepts (categories) originating from the power of thinking itself (original self-consciousness): first, to the subject-predicate relation in judgment corresponds in application to representations given in an intuition the substance-accident relation in an object; secondly, to the reason-consequent relation corresponds in application to representations given in intuition the cause-effect relation between objects, so that ontologically correctly we assert the state of an object as a consequence of the state in (another) object; thirdly, to the whole-part relation corresponds in application to representations given in intuition the concept of community of objects (reciprocity between agent and patient), and we properly. Thus, in the ontologically proper way, we predicate an accident to its substance, we assert a state of object as following from another state of object as its reason, we divide a whole into reciprocally interacting parts (cf. B 128-129). (The three "schematism" that mediate between the two heterogeneous kinds of representations: concept and temporal intuition, are a) permanence and transience, b) precession and succession, and c) simultaneity.)

With respect to the categories of relation we simply note the same graduation of strength: the determination of a substance by its accidents is objectively conditioned by the causes of this determination. And, further, each causal relationship stands in the context of mutual causal interrelationship within a causal whole. Accordingly, three fundamental relation categories outline the epistemological gradation: a) probabilistic knowledge of a "field of possibilities" around a persistent object (substance); b) constructive knowledge of causal explanations; c) holistic knowledge of mutual causal interdependencies. On the ground of our reconstruction, it seems that we, as thinking and intuiting beings, are necessarily referred to think in the categories of substantiality and causality (including holistic causal structures), since they are in the last instance founded in the most primitive ways how our intellect functions on given representations.

It is interesting, in the end, to compare this Kantian result with respect to relation categories

with the parallel result envisaged by Gödel. In fact, Gödel claimed several times that he has no definite list of primitive concepts.[17] But on other places, he states that causality should be the fundamental concept of philosophy. Both claims should be put in the light of Gödel's accepted idea of egological phenomenological foundations of knowledge. (1) In his formal ontological system, Gödel defines essence of an object *x* as a property that is the reason of all the properties of *x* (Godel 1995b, p. 403 Definition 2, what we have read off as reason-consequent relation is in Gödel's formalization a necessary conditional). So predicates are unambiguously determined by the essence of the subject (if the subject has any essence) as by their reason, and accordingly, from the categorial standpoint, accidents would be caused by the essence of the substance to which they inhere. Inherence is thus reduced to causation. Of course, reciprocal influence is a causal whole. (2) If logical functions are not only forms of objectivity, but also a real part of objectivity, then they have a place within causal interdependencies. Our intellect, as a part of a causal whole, may then not be completely at our disposition: "the active intellect works on the passive intellect which somehow shadows what the former is doing and helps us as a medium" (Wang, 1996: 189). This may perhaps explain Gödel's statement that he did not arrive at some definitive list of primitive concepts. But this also leaves open the perspective of the perfection of our mind in understanding primitive concepts, especially once we would have means for its "systematic and conscious advance" (Godel 1995a, p 385).

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17 The possibility to arrive at some definitive primitive concepts may have to do something with whether we are thereby dependent on intuition or not. "Number theory needs concrete intuition, but elementary logic does not need it. Non-elementary logic involves the concept of set, which also needs concrete intuition. Understanding a primitive concept is by abstract intuition" (Wang 1996, p. 217).

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