



Husserl's Psychology of Arithmetic

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In 1913, in a draft for a new Preface for the second edition of the *Logical Investigations*, Edmund Husserl reveals to his readers that “The source of all my studies and the first source of my epistemological difficulties lies in my first works on the philosophy of arithmetic and mathematics in general”, i.e. his *Habilitationsschrift* and the *Philosophy of Arithmetic*.¹

I carefully studied the consciousness constituting the amount, first the collective consciousness (consciousness of quantity, of multiplicity) in its simplest and higher levels (consciousness of sums, sums of sums etc.). I immediately separated proper (intuitive) and symbolic consciousness, in the characterization of the former I hit the radical difference of categorial consciousness [...] and sensuous consciousness of unity.²

Later on, in the Third Investigation, Husserl makes some very specific claims, that are of considerable importance to assess the development of his early works and their relation to his later phenomenology:

This first work of mine (an elaboration of my *Habilitationsschrift*, [...], 1887) should be compared with all assertions of the present work on compounds, moments of unity, complexes, wholes and objects of higher order. I am sorry that in many recent treatments of the doctrine of ‘Gestalt-qualities’, this work has mostly been ignored, though quite a lot of the thought-content of later treatments by Cornelius, Meinong etc., of questions of analysis, apprehension of plurality and complexions is already to be found, differently expressed, in

¹ Husserl (1891), critical edition in Husserl (1970), translation in Husserl (2003). Translations are mine, unless otherwise specified, and modified where required, without notice.

² Husserl (2002, p. 416).

my *Philosophy of Arithmetic*. I think it would still be of use today to consult this work on the phenomenological and ontological issues in question, especially since it is the first work that attached importance to acts and objects of higher order and investigated them thoroughly.¹

Hence, at the time of the *Ideas*, Husserl retrospectively considers his first works² as being still relevant for *phenomenological* issues. Not only does Husserl advance a very interesting priority claim with respect to Von Ehrenfels' development of the notion of *Gestalt* and Meinong's development of *Gegenstandstheorie*,³ but also a strong affirmation of continuity and coherence of his position from 1887 all the way up to 1913, encompassing the alleged "revolution" in his position from psychologism to anti-psychologism in the 1890s. Indeed, according to much of the recent secondary literature, in 1894, right in the middle of the ten "incubation"⁴ years between the *Philosophy of Arithmetic* and the *Logical Investigations*, Frege's destructive review⁵ would have converted Husserl to antipsychologism practically overnight.⁶

¹ Husserl (2001b, p. 350, n. 8), Husserl (1984, p. 289).

² Regarding the complex relation between his *Habilitationsschrift*, the booklet *On the Concept of Number* and the *Philosophy of Arithmetic*, see Ierna (2005).

³ For acts and relations of higher order in Husserl's earliest works, see Ierna (2006, pp. 72 ff.) and on Husserl and *Gestalt* see Ierna (2009).

⁴ Boyce Gibson's term, see Schuhmann (1977, p. 29).

⁵ Frege (1894).

⁶ The following is by no means an exhaustive list, but certainly a very representative one, as these are all highly visible and well-known authors and works, providing general introductions to phenomenology and Husserl, i.e. giving a quite definite first (and probably lasting) impression to those who approach this field for the first time: notwithstanding the caution in some of the formulations, all assign a significant role to Frege's review. Beyer (2010, p. 888): "Frege, whose critical review of PA seems to constitute one of the causal factors that eventually led Husserl to turn against psychologism ..."; Smith (2007, p. 18): "Frege wrote a critical review charging Husserl's *Philosophy of Arithmetic* with psychologism ... Husserl readily accepted Frege's anti-psychologism, seeming to turn sharply in his tracks and to move in a different direction."; Welton (2003, p. 11): "More than anything else, the critique of the mathematician and philosopher Gottlob Frege gave Husserl the impetus to develop his ideas, which in turn led to his classical refutation of psychologism in the *Prolegomena*." Moran (2000, p. 73): "Frege, however, reviewed Husserl's *Philosophy of Arithmetic* very critically in 1894, and his searching criticisms may have been partly responsible for Husserl's change of focus".

This gives us two conflicting interpretations: on the one hand, Husserl himself in 1913 still seems to approve of the *Philosophy of Arithmetic* and even considers it to contain valuable phenomenological material, on the other, it is routinely dismissed by much of the secondary literature as hopelessly psychologistic. So which one is it: do we have a phenomenological arithmetic or a psychologistic arithmetic in Husserl's first book? On balance, I think that Husserl in his *Philosophy of Arithmetic* developed a position that does not fall prey to the exaggerated and poorly aimed critiques of Frege, while at the same time, as a descriptive psychology of the genesis and constitution of number, it can certainly be considered as providing phenomenologically meaningful analyses, though of course not made from within an explicitly transcendental phenomenological framework.¹

Husserl's psychological analysis of the concept of number

To evaluate Husserl's position at the beginning of his career we need to take the historical context of his development into account, in order to avoid teleological descriptions of Husserl's development that would lead to anachronisms by projecting later terminology onto earlier works only to conclude circularly that mature views were already implicit in earlier positions. Nevertheless, with respect to some subjects parallels abound between Husserl's early and late works. For instance, in the Husserliana volume on *Analyses Concerning Passive and Active Synthesis*, when discussing association and the "Primordial Phenomena and Forms of Order Within Passive Synthesis", Husserl describes again the "possibility of many [elements], indeed, a multiplicity being continually fused into a unity within one consciousness, *implicite*, such that consciousness is not a consciousness of a multiplicity"², he elsewhere also remarks on degrees of fusion, and there are various sections dedicated to sets and wholes, etc. In all of this, it is remarkable how it looks like Husserl is still elaborating and building on, rather than radically revising and rejecting, his earliest accounts of collecting and counting. The profound methodological change stemming from the

¹ This is quite close to the assessment in Becker (1930, p. 119): "The subtitle of the work [the *Philosophy of Arithmetic*] is "Logical and Psychological Investigations" [sic] and it is precisely in the "Psychological" that we find the new and progressive elements of the work. In truth, these are investigations that today we would call "constitutive-phenomenological", though this is nowhere fundamentally examined philosophically in this early work."

² Husserl (1966, p. 120), translation from Husserl (2001a, p. 165).

development of phenomenology as a transcendental discipline does of course cast Husserl's earlier analyses in a new light and he certainly adds much more detail to them, but they are not simply rejected, discarded and forgotten, but rather recovered, retained and renewed.

To better understand his early theories it is important to realize what Husserl's background and training were at the time of the writing of the *Philosophy of Arithmetic*. On the one hand, Husserl had only occasionally attended some lectures in philosophy, first with Wundt in Leipzig, seemingly with little profit,¹ and then with Paulsen at the university of Berlin. On the other hand, Husserl had always intensively and enthusiastically² studied mathematics, first in Leipzig, then in Berlin with Weierstrass and Kronecker, and finally in Vienna with Weierstrass' student Königsberger, obtaining a doctorate in mathematics in 1883 with a technical work *Beiträge zur Variationsrechnung (Contributions to the Calculus of Variations)*.³ At this point Husserl was in doubt whether to choose to dedicate his life to mathematics or to philosophy, but Franz Brentano's lectures in Vienna, which Husserl started attending in 1884, gave the breakthrough.⁴ A few years later, in 1886, Husserl went to Halle to obtain his *Habilitation* under the supervision of Brentano's student Carl Stumpf. Husserl obtained his habilitation in philosophy in 1887 with his thesis *Über den Begriff der Zahl. Psychologische Analysen (On the Concept of Number. Psychological Analyses)*.⁵ In this work we see that Husserl combines the two main influences of this early period: his mathematical training under Weierstrass and the methods of descriptive psychology and psychological analysis of Brentano and Stumpf. In the next few years, Husserl elaborated his habilitation essay into his first major philosophical publication, the *Philosophy of Arithmetic*. This brief survey of Husserl's studies shows that Husserl had not really studied philosophy very intensively before his encounter with Brentano. Since Husserl's knowledge of philosophy before 1891 is mostly knowledge (and endorsement) of the aims and methods of Brentanist descriptive psychology, his "philosophy of arithmetic" might therefore be considered just as well a "psychology of arithmetic".

¹ Schuhmann (1977, p. 4).

² In a letter of 20 January 1878, Masaryk tells Husserl that he shares his "*Begeisterung*" for mathematics, see Husserl (1994, Vol. I, pp. 101 f.)

³ Oddly published only in a French translation: Husserl (1983).

⁴ See Schuhmann (1977, p. 13) and Gerlach and Sepp (1994, p. 165).

⁵ The first chapter of this work was published as Husserl (1887), critical edition in Husserl (1970, pp. 289-339), translation in Husserl (2003, pp. 305-357).

Husserl was not an exception in his attempts to combine mathematics and Brentanist psychology. Brentano often discussed mathematical authors and topics in his lectures on logic that were familiar to Husserl due to his mathematical studies and hence presented a very congenial theory and method for his early work. Indeed, owing to this fertile ground, most prominent Brentanists sooner or later engaged with the philosophy of mathematics: Stumpf's habilitation essay was titled *On the Foundations of Mathematics*,¹ Benno Kerry wrote on mathematics throughout the 1880s, and Christian von Ehrenfels published his article *On the Philosophy of Mathematics* in 1891, the same year as Husserl's *Philosophy of Arithmetic*. This suggests that we might well speak of the development of a Brentanist philosophy of mathematics in this period.²

Let us look in more detail at Husserl's aims and methods in the *Philosophy of Arithmetic*. In his first works the young Husserl tries to provide a philosophical-psychological underpinning for Weierstrass' project of arithmetization of mathematical analysis.³ Husserl's goal is to secure a foundation for mathematics through a psychological analysis of the origin and content of the concept of number.⁴ This method of conceptual analysis leads him to the definition of number as multiplicity of units and to a discussion of the proper and symbolic presentations of these basic concepts. In the *Philosophy of Arithmetic*, Husserl provides a detailed account of the reflective acts needed to arrive at the construction of the proper concept number. In short, the proper concepts of multiplicity and number are obtained by reflecting on the collection of presented objects, each considered as "something in general" (*Etwas überhaupt*) and all collectively connected by the conjunction "and". Husserl then characterizes the proper concept of number in general as "one and one and one etc.", in which each element is considered only as identical with itself and (numerically) distinct from all others.

¹ Recently published in Stumpf (2008).

² Also consider Ierna (2011a). Within the School of Brentano there must have been an awareness of such a shared interest, which is clear from the fact how the Brentanists reacted to and built on each other's work. For instance, Von Ehrenfels refers to Husserl's *Habilitationsschrift* in his article and among the 17 reviews of the *Philosophy of Arithmetic*, three were by Brentanists (see Ierna (2011b), forthcoming).

³ Husserl (1887, pp. 4 f.), Husserl (1970, p. 291 f.), Husserl (2003, p. 307 f.), also see Ierna (2005, pp. 39, 51 f.) and Miller (1982, p. 1 ff. especially 4).

⁴ Husserl (1887, p. 7), Husserl (1970, p. 294), Husserl (2003, p. 310).

This early account sounds very much like the later account of active genesis provided in the *Cartesian Meditations*:

If we inquire first about principles of constitutive genesis that have universal significance for us, as possible subjects related to a world, we find them to be divided according to two fundamental forms, into principles of active and principles of passive genesis. In active genesis the Ego functions as productively constitutive, by means of subjective processes that are specifically acts of the Ego. Here belong all the works of practical reason, in a maximally broad sense. In this sense even logical reason is practical. The characteristic feature (in the case of the realm of logos) is that Ego-acts, [...], become combined in a manifold, specifically active synthesis and, on the basis of objects already given (in modes of consciousness that give beforehand), constitute new objects originally. These then present themselves for consciousness as products. Thus, in collecting, the collection <is constituted >; in counting, the number; in dividing, the part; in predicating, the predicate and the predicational complex of affairs; in inferring, the inference; and so forth.¹

This matches quite well with Husserl's early description of the process, considering the proper concept of number as a result of a very literal active synthesis.

One is therefore entirely justified in referring to quantities and numbers as results of processes and [...] as results of activities, of "operations" of collecting and counting.²

Here, Husserl underscores that this is merely a psychological prerequisite, but from a later point of view we might be justified to see an early hint of the *Leistung* of constitution and active synthesis. However, in the *Philosophy of Arithmetic* Husserl does not just talk about the proper concept of number: what about the improper, symbolic concepts of number and quantity? And furthermore, since Husserl's first works explicitly mention "psychological analyses" and "psychological investigations" in their titles, what about an *analysis* of number as opposed to a *synthesis* of number?

The main inspiration behind the method of psychological analysis that Husserl applies to the concept of number in his early works is probably Stumpf, not only through his book *Über den Psychologischen Ursprung der*

¹ § 38 on "Active and passive genesis" in Husserl (1963, p. 111), translation from Husserl (1960, p. 77).

² Husserl (1887, p. 24), Husserl (1970, p. 307), Husserl (2003, p. 324). Compare Husserl (1891, p. 24), Husserl (1970, p. 28), Husserl (2003, p. 29).

Raumvorstellung (On the Psychological Origin of the Presentation of Space),¹ but also, and probably mainly, through his lectures on psychology in Halle.²

With the search for the *psychological origin* of a presentation we mean the search for the presentations out of which it was built and the manner and way of how it was built out of them. One will have to think at first of the solution of compounded presentations in simpler and simplest.³

As was quite common at the time,⁴ an analogy to chemical analysis is made:

We could call such a kind of investigation psychological analysis, in analogy to chemical analysis.⁵

Psychological analysis turns out to be a very fundamental operation for Husserl in the *Philosophy of Arithmetic*. Indeed, one could characterize the two kinds of presentations of quantity, i.e. proper and symbolic, also as synthetic and analytic. In the proper sense, we collectively gather the single elements together into a whole one by one: Husserl speaks of “*zusammenfassen*”⁶ and “[*in Eins*] *zusammenbegreifen*”.⁷ Contrariwise, in the symbolic sense, we first have an unanalyzed perceptual whole, a complexum,⁸ whose quantity character is given by higher order quasi-qualities (which we will discuss later on). Only through analysis can we distinguish the simpler elements of which it is composed. Counting in this second sense, means as much as analyzing.⁹ Following Stumpf, we can consider analyzing in the sense of distinguishing also as a form of defining, in the classical sense,

¹ Stumpf (1873).

² Husserl’s own notes of Stumpf’s lectures are preserved in the Husserl-Archives Leuven, in two volumes under the signatures Q 11/I and Q 11/II.

³ Stumpf (1873, p. 4).

⁴ This trend can be traced back at least as far as Kant, see Vaihinger (1922, p. 120 f.).

⁵ Stumpf (1873, p. 5).

⁶ Husserl (1891, p. e.g. pp. 112, 209), Husserl (1970, pp. 104, 188), Husserl (2003, pp. 109, 198). In the english translation *Zusammenfassen* is translated in various ways, see Ierna (2008, p. 56).

⁷ Husserl (1891, pp. 102, 218), Husserl (1970, pp. 95, 195), Husserl (2003, pp. 100, 207).

⁸ Compare Stumpf (WS 1886/87, p. 36): “What we firstly perceive, is composite [*zusammengesetzt*]”.

⁹ See Husserl (1891, p. 241), Husserl (1970, p. 215), Husserl (2003, p. 227).

which leads to the simplest elements of which a whole is composed.¹ These ultimate elements are then *eo ipso* also the most general ones.² Of course, there is a fundamental difference between natural scientific “analysis”, which allows the actual, material decomposition into parts, and psychological analysis, which is distinctional, i.e. abstractive.³ Husserl also couples analysis and abstraction, pointing out that these are a matter of attention and noticing, specifically of noticing differences, quoting Stumpf as support.⁴

The term “distinguishing” [*Unterscheiden*] is also used in another sense, which is connected with *analysis*. In this sense, “distinguished” indicates what has been brought forward and particularly noticed, and “distinguishing” means as much as “isolating”, “analyzing”.⁵

Analysis allows us to distinguish the elements of a whole, and then our interest makes us particularly notice some parts and disregard others. Noticing and retaining certain parts and not others means abstracting: “To disregard or abstract from something just means: not to pay any special attention to it.”⁶

The abstraction to be performed, can now be described in the following manner: somehow determined individual contents [*Einzelinhalte*] are given in collective connection; by abstractively passing over to the general concept, we do not regard them as thus and so determined contents; the main interest concentrates on their collective connection, whereas they themselves are considered and regarded only as contents-whatsoever [*irgend welche Inhalte*], each as *anything whatever* [*irgend Etwas*], *any one* [*irgend Eins*].⁷

¹ Stumpf (WS 1886/87, p. 46 f.), where an analogy to chemical analysis is made: “Analogy of psychological analysis with the chemical, in that it becomes that more difficult, as the components get simpler”.

² Stumpf (WS 1886/87, p. 35), with further analogies to chemical analysis.

³ Stumpf (WS 1886/87, p. 47): “There certainly is a major difference between psychological and physical [*naturwissenschaftlichen*] analysis, at least in many cases. In physical analysis the parts can always be really isolated. [...] In matters of psychology such taking apart, such isolating, is not practicable in reality [...] So when we speak of a separation [*Trennung*], of analysis, this is performed in the manner of so-called abstraction”.

⁴ Husserl refers to Stumpf (1883, p. 96): “*Noticing a plurality we want to call analysis.*”

⁵ Husserl (1891, p. 59), Husserl (1970, p. 56), Husserl (2003, p. 58).

⁶ Husserl (1891, p. 85), Husserl (1970, p. 79), Husserl (2003, p. 83).

⁷ Husserl (1891, p. 85), Husserl (1970, p. 79), Husserl (2003, p. 83).

In the *Logical Investigations* Husserl will develop a much more detailed and nuanced conception of abstraction and attention,¹ then reject part of this earlier conception of abstraction based on attention, as it was also formulated i.a. by Stumpf and Meinong.²

Psychology and psychologism

Husserl's account in the *Philosophy of Arithmetic* might indeed sound quite psychologistic, but we have to take into consideration two very relevant points here: firstly, besides the proper concept of number, Husserl also provides a symbolic concept of number, based on the system of number signs, and explicitly states that mathematics does not use the proper concept of number.³ Hence, appealing to Husserl's psychological analyses in the first part of the *Philosophy of Arithmetic* does not by itself constitute an argument to label him a full-blooded mathematical psychologist. Secondly, we have to consider what kind of psychology and psychological method it is that he applies here. As we saw, in this period Husserl bases his theory and method mainly on Brentanist philosophical psychology: "Prior to 1894 Husserl was without a doubt a whole-hearted disciple of Brentano. [...] One cannot emphasize enough what a thoroughly orthodox Brentanist he was."⁴ Here, it is of paramount importance to remark on the fundamental difference between genetic and descriptive psychology. Brentano formulated this in his lecture concerning *Descriptive Psychologie* as follows:

Psychology is also confronted with another task [besides the formulation of laws that regulate the (causal) coherence of body and soul, which is the task of genetic psychology]: to give clarity about what inner experience shows immediately; hence not a genesis of facts, but at first only a description of the field. This part is not psychophysical, but purely psychological. We must know in advance, what the facts look like: and this is shown by an internal perception of the psychical. When we want to describe this, we summon phenomena through iteration of the physical stimuli; in this sense we will also

¹ Husserl (1984, p. 220), in particular, compare points b and e.

² See Rollinger (1999, p. 159) and Rollinger (1993, p. 133 f.).

³ Husserl (1891, pp. 211, 297 f.), Husserl (1970, pp. 190, 262 f.), Husserl (2003, pp. 200, 277 f.).

⁴ Rollinger (1999, p. 7).

have to discuss the body. Otherwise only internal experience is considered. This field of psychology I call descriptive.¹

Hence, when Husserl discusses “the content and origin of the concept of number”,² this in no way implies first a psycho-physical, genetic account and only then and based thereon a descriptive investigation: Husserl’s concern with the question of the origin and content of the concept of number is placed entirely within the context of descriptive psychology.³ Inquiring about the origin of concepts in descriptive psychology means examining the contents contained in consciousness, not the sensuous stimuli that cause them psychophysically. A theory of the sensuous stimuli would belong to external perception and be a part of the natural sciences, which can only deliver hypotheses.⁴ Descriptive psychology, instead, claims that only inner perception can provide absolute certainty and evidence: “inner perception possesses another distinguishing characteristic: its immediate, infallible self-evidence”.⁵

Following Brentano’s method,⁶ Husserl provides descriptions, not definitions, of the phenomena in consciousness upon which the construction of concepts is based:

Firstly, we should remark that we are not concerned with a *definition* of the concept of multiplicity, but with a *psychological characterization* of the phenomena on which the abstraction of this concept is based.⁷

This goes quite directly against Frege’s strong warning in the *Foundations of Arithmetic* that one should not mix psychological descriptions and logical definitions:

When the author feels himself obliged to give a definition, yet cannot, then he tends to give at least a description of the way in which we arrive at the object

¹ Brentano (WS 1887/88, p. 4).

² Husserl (1887, p. 9), Husserl (1970, p. 295), Husserl (2003, p. 311).

³ See de Boer (1978, pp. 55, 60 f.).

⁴ See the *Thesen* in Husserl (1887), Husserl (1970, p. 339), Husserl (2003, p. 357): “Every natural law is an hypothesis”.

⁵ Brentano (1874, p. 119), translation from Brentano (1995, p. 70).

⁶ Brentano (WS 1887/1888), p. 4: “The task that is put before us is hence: description [*Beschreibung*] of what inner experience shows of the psychical. [...] Psychology is at all possible only on the basis of description [*Deskription*].”

⁷ Husserl (1887, p. 17), Husserl (1970, p. 301), Husserl (2003, p. 318). Italics in the original spaced.

or concept concerned. [...] For teaching purposes, introductory devices are certainly quite legitimate; only they should always be clearly distinguished from definitions.¹

Indeed, Husserl in the *Philosophy of Arithmetic* strongly opposed Frege in this respect and he did not retract this aspect of his critique. For Husserl, Frege's attempt to base arithmetic on formal definitions alone is fundamentally misguided. The most elementary concepts, such as unity, multiplicity, something, etc. cannot be formally analyzed or defined any further, hence, contra Frege, Husserl thinks we do need to apply another method: that of psychological analysis and description.

As soon as we hit on the ultimate, elementary concepts, all defining comes to an end. [...] Multiplicity and unity [...] are concepts that are entirely incapable of a formal-logical definition. What can be done in such cases consists just in pointing out the concrete phenomena from or through which they are abstracted, and clarifying the manner of this process of abstraction.²

With his approach to the proper concept of number, based on collecting and counting, Husserl follows Weierstrass as much as Brentano, but for Frege, this constitutes a slippery slope towards psychologism, and he will reject any such theory, lumping together all the approaches in the spectrum from J.St. Mill's "pebble and cookie arithmetic" to Weierstrass' project of arithmetization, including Husserl's psychological investigations. However, Husserl's attempt to provide an epistemological clarification of the foundations of mathematics by applying Brentano's descriptive psychology, does not amount to the kind of psychologism criticized by Frege. Nowhere are numbers turned into utterly subjective presentations or the laws of logic considered as empirical descriptions of how we think.

Moreover, Husserl does not only respect the distinction between psychological characterizations and logical definitions, but also between the psychological and the logical content of presentations. If we examine the process of psychological abstraction that Husserl uses, we see that it effects precisely the elimination of all contingent, subjective aspects of the process of collection and hence generates a purely logical object. We can, therefore, distinguish the logical and the psychological aspects of a *collectivum*, by

¹ Frege (1884, p. VIII), translation from Frege (1960, p. xx). This passage was marked by Husserl with a "NB" in the margin in his copy, conserved at the Husserl-Archives Leuven with signature BQ 144.

² Husserl (1891, pp. 130 f.), Husserl (1970, p. 119), Husserl (2003, pp. 124 f.).

abstracting from such contingent psychological aspects as e.g. temporal succession. Numbers are then generated by the iterative conjunction of objects considered only as “*Etwas überhaupt*”: the most general, i.e. empty, concept. Consider the following example provided by Husserl: when we collect A to D in succession, we pick them out one by one and collect them together in an *Inbegriff*.¹ We pick out A, then B, C, D, one after the other, but we could also start with D and go through the series backwards. The subjective experience is different, but the logical content is the same.

The phenomenon is the foundation for the meaning, but it is not the meaning itself. [...] In forming the presentation of the *Inbegriff*, we do not pay attention to the fact that changes occur in the contents during the process of collecting. [...] The *logical content* of the presentation is not at all: D, just past C, earlier past B, up to the most strongly changed A. Instead, it is nothing but (A, B, C, D).²

Husserl will repeat this distinction between the logical and psychological content of a collection in his lectures on passive and active synthesis:

We must distinguish between the collection itself as the meant plural, and the succession peculiar to [the process] of running through [the elements], that is, peculiar to the temporal sequence of the givenness of the colligated elements. [...] A genuine collective intention ... is fulfilled if each thing grasped has been grasped ... in any kind of sequence of a grasp that passes through [the elements] ... a second passing through all elements in a different sequence produces the consciousness of the same collection.³

With this example, that we find already in 1887 in *On the Concept of Number*⁴, Husserl shows that succession and time do not enter into the content of the concept of number, but are just contingent psychological prerequisites. The temporally modified phenomena are clearly distinguished from their logical content. We can abstract from, i.e. disregard, the psychological prerequisites and concentrate solely on the ideal logical content.

¹ Often translated as “totality”, sometimes translated as “collection”, I prefer to leave it untranslated here, on this see Ierna (2008, p. 57).

² Husserl (1891, pp. 28 f.), Husserl (1970, p. 31), Husserl (2003, pp. 32 f.)

³ Husserl (1966, p. 419), translation from Husserl (2001a), pp. 522 f.

⁴ Husserl (1887, p. 27), Husserl (1970, p. 309), Husserl (2003, p. 326).

Frege's accusations of psychologism are hence for the most part quite off target.¹

The topic of "Husserl and Frege" has developed into a major sub-genre in the secondary literature. Normally the origin of this topic is associated with Føllesdal's 1958 work,² but already during Husserl's lifetime the thesis was advanced that Frege's review would have turned him from psychologism to anti-psychologism by Andrew Osborn in 1934.³ Husserl's opinion of Osborn's work was extremely negative and dismissive. After Osborn's visit on June 10, 1935 Husserl wrote to Cairns that Osborn was not to be taken seriously as philosopher and after having read a scant few pages of his work, Husserl thought it would have been a waste of time to finish it.⁴ Any significant influence by Frege's review was then dismissed by Marvin Farber already in 1940.⁵ It resurfaced in 1957 in a conference on Husserl in Royaumont in a talk by Walter Biemel,⁶ who referred to Osborn, and then of course again with Føllesdal.

Regarding the issue of psychologism and Frege's influence, we can roughly distinguish two camps: on the one hand, scholars following Føllesdal, argue that in the early 1890s Husserl was still in his "psychologistic slumbers" and that Frege's 1894 review of the *Philosophy of Arithmetic* awakened him to anti-psychologism, on the other, various scholars, among which Mohanty and Hill,⁷ demonstrated that the review could not have been the reason for the changes in Husserl's position, since changes were already afoot in his development around 1891, i.e. before Frege's review. Their conclusion is that Frege did not significantly influence Husserl.

Here I would like to suggest that the terms on which this debate has been conducted might be too narrow. Føllesdal's fundamental question strongly limited the subsequent debate: "Did Frege influence Husserl's development during these decisive years (1891 - 1900)?" Føllesdal took all of Husserl's references to Frege in the *Philosophy of Arithmetic* as negative

¹ See e.g. Hill (2000). According to Tappenden (2006, p. 136), Frege's critique of Husserl might have been intended as a misguided indirect critique of Weierstrass.

² Føllesdal (1958, 1994).

³ In his dissertation, printed as Osborn (1934a), Ch. 4 and in Osborn (1934b, p. 378).

⁴ Husserl (1994, p. Vol. IV, pp. 313-315). Conversely, Husserl is pleased that Osborn's misconceptions provoked Cairns to publish again: "Then Osborn has not lived in vain".

⁵ Farber (1940, p. 12).

⁶ Biemel (1959b), translation in Biemel (1970).

⁷ See the discussion between Føllesdal and Mohanty in Dreyfus (1982). Also see Hill (2000) and Mohanty (1995).

and concluded that Husserl remained a convinced psychologist until the 1894 review. Føllesdal then looked for the first explicitly anti-psychologistic position, which we find in Husserl's 1896 lectures on logic.¹ Hence, the conversion should have taken place between the review and the logic lectures. Once Føllesdal took these dates as the bounds of a possible influence of Frege on Husserl, these became the terms on which the subsequent debate has been conducted. Indeed, also critics of Føllesdal's thesis, while arguing that other authors, such as Natorp,² Twardowski and Bolzano,³ or even James,⁴ could have had a major impact in 1894, hence de-emphasizing the role of Frege's review, stay within the bounds of Føllesdal's original question: 1891-1900.⁵

However, if we consider the way Husserl handled criticism of his work, a curious inconsistency emerges. In the cases of the early controversy with Voigt and his later reaction to Palàgy's book (essentially a long, negative, review of the *Logical Investigations*),⁶ Husserl responded quite strongly, defending his work from what he saw as distorting attacks. Moreover, he also wrote a vehement rebuttal⁷ to Adolf Elsas' review of the *Philosophy of Arithmetic*, which appeared in the same year as Frege's.⁸ This indicates that in 1894 Husserl still felt strongly enough about the *Philosophy of Arithmetic* to react to criticism. However, with respect to Frege's review, Husserl did not react at all. Indeed, when he took up his correspondence with Frege again a few years later, judging from Frege's replies, he did so in the same friendly tone as before the review, as if nothing untoward had happened.

While I would agree that Frege's *review* did not radically influence Husserl, I do not think that we can conclude from this that Frege did not influence Husserl at all. Most critics of the view that Frege's review influenced Husserl appeal to the *Philosophy of Arithmetic* or other texts from around 1891 (i.a. Husserl's review of Schröder) to support their counterpoint,⁹ but if Frege's influence would have been prior to that, this would undercut their interpretation and make the debate about the role of Frege's

¹ Published in Husserl (2001c).

² Kern (1964, p. 324)

³ Drummond (1985, p. 255 f.)

⁴ Schuhmann (1992, p. 137)

⁵ Similarly Mohanty (1982, p. 52).

⁶ See Husserl (1979, p. 73-91, 152-161)

⁷ Manuscript K I 52/1-2, unpublished

⁸ Elsas (1894).

⁹ E.g. Mohanty (1982, p. 44).

review much less relevant. Hence, the question we should rather ask, is: “Did Frege influence Husserl before 1891? ”.

The development of the *Philosophy of Arithmetic* and Frege’s influence

In examining Husserl’s position before the *Philosophy of Arithmetic* we approach the pre-history of phenomenology. Notwithstanding the almost 40.000 pages of Husserl’s manuscripts conserved at the Husserl-Archives Leuven, we have a lack of sources. Specifically, the most important text, the original version of Husserl’s *Habilitationsschrift*, is lost. When Husserl refers back to the *Philosophy of Arithmetic* in later works, he more often than not underscores that it was just an elaboration of his *Habilitationsschrift*. If we want to show an influence of Frege on the *Philosophy of Arithmetic*, we would have to compare it to the *Habilitationsschrift* and assess whether Husserl made significant changes or additions based on Frege’s works. While the *Habilitationsschrift* is lost, we do have some other texts that allow us to reconstruct it in part.¹ The most straightforward source we have, is the little booklet based on the first chapter of the *Habilitationsschrift*, namely the work we now know as *On the Concept of Number*. This text has been quite misleadingly published in the critical edition under the heading “original text of the first four chapters”. However, *On the Concept of Number* is not the whole *Habilitationsschrift* itself, but at most its first chapter,² and it was quite probably adapted for print, so as to present a coherent argument and conclusion. Hence, it should not be straightforwardly taken as an “original version” of anything.

Luckily, we have two other texts that allow us to say a great deal more about Husserl’s *Habilitationsschrift* and hence potentially about Frege’s influence before 1891: a summary of Husserl’s *Habilitationsschrift* prepared by his supervisor Stumpf³ and a lecture from the winter semester 1889/90.⁴ The lecture was given in January 1890, and is hence chronologically very close to Husserl’s letter to Stumpf of February 1890,⁵ which is often

¹ Such a reconstruction is attempted in much more detail in Ierna (2005).

² This is “the first chapter of a text, which will appear with publisher C.E.M. Pfeffer (R. Stricker) in Halle”, Husserl (1887, p. 64 n.), Husserl (1970, p. 338 n.), Husserl (2003, p. 356 n.).

³ Gerlach and Sepp (1994, pp. 171-174), translated almost entirely in Ierna (2005, p. § 3.1, pp. 24-30).

⁴ Husserl (2005b), English translation in Husserl (2005a).

⁵ Husserl (1994, p. I 157 ff.).

considered as the hallmark of a fundamental change and of the failure of his alleged psychologism.¹ The text of the lecture not only follows the general structure of the *Habilitationsschrift* as presented in Stumpf's summary, but even contains literal passages of *On the Concept of Number* and the *Philosophy of Arithmetic*.

Reconstructing the *Habilitationsschrift* on the base of these sources, shows that it quite certainly contained most of the material of chapters I-IV of the *Philosophy of Arithmetic*, probably chapter V and surely some parts of chapters VIII and X. Furthermore, it is highly probable that it also already contained central parts of chapters XI, XII and XIII. Instead, chapters VI, VII and IX would appear to have been written and added after 1887.

What does this tell us about a possible influence of Frege on Husserl? First of all, Frege is the single most quoted author in the *Philosophy of Arithmetic*. You will not find the same level of explicit, extensive engagement with his works in any other work after 1891. Not only is Frege the single most quoted author in Husserl's *Philosophy of Arithmetic*, but two-thirds of the references to Frege are precisely in the chapters that were probably added later and in which Frege is most extensively treated. In the other chapters we find references to Frege mostly in self-contained paragraphs that could also have easily been added later during the elaboration, as they generally do not affect the flow of the text and the argument.

This strongly suggests that Husserl did indeed introduce significant changes between the *Habilitationsschrift* and the *Philosophy of Arithmetic* based on his reading of Frege. The hypothesis of such an influence between 1887 and 1891 is strengthened by the fact that Husserl acquired Frege's *Foundations of Arithmetic* in 1887.²

In their early correspondence they never directly discussed the issue of psychologism, but they both explicitly remarked on the issue of influence. Frege is grateful to Husserl for having taken his works so extensively into account, more than anyone else had done at the time.³ Indeed, Husserl explicitly acknowledged and confirmed this in his answer, remarking on the "great stimulus and improvement" he derived from his reading of the *Foundations of Arithmetic*: "Among the many works which I had at hand during the elaboration of my book, I couldn't name any that I studied with as much pleasure as yours."⁴

¹ See Biemel (1959a, pp. 195 ff.) and Willard (1980, pp. 52, 63 ff.)

² Schuhmann (1977, p. 18).

³ Husserl (1994, Vol. VI, p. 108).

⁴ Husserl (1994, Vol. VI, p. 111).

Hence, breaking out of the bounds imposed by Føllesdal, I think we might be justified in concluding that Frege influenced Husserl before 1891 and that the debate about the review is hence rather less relevant to assess the matter. Neither is the *Philosophy of Arithmetic* hopelessly psychologistic, nor did Frege's review convert and save Husserl from psychologism. I feel that this is essentially very close to what Marvin Farber already stated much earlier:

Although Frege has been credited with the demolition of the *Philosophy of Arithmetic* and with turning Husserl away from his early position, that contention cannot be sustained by the facts. Frege did indeed successfully point out inadequacies in that work, but he by no means discredited it as a whole; and the fact that Husserl's confidence in his work was not seriously shaken is shown by the frequent references to it in his later writings. Indeed, a close study of the *Philosophy of Arithmetic* brings to light some of Husserl's fundamental descriptive interests, and presents in a simple form types of problems which his later and more developed descriptive technique reveals in their proper complexity. If one reads all of Husserl's writings consecutively, one cannot but be impressed by the continuity of his development.¹

Passive and active synthesis, analytic and synthetic numbers

Let us return then to the subject of passive and active synthesis in counting and in the constitution of properly and symbolically conceived numbers and quantities. Above we saw that Husserl's early account of properly conceived numbers, given by explicit counting of objects, matches the account of active genesis in the *Cartesian Meditations*. We briefly discussed Husserl's application of Brentano's and Stumpf's method of psychological analysis, but have not yet given an account of the *analysandum* itself. Properly conceived quantities are built up actively element by element and are the result of the process of collecting. Improperly or symbolically conceived quantities are identified as such, according to Husserl, thanks to their *Gestalt*.²

The concept of *Gestalt* is not usually associated with Husserl, but with Christian von Ehrenfels and his article "*Über Gestaltqualitäten*".³ However, as Von Ehrenfels reports at the beginning of his article, his technical use was

¹ Farber (1940, p. 12).

² This section is in part based on Ierna (2005) and Ierna (2009).

³ von Ehrenfels (1890).

inspired by Ernst Mach's "*Beiträge zur Analyse der Empfindungen*".¹ Independently from and probably even earlier than Von Ehrenfels, also Husserl developed a technical notion of *Gestalt*, likewise inspired by Mach, for complex, higher-order objects: the *Gestaltmoment* or *Einheitsmoment* is what enables us to intuit complex wholes at a glance, i.e. it enables us to immediately intuit quantities as quantities.

In the *Philosophy of Arithmetic* Husserl discusses the logical and psychological aspects of the exhaustive enumeration of a quantity (*Menge*) by counting. During the process of counting we intuit each member of the quantity by itself, but not the quantity as a whole. This would overwhelm our presentational capacity since we would have to present every single element by itself, as identical with itself and different from all others, and simultaneously as connected to the whole. Hence, we can only speak of the whole quantity in a symbolic sense.² How do we know then whether something is an enumerable quantity, without actually counting and thereby constituting it?

Only one way out can be imagined: there would have to be *immediately graspable indications* in the intuition of the sensuous quantity, through which the characteristics of being a quantity can be recognized, in that they indirectly warrant the possibility of completing the process described above. [. . .] Only if we may assume that the complexes of relations that span the whole quantity, all or single ones of them would fuse to fast unities, which would give *an immediately noticeable specific characteristic* to the whole appearance of the quantity, so to speak a sensuous quality of second order, it would be different: this quasi-qualitative characteristic, which, with respect to the elementary relations that cause it, would be the πρότερον πρὸς ἡμᾶς could then provide the respective cue for the association.³

For Husserl these higher-order "quasi-qualities" would correspond to the linguistic form of collective nouns such as swarm, flock, herd, etc. which add to the plural *simpliciter* the "quasi-quality" of a unitary whole. We see directly, without counting, that the plurality of objects constitutes an enumerable quantity and grasp it as falling under the singular collective concept.

¹ Mach (1886, 1914).

² Husserl (1891, p. 218), Husserl (1970, pp. 195 f.), Husserl (2003, p. 208).

³ Husserl (1891, p. 225), Husserl (1970, p. 201), Husserl (2003, pp. 213 f.) Italics in the original spaced.

In each of these examples [we speak] of a sensuous quantity of objects equal to each other, which are also named according to their kind. But not only this is expressed [...] but also a certain *characteristic constitution* of the unitary intuition of the whole of the quantity that can be grasped at a glance.¹

Husserl explicitly mentions Von Ehrenfels' article "*Über Gestaltqualitäten*", but only to point out his own priority and independence from him, though acknowledging their common source in Mach's *Beiträge*. Moreover, Husserl claims to have worked out his own theory already a year before Von Ehrenfels' article appeared.² Indeed, in a lecture of January 1890 dealing with the concept of number, Husserl uses the terms "*Gestalt*" and "*Gestaltmoment*", applying them to the symbolic presentation of collectiva:

Now, how does such a symbolic presentation come together? Let us make a random composition of dots on the blackboard or think a number of dots on a die and the like. What is the primarily given? Well, a certain configuration of the dots. A unitary intuition is present in which we can notice this *Gestaltmoment* that gives the characteristic impression to the whole phenomenon. This forms the unitary frame for the apprehending activity: we apprehend one element, then proceed to another, then to another again. The outer frame now, the *Gestalt*, the unitariness of the intuition is what spares us the effort to undertake the real collection and which makes possible a symbolic presentation of a multiplicity that is defined by this intuition.³

This analysis was taken over in the *Philosophy of Arithmetic*, but there Husserl changed his terminology from "*Gestalt*" to "*Figural Moment*" to distinguish it from Von Ehrenfels' usage. In chapter eleven of the *Philosophy of Arithmetic* Husserl develops the problem of symbolic intuition of quantities in great detail and there introduces the notion of figural moment to explain the apprehension of quantities as quantities without counting. The peculiar *Gestaltmoment* of quantities enables Husserl to introduce symbolically apprehended quantities and hence symbolically conceived numbers, the central topic of the second part of the *Philosophy of Arithmetic*.⁴ Instead of properly constructing a quantity by collecting and a proper presentation of

¹ Husserl (1891, p. 228), Husserl (1970, pp. 203 f.), Husserl (2003, p. 216). Italics in the original spaced.

² Von Ehrenfels treatise appeared in the third *Heft* of the 14th volume of the "*Vierteljahrsschrift für wissenschaftliche Philosophie*", i.e. the "quarterly journal for scientific philosophy", hence, presumably not before the second half of 1890.

³ Husserl (2005b, p. 298), English translation in Husserl (2005a, p. 299).

⁴ Also see Hopkins (2002).

its number by counting, we can see at a glance that a certain complex phenomenon is a countable quantity to which a number must correspond.

Later on, when writing a new preface for the second edition of the *Logical Investigations*, Husserl returns to this point, summarizing his position as follows:

The further question regarding the origin of improper presentations of quantities led to the “quasi qualitative or figural” moments constituted by the “fusion” of the relations of the content, the same, that Von Ehrenfels, led by quite different problems, called *Gestalt* qualities in his well-known 1890 treatise.¹

Indeed, Husserl will use Stumpf’s concept of fusion and mereology in the third Investigation,² positively referring back to his analyses in the *Philosophy of Arithmetic*³ and clarifying that he uses “fusion” in a broader sense than Stumpf.⁴

As Biceaga puts it in his recent book on *The Concept of Passivity in Husserl’s Phenomenology*: “the genesis of ideal objects, such as numbers, sets or states of affairs, is active whereas that of sensible configurations is passive”.⁵ As already suggested earlier, I think we can therefore characterize the two concepts of number, proper and symbolic, as synthetic and analytic. The proper or authentic numbers are generated by active synthesis, constructed as results of mental acts of collecting and counting. The improper or symbolic numbers, however, are generated through an analysis of a complex that is given as a perceptual whole thanks to its *Gestalt* qualities. Passive synthesis provides its unitary object-like formation, i.e. its quasi-qualitative property that makes it recognizable as a quantity at a glance. Only through explicit analysis can we assign a definite number to a symbolically conceived quantity.

In conclusion, I hope to have been able to elucidate some of the layers in the historical development of Husserl’s position. The theories in his first works are those that, in the progress of Husserl’s development, are at the

¹ “Sketch of a Preface, second fragment”, in Husserl (2002, p. 295).

² Consider i.a. Husserl (1984, pp. 240, 246-252).

³ Husserl (1984, p. 247 n.).

⁴ Husserl (1984, p. 249 n.), as he already had done in the PA. Husserl will use “fusion” in the LU also to indicate the intimate union of acts e.g. in the *Erfüllungseinheit*, i.e. unity of meaning fulfillment, see Husserl (1984, pp. 44, 47, 62).

⁵ Biceaga (2010, p. 18), compare Husserl (1966, pp. 341 ff.); Husserl (2001a, pp. 630 ff).

same time those most susceptible to revision and reinterpretation, as well as those progressively becoming the most mature and influential. I feel that it is important to try to identify the constant elements in his thought, that remain an issue for him throughout his career, and to examine them in their original context to better understand their value.

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