

Karl Bühler's Research Program and its Heuristics

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ABSTRACT

In psychology, Karl Bühler's ideas have had less attention than deserved. This might have to do with the implicit character of his research program. I will go through his work to show how it developed thanks to the heuristics and axioms that guided it. In several of Bühler's publications he used the phrase program of research, both for his own work and to show his view of how psychology could develop and be united. Therefore, I feel confident to "rationally reconstruct" Bühler's work (Lakatos, 1971; Laudan, 1977; Watkins, 1984). First, I will briefly remind the readers of Lakatos', Laudan's and Watkins' theories of research. I discuss the hard (or metaphysical) core of Bühler's program (the primacy of Gestalt) and the heuristics that seem to have guided him: the heuristic of trinity and the heuristic of psychology as a life science. I will argue how they apply to his program of research. This will shed new light on the debate between the senior Wilhelm Wundt and the young Bühler in 1907 (Bühler, 1907, 1908a, 1908b, 1908c; Wundt, 1907, 1908).

El Programa de Investigación de Bühler y su Heurística

RESUMEN

En psicología, las ideas de Karl Bühler han tenido menos atención de la que merecían. Esto podría tener que ver con el carácter implícito de su programa de investigación. Revisaré su trabajo para mostrar cómo se desarrolló gracias a las heurísticas y axiomas que lo guiaron. En varias de las publicaciones de Bühler usó la frase programa de investigación, tanto para su propio trabajo como para mostrar su visión de cómo la psicología podría desarrollarse y estar unida. Por lo tanto, me siento confiado para "reconstruir racionalmente" el trabajo de Bühler. En primer lugar, recordaré brevemente a los lectores las teorías de investigación de Lakatos, Laudan y Watkins. Analizo el núcleo duro (o metafísico) del programa de Bühler (la primacía de la Gestalt) y las heurísticas que parecen haberlo guiado: la heurística de la trinidad y la heurística de la psicología como ciencia de la vida. Argumentaré cómo se aplican a su programa de investigación. Esto arrojará nueva luz sobre el debate entre el mayor Wilhelm Wundt y el joven Bühler en 1907.

Karl Bühler's Research Program and its Heuristics

Karl Bühler (1879-1963) was an eminent and well-known psychologist in his time, till the *Anschluss* of the Federal State of Austria into the *German Reich* in 1938. But now he is relatively

unknown among psychologists. This is strange since he has been the teacher of, among others, Konrad Lorenz, Egon Brunswik, Paul Lazarsfeld, Karl Popper and even, Ludwig Wittgenstein. He is known and respected in linguistics, semiotics, phonetics and other human sciences. Because he was the professor and thesis

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supervisor of Karl Popper he attracted my attention. Before long I wondered why he is not well known in psychology. I read more and more of his work. This made the puzzle even larger, because his work is very interesting and has been an inspiration to many without, however, “making school”. My answer to the question why he isn’t well known is that academic psychologists don’t appreciate the history of their field¹. In the case of Bühler, it has to be admitted it is hard to recognise the threads that make a “logical” sequence of his published ideas into a history. At most psychologists want to hear about inspiring sources and predecessors, not about rivals and competition of theories long gone². That is why Bühler’s ideas need a “rational reconstruction”.

In this article I use of the work of Imre Lakatos, Larry Laudan and John Watkins. Reading two of his most important works, his *Krise der Psychologie* (Bühler, 1927) and his *Sprachtheorie* (Bühler, 1934b) it is obvious there is a continuity in the approach. In various places he says so himself. The continuity seems simple at a first glance: he relied on three aspects that united what was, in his time, ignored as a unity. In his *Krise* he tried to resolve conflicts between opposing schools of psychology that claimed to have the one and only right answer to psychology’s problems. In his *Sprachtheorie* he showed how language must be understood as having three integrated functions. I will elaborate on that later in this article. First, I will discuss how research programs may shed light on how Bühler developed his ideas, and where he got them from.

Research Programs

Why Use “Research Program”?

It is always possible to find in the scientific and philosophical literature texts that appear to have been the inspiration if not source of the ideas of an important thinker. For Bühler you could mention Husserl, Stumpf, Selz, and Külpe; Nietzsche, Schopenhauer and Kant; Aristoteles, Plato, even Goethe, and all the rest. A citation or two per scholar would do. Or would it? I think it wouldn’t. For example, according to Ellenberger (Ellenberger, 1970, p. 543) Nietzsche was an important inspiration for Freud. However, we later learned from his letters to Fliess, that Freud was too lazy to read Nietzsche (Masson, 1985). Moreover, his *Traumdeutung* had already been published, months before Freud wrote Fliess he got possession of Nietzsche’s work (Panhuysen, 1990).

Although we cannot accuse Bühler of laziness, the same could be the case with Bühler and how he developed his research program. Bühler used the term program for psychology frequently, especially in his *Krise der Psychologie* (1927). He was interrupted in the late thirties because of the *Anschluss*, but he wished to contribute to the “*Axiomatik der Psychologie*” and “*die einen Endgegenstand der Psychologie*”, the unification of psychology (Vorwort of Bühler, 1927, p. IX). So, if Bühler used the idea of a *program* for psychology, why not do so as well. Also, Popper was a student of Bühler; later Lakatos was a close colleague of Popper at the London School of Economics. He was an important contributor to the development of Popper’s philosophy of science. Lakatos’ “methodology of scientific research programs” tried to resolve the conflict between Thomas Kuhn’s theory of the structure of scientific revolutions and Popper’s versions of falsificationism (Kuhn, 1962; Popper, 1959, 1963, 1972).

I use the term research program a little more loosely than Lakatos (1971). I also use the twin of his methodology, the “methodology of historiographical research programs” (Lakatos, 1971). His is a fruitful approach to get a rational and criticisable understanding of how ideas develop, although I realise most psychologists seldom use it, if they know it at all³. Lakatos’ methodology of scientific research programs and historiography:

- emphasises the competition with rivalling theories,
- emphasises empirical *and* conceptual problems that need to be solved as sources for advancement (more than p-values of experimental data and the “null ritual” do),
- helps to reconstruct how ideas have developed *and* have dealt with opposition *and* empirical difficulties,
- helps to recognise where rivals ignore and do not quote what was discovered first,
- respects if necessary but not compulsory the (critical) role of the local situations scholars are in,
- does more than look at citations of works researchers *may* have read, or *suggest* to have read, but tries to recognise *what* the effect of their alleged reading was in their theorising,
- marks “progress in the theory of scientific rationality ... by discoveries of novel historical facts, by the reconstruction of a growing bulk of value impregnated history as rational” (Lakatos, 1971, p. 133).

The Structure of Research Programs

Briefly: a research program comprises a hard (or metaphysical) core of fundamental assumptions or axioms (Lakatos, 1970, 1971, 1976; Watkins, 1984, 1989). Some of them have heuristic value, although they are neither verifiable nor falsifiable (Van Hezewijk,

¹ For more motives to ignore history of psychology, see also Mülberger’s comments (Mülberger, 2016) on Smith (2016).

² Only one example. Blumenthal (1975/2002) discussing Wundt’s method, his theoretical system and psychophysical parallelism, his emphasis on volitional processes, his psycholinguistics, his here-factor theory of affect, and his *Völkerpsychologie* without mentioning Bühler. He even ignored the polemics with Bühler: “Wundt promoted the cause of experimental psychology more through accomplishments in his laboratory than through polemics.” (p.67). As we will see shortly below, Wundt and Bühler in more than one way opposed each other and discussed their approaches in almost 100 pages, filled with polemical phrases.

³ Although Toomela mentions six different uses of “history of psychology”, he doesn’t mention Lakatos’ methodology of scientific research programs or methodology of historiography (Toomela, 2016). I do agree though that there are not many examples of it (one example is Urbach, 1974), there could have been many more. A promising article in *American Psychologist* did not have much follow up (Barker & Gholson, 1984).

1985; Watkins, 1957, 1958, 1975)⁴. As John Watkins showed not all statements implied by scientific theories are verifiable or falsifiable. Nevertheless, they can be important in a scientific research program. Metaphysical statements have an influential role as implied ontological conjectures or “existential statements” (of the form in predicate logic $\exists x$) or as heuristics. For instance “unconscious determining tendencies exist” (an existential statement) or “For every action there is some reinforcement that conditioned it”, or “For every event there is some cause”, or “For every meaningful act there is some reason” (heuristics that in predicate logic have the form $\forall x \exists y$). These metaphysical but influential statements are logically implied⁵ by theories: “I take it for granted that a theory, realistically interpreted, typically asserts the existence of those unobservable entities that it invokes in its explanations of phenomena” (Watkins, 1984, p. 195). They are not the product of imagination or religious dogma, they are the consequence of a corroborated, falsifiable theory. They define the unobserved entities that help explain what needs explanation and suggest how to proceed to get new ideas for better theories.

Together with auxiliary assumptions they lead to new hypotheses. The hypotheses, together with observation theories or measurement assumptions, will produce predictions. Predictions plus initial conditions, realised, for example, in experiments, clinical trials or observation opportunities, result in *expected* research outcomes that will have to be confronted with *obtained* results.

Following Laudan, I add that the hard core need not be so hard it can't change. Like a skeleton it can grow and to some extent bend (Laudan, 1977). This implies that there is more to development in a scientific research program than experiments. Thus, the term scientific needs to be relativized such that not only the physical sciences can claim scientific rationality. Fundamental assumptions in the hard core or skeleton can, for instance, *expand* or be *stretched*.

One can consider the approach of Lakatos, Laudan, and Watkins as giving answers to the classic Kantian question “How is scientific knowledge (psychology, physics, biology etc.) *überhaupt* possible?” Their focus is on the development of theories. But especially Watkins' way of identifying the metaphysical core of a research program resembles Kant's suggestions.⁶

⁴ Existential statements like “Godot exists” or “There is gravitational attraction” are not falsifiable but verifiable: you may have to wait for Godot forever, unless he shows up for verification. Universal statements are not verifiable but falsifiable. “All swans are white” is falsified when a black swan appears. “For-all-x-there-is-some-y-statements” ($\forall x \exists y$) are neither verifiable (because of the $\forall x$ part), nor falsifiable (because of the $\exists y$ part); for instance, “All events have some cause or other”.

⁵ Finding the logical implications is complicated. Watkins (1975) suggested to use “Ramseyfication” of theories to find non-empirical statements necessary for a theory to be testable. Later Watkins (1984) proposed to “think of a Ramsey-sentence TP of a theory T as representing the latter's empirical content” (p.193) and to identify the hard core TH as “those [axiomised] consequences of T ... in which occur only theoretical [unobservable] predicates” (p.194). For present purposes the quoted description will do.

⁶ However, Watkins explicitly warns to not continue reading his book when expecting a “rehabilitation” of synthetic a priori truths (Watkins, 1984, p. 10). See also the discussion of Sturm, and Sturm and Mülberger on the “Kantian therapies for the crisis in psychology” by Popper and Bühler (Sturm, 2012; Sturm & Mülberger, 2012)

Heuristics: negative and positive

As Larry Laudan reminded, “One useful way of defining heuristics is to say that it is concerned with identifying the strategies and tactics that will accelerate the pace of scientific advance.” (Laudan, 1981, p. 5; Worrall, 1978).

Heuristics help scientists to focus on progress and problem solving in knowledge rather than to validity and eternal truth. They profit from the strategies and tactics available at the various levels of action and thinking in research and knowledge development. Heuristics suggest how to progress without changing the hard core.

All the parts of the structure surrounding the hard core (auxiliary assumptions, measurement devices, experimental results) can be seen as its protective belt. When predicted results differ from obtained results, one can search for errors in the protective belt. The negative heuristic suggests beginning at the exterior parts of the protective belt to find where to make improvements, by changing the measurement devices, changing auxiliary assumptions, etc..

The positive heuristic suggests how to solve conceptual problems: where to find new consequences, how to get more precise theories, or introduce improvements in measurement, *even when at that moment there are no empirical difficulties*. It may also find new assumptions that apply to new fields. For there may be independent reasons to improve within the research program, for instance, because we want to expand its scope.

As we will see, we can find both negative and positive heuristics in Bühler's research program.

The hard core of Bühler's Research Program: Gestalt Theory is More Than the Sum of Gestalt Psychological Parts

I now turn to Bühler to discuss the hard core and heuristics of his research program. What we can see as his research program developed together with what were his heuristics and the implied ontology.

In 1903 Karl Bühler promoted on a medical thesis, supervised by physiologist Johannes von Kries. He focussed on Helmholtz' colour theory and the limits of the eye's adaptation to light and dark. He became interested in psychological questions. His second doctorate in philosophy was a critical examination of the psychology of Henry Home. The Scottish philosopher was one of the major proponents of teleology in the 18th century (Bühler, 1905/2015), using teleology to justify psychological laws and ethical principles. What a thing is suitable for, is its purpose; so the higher purpose should explain the psychological functions they serve, according to Home.

As we will see, during his career Bühler remained interested in how to deal with teleology in psychology. But he wasn't a dedicated follower of the teleology fashion. He rejected teleology, considered by Home as the flip-side of causality, and as the ultimate ground for Home's psychology. Bühler suggested Home could have accepted the idea of psychic *functions* as an alternative to strict causality:

Man könnte sich denken, er [Home] lasse nach berühmtem Muster der Seele eine reihe von Funktionsformen angeboren sein, die in Tätigkeit kommen, sobald die äusseren Sinne den Vorstellungsstoff

liefern, und schreibe dann der Seele die Fähigkeit zu jene allgemeinen Wahrheiten diesem Funktionsspiele vermittels ihres inneren Sinnes abzulauschen.⁷(Bühler, 1905/2015, p. 96).

The Gestalt qualities of thought processes

Two years after his psychology thesis Bühler published experimental and theoretical work on thought processes (Bühler, 1907). He now was a member of Külpe's *Würzburger Schule*, and got involved in the broad discussion in experimental psychology about investigating the relation between psychology and epistemology. The views were still dominated by the elementarism and instrumentalism inspired by Ernst Mach, and by the associationism in the theory and experimental method of Wilhelm Wundt. The Würzburgers (and also Carl Stumpf), however, criticized these approaches. Bühler soon arrived at the forefront of the debate⁸.

He not only was convinced that thought processes carry an "eminent teleological character" (p. 141) although he rejected the universal, full-blown teleological world view of Home. Disagreeing with Wundt, he claimed that, when asked to solve an intellectual problem, we know already what the correct result will be while the process of thought has not yet been completed. We are convinced, for instance, that we know the solution to a problem, although we haven't yet answered the task ("*Aufgabe*") in its details. The "*Aufgabe*" creates a mental attitude (*mentale Einstellung*⁹) that directs thought processes to the appropriate thought. Comparing and remembering thoughts appears to be effortless, much easier than associationism could explain. Early in his career, Bühler said knowing what the correct result of a thought process will be, is a case of *quasi* teleological observations.

I cannot discuss much of his early work on thought processes (Bühler, 1907, 1908b, 1908c, 1934b). But it is obvious that already early in his career, he was a Gestalt *theorist*. To quote just a few of his claims: "... that one cannot interpret the experience of a thought as a simple sum of images." (1907, p. 151). Or "a thought is not ... a dark or semi-conscious sum of parts, but a clear unity" (p. 153). "... that a thought is a whole that only contains non-independent parts, parts that are ... not self-contained." (p.156)¹⁰.

More precisely Bühler may have been convinced that the Gestalt experience in thought processes was a *bridge* between the sense data and the actual thinking (Weinhandle, 1974, as cited in Lebzeltner,

1969, p. 17). Neither were sense data the atoms of thinking (what Wundt claimed), nor were thoughts solely Gestalts (as claimed by the Gestalt psychologists), nor were thoughts always image-like (again contra Wundt).

The aforementioned knowing in advance what the correct result of thought process will be, is intertwined with the Gestalt character of thought. But it is not the same, according to Bühler. So although the claim that Gestalt qualities exist in thought processes can be seen as the hard core of his program, it was at the same time a heuristic. He used it as the bridge in what was a conceptual problem he had with both Wundt and the Gestalt psychologists in Berlin. I will come back to that later.

He also referred to what he later famously called the *Aha-Erlebnis*: Another domain of rule consciousness might be the area of "shape qualities". When I look at the complex of lines of a complicated mathematical figure, at first knowing nothing about them, and then suddenly "realising" what it is about them, what has "dawned" on me? Obviously, the meaning of the figure; and this meaning is in all cases something mental, in many nothing other than its law. ... Something similar happens when I suddenly "understand" the construction of a machine or the plan of a building." (Bühler, 1907, pp. 169-170)¹¹

In his first of three studies of thought processes (Bühler, 1907) he criticised Wilhelm Wundt's associationism and elementalism. He supported his views with an experimental approach that conflicted with Wundt's canons of experimental research in psychology. It made him famous among psychologists in the early years of the century. Almost immediately Wundt wrote 59 pages to respond to the criticism and discuss the approach of Bühler and his Würzburg colleagues. I will discuss their confrontation later in this article.

Gestalt Perception

Gestalt phenomena kept his interest during much of his life, not only in relation to thought but also in language (Eschbach, 1992, 2012). Soon after his publications on thought he started research on Gestalt *perception*. His "experimental studies on psychological and aesthetical analysis of space and time" where published under the main title *Die Gestaltwahrnehmungen* (Bühler, 1913). How do we perceive, identify, and compare simple figures (squares, rectangles, lines, curved lines, triangles, etc.) in different orientations and sizes? On first sight, are two given elements in the figures the same, do they resemble each other, are they different, in what respect, etc.?

When we hear a melody, how can we compare the tones of melodies in a different key as belonging to the same melody? As a

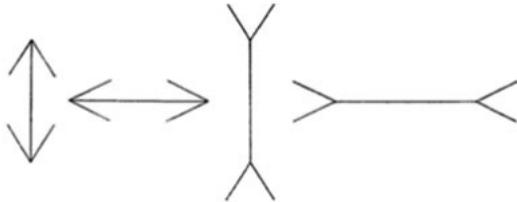
⁷ "One could imagine that he [Home], according to the famous model, allows a series of functional forms to be innate to the soul that come into action as soon as the external senses provide the material for the representation, and then attributes to the soul the ability to eavesdrop on those general truths of this functional play by means of its inner sense." (my translation, rvh)

⁸ Humphrey (1951) offers a very thorough introduction to the research and theories of thinking (and thought) of the Würzburger School, among others (Wundt, Gestalt, Selz). His chapter on language and thought (VIII), however, completely ignores Bühler's *Sprachtheorie*.

⁹ Due to Titchener, *Mentale Einstellung* often is translated as mental set. Humphrey (1951) makes it clear "mental attitude" is more appropriate.

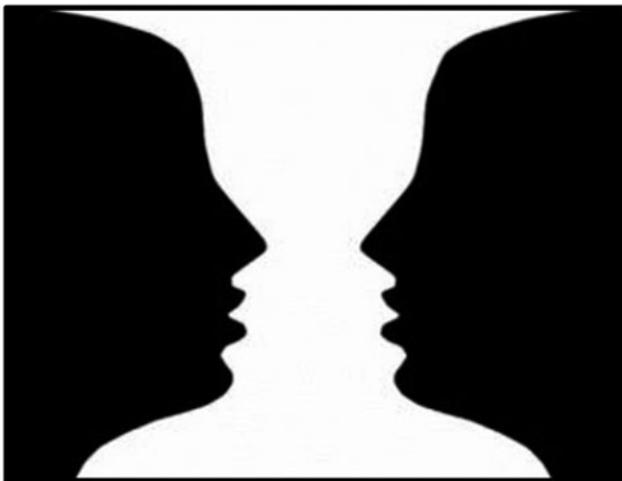
¹⁰ The latter quote is directed against Ernst Mach's separation of the phenomenal and the physical facts: "dass eine einfache Beziehung zweier Objekte für den Verstand nicht auch eine Ähnlichkeit der Empfindung bedingt" (Mach, 1886:89).

¹¹ I translated the following sentences: "Eine andere Domäne des Regelbewußtseins dürfte das Gebiet der »Gestaltqualitäten« sein. Wenn ich auf den Linienkomplex einer komplizierteren mathematischen Figur hinschaue, erst nichts mit ihnen anzufangen weiß, und mir dann plötzlich »aufgeht«, was es mit ihnen für eine Bewandnis hat, was ist mir da »aufgegangen«? Offenbar der Sinn der Figur; und dieser Sinn ist in allen Fällen etwas Gedankliches ... Etwas Ähnliches liegt vor, wenn ich plötzlich die Konstruktion einer Maschine oder den Plan eines Bauwerks »verstehe«."

Figure 1. Lipps' Bended lines illusion**Figure 2.** Müller-Lyer illusion

resembling melody? As the same melody in a different rhythm? How can a judge decide if a song has been plagiarised?

Nine years later, he published his studies on how colours are perceived (Bühler, 1922). Now the role of Gestalt theory seems more obscure because there are various grounds that a colour can be a figure to, and there are numerous ways a colour can be a ground. Bühler discusses how colour perception, including colour constancy, depends on, among others, the air-light (*Luftlicht*) through which the colours of objects reach the observer, on the object of which a colour is a property, *and the other way around*, on how illumination affects colour and its perceived intensity, and on the role of colour in art.

Figure 3. Rubin's Figure - Ground Reversal

He shows that what may be called the “ground” of seeing a colour as a “figure”, is more elaborate than what Gestalt psychologists would have called it. On the one hand, his research focusses on the factors that affect how colours appear to us. On the other, it shows how many grounds a figure can be considered to have. Bühler observes that what looks like empty space is not empty at all. There are many small particles of dust in the air through which a colour

reaches our eyes. Not to speak of what happens when Sahara dust, fills the air.

The distinction between figure and ground is well known as a Gestalt principle in perception. If a thing has a shape, it will be seen as a figure against the background of a frame without shape, or at least a vague shape. The well-known reversals of figure and ground, introduced by Rubin (1915) (Figure 3), highlight how the roles of figure and ground can be reversed under certain circumstances. The conditions for reversal and other features of the figure-ground relation (size, colour, shape, form of background, degree, or organization of figure versus ground, the dark-light or light-dark effects, etc.) were studied especially by the Berlin group (Wertheimer, Köhler, Koffka, von Hornbostel in music).

Bühler always kept and professed his respect for Carl Stumpf, but his relationship with the other Berlin Gestalt psychologists was less cheerful. In a note that was published posthumously (Bühler, 1969b), Bühler indicated that Max Wertheimer's son, Michael, had ignored both Christian Ehrenfels' *Über Gestaltqualitäten* (Ehrenfels, 1890) that started the Gestalt perception research, as well as his own research on Gestalt perception (Bühler, 1913; Ehrenfels, 1890). In fact, in some publications by the Berlin Gestalt psychologists, almost all of Bühler's work is ignored, especially his experimental research on Gestalt perception of quadrangles and of tone sequences he did from 1909 to 1912 (Bühler, 1913). Bühler also discussed the psychophysical parallel axiom that was adopted and briefly made famous by Gestalt psychologists from Berlin and Frankfurt. Bühler already there expressed his doubts. Bühler's work on Gestalt perception was published years before Köhler (1920; Wurtz, 1961) and Koffka (1925) published theirs. In much later publications Köhler and Koffka mentioned Bühler a few times (Koffka, 1935/1955/1962; Köhler, 1929). Only a few references to his work on language can be found (Bühler, 1934b, 2011/1934). Bühler complained about the selective practice of (non)quoting, not only of himself but also of, for instance, Otto Selz' work (Bühler, 1926a). Von Allesch in his Ph.D. Thesis never mentioned Bühler's work on *Die Erscheinungsweisen der Farben* (Bühler, 1922) while Von Allesch' thesis' title was *Die ästhetische Erscheinungsweise der Farben* (von Allesch, 1925). Also, Max Wertheimer's famous *Productive Thinking* (Wertheimer, 1945/1957) didn't even mention Bühler's works on thinking and its processes (Bühler, 1907, 1908b; 1908c Bühler, 1909 #3944) nor on what was published by the *Würzburger Schule*, although Wertheimer did his Ph.D. with Oswald Külpe in Würzburg (Ash, 1995).

Gestalt Linguist

While still working on colour perception his first publication on language (Bühler, 1909/2012b) started a long series that continued till 1937, the year he had to emigrate¹². Most psychologists will relate Gestalt theory to the Gestalt psychological approach in visual, motion and musical perception. But language has its Gestalts too. In hearing speech, we hear groups of words as Gestalts, not as the sequence of

¹² (Bühler, 1923, 1928, 1931, 1932, 1934b, 1936, 1937; See also Eschbach, 2012 for more distributed articles and conference papers)

letters. Let persons hear recordings of words in which some letters (vowels), were left out, and hardly anybody will notice.¹³

Bühler's *Sprachtheorie* (Bühler, 1934b) is generally considered to be a great monument of linguistic theory. Language is analysed as a construction of Gestalts that are embedded in various levels, from phonemes and morphemes to stories. However, being able to analyse language constructions (*Sprachgebilde*) into elements does not imply that the details come first and build up to a word, a sentence, a conference paper¹⁴.

But *Sprachtheorie* is more than linguistic Gestalt theory. It also points at the dynamics of communication, emphasizing the “functionalism” of the “Organonmodell”. It refers to three axioms of language.¹⁵ Choosing the word *Organon* implies that language is an unembodied organ or function in a social and natural “field”. It shows Bühler's development from his early interest and criticism of Home's teleology to his (Bühler's) functionalism¹⁶. It also shows how, in language, many *unobservables* are implied as consequences of a metaphysical hard core that says Gestalts exist at various levels of perception and “mental production”, and the heuristic that suggests analysing the Gestalt into the elements that form the Gestalt qualities (and not to start with the elements).¹⁷

¹³ It even relates quite strongly to dialects, as I have experienced myself in learning Spanish and then, in the streets and the pubs, in understanding the Colmenar version of the Andalucian dialect, where among other things, all s's are dropped if appearing before a consonant or at the end of a word, if possible, *má o meno* [sic]. *Buscar* becomes *bu'car*, *Francisco* becomes *Franci'co*, *de meno' a má'*.

¹⁴ Levelt (Levelt, 1989) demonstrated that speaking goes from intention to articulation. For instance, he showed that when we want to utter a certain word or sentence – a Gestalt – and make a mistake, we first make the mistake and, after at least the first syllables of the next word, correct it immediately after hearing the error ourselves. So, there is first an intention to say something meaningful, a word or sentence, and after hearing it expressed we correct it if it was articulated wrongly. I want to say wasp, I pronounce *waps*, and correct myself half a second later.

¹⁵ I will discuss them shortly.

¹⁶ Bühler criticized Home's view that teleology as the basic principle of science would lead to the opposite of a causal world view. For if, for instance, a bodily part was supposed to have been created to serve the attainment of a certain goal, then this had to be part of a body that also served a certain goal, which body would be part of a person that serves a goal, which person would be part of a group or society or religion that serves a goal, which in the end leads to the thought that the world serves a certain goal. What goal? Whose goal? Says Bühler: “(It is claimed that...) the world has a purpose, a sense, a meaning, but not which one. For it is the logical property of goal relations, in which the determination of a single item or element exists through the whole, that the goal of a single phenomenon only can be known from the goal of the whole to which it belongs.” (Bühler, 1905/2015:32-33)

As indicated before, Bühler was convinced that thought processes carry an “eminent teleological character” (p. 141 of 1907). Of course, the *apparent* teleological character of thought and of language needs explanation. A pure and simple, elementaristic *causal* explanation of how we can produce linguistic items, from words to sentences to essays, novels, or poems, is hard to obtain. It is hard to imagine a chain of elements that caused, for instance Musil's novel *Der Mann ohne Eigenschaften*. So in his *Sprachtheorie*, where the *Organonmodell* was developed (Bühler, 1934a, 1934b), he suggests a kind of dynamic cascade model of figure ground relations, where elements in terms of phonetics, phonology, morphology, grammar, as well as semantics interplay to form Gestalts of meaning by referring to content (“*Stoff*”). In other words, the text already available (spoken, heard, written or read), the formation principles of orderly speech and thought (rules of grammar and reasoning) and the context of the intended content (to be) expressed, redirect the next linguistic step.

¹⁷ Fiorenza Toccafondi (2004) emphasizes how Bühler's *Sprachtheorie* also is an extended confrontation with the then contemporary positivists of the *Wiener*

There is no real teleology involved, but the apparent “eminent teleological character” is there, only locally, dynamically, and only for small Gestalt steps forward, depending on the level of detail of the intended linguistic utterance.

Ich stelle die These auf, daß jeder der drei Aspekte möglich und keiner von ihnen entbehrlich ist in der einen Wissenschaft der Psychologie. Aus jedem entspringen eigene, der Psychologie unentbehrliche Aufgaben, die sinnlos werden, wenn man ihn aufgibt; jeder fordert die beiden anderen zu seiner Ergänzung, damit ein geschlossenes System wissenschaftlicher Erkenntnisse zustande kommt; Gegenstand der Psychologie ist die noch *unbenannte* Einheit, zu der die Erlebnisse, das sinnvolle Benehmen der Lebewesen und ihre Korrelation zu den Gebilden des objektiven Geistes als die konstitutiven Momente gehören. *Das sind drei Umschreibungen für ein und dasselbe.* (Bühler, 1926c, p. 466 my translation and italics, rvh).¹⁸

Bühler as Gestalt biologist

In 1938 Bühler had to emigrate to the USA. Robbed from his Viennese academic, cultural and linguistic environment, he had a hard time to get acquainted to the new university culture. But then, after 15 years of silence, he published on navigation of ants and bees (Bühler, 1952). It was the first of several publications on – what we now call – ethology¹⁹.

In these studies, the Gestalt theoretical principles get a new approach. He made it clear that there is more to say about Gestalts than perception. He suggested Gestalts relate to meaningful behaviour of animals and humans. His interest in ethology should not surprise us. In his Vienna days Bühler had students who later became famous for their work in ethology: Konrad Lorenz and Von Uexküll²⁰. Nobel

Kreis, with Neurath, Carnap, Schlick and others. Especially Neurath and Carnap intended to get rid of the alleged metaphysics of meaning and of psychologism in science, a philosophy Bühler abhorred and forcefully rejected. See also my later remarks about the truth versus depth poles in science. Schlick had a moderate view and accepted an introspective perspective, at least as far as one's own mental states were concerned, although he did not accept its methodological role in psychology (See the discussion in his dissertation about Bühler's *Krise*, Popper, 1928/2006; Sturm, 2012).

¹⁸ Translation: I put forward the thesis that each of the three aspects is possible and none of them is dispensable in the one science of psychology. From each of them spring tasks of their own, indispensable to psychology, which become meaningless if they are abandoned; each calls upon the other two to complement it, so that a closed system of scientific knowledge comes into being; the object of psychology is the as yet *unnamed* unity, to which the experiences, the sensible behaviour of living beings and their correlation with the entities of the objective [products of] mind belong as the constitutive moments. *These are three descriptions of one and the same thing.*

¹⁹ (Bühler, 1953a, 1953b, 1960a, 1960b; Van Hezewijk, 2014)

²⁰ And more, in philosophy (Popper, Wittgenstein), in psychology (Brunswik). They nevertheless found their own ways. Popper's work is often seen as “positivistic”, but that is a mistake that can only be obtained when looking through the wrong, non-Gestalt lens of the nineteenth century. Remember that Popper was once called an evolutionary epistemologist (Campbell, 1974), to which Popper almost completely agreed. Wittgenstein, in his second phase of thinking, took the escape route towards analysing language *use* exclusively, which is only a minor aspect of Bühler's work on language.

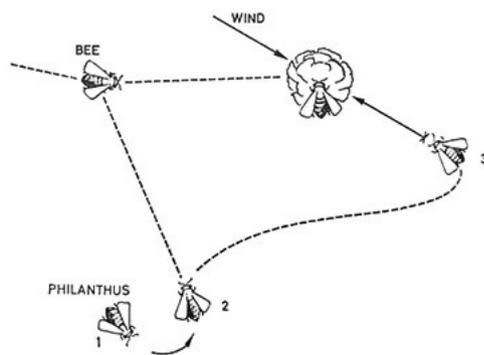
Prize winners Lorenz, Von Uexküll and companion Niko Tinbergen were the biologists that did *not* look at isolated biological elements, such as reflexes, anatomy, physiology. They studied the *organism* in its natural environment, its milieu. They were Gestalt biologists, what we now would call ethologists, and were heavily influenced by Bühler.

Uhren der Lebewesen

In 1960 Bühler published his last book, in German (1960a), in which he focussed on the Gestalt principles in biology. On the one hand, there are the principles of Gestalt perception, its input. The organism selectively perceives the Gestalts that are important for it. Their impact depends on the state of the organism, both because of its evolution as a species, and its development and life history.

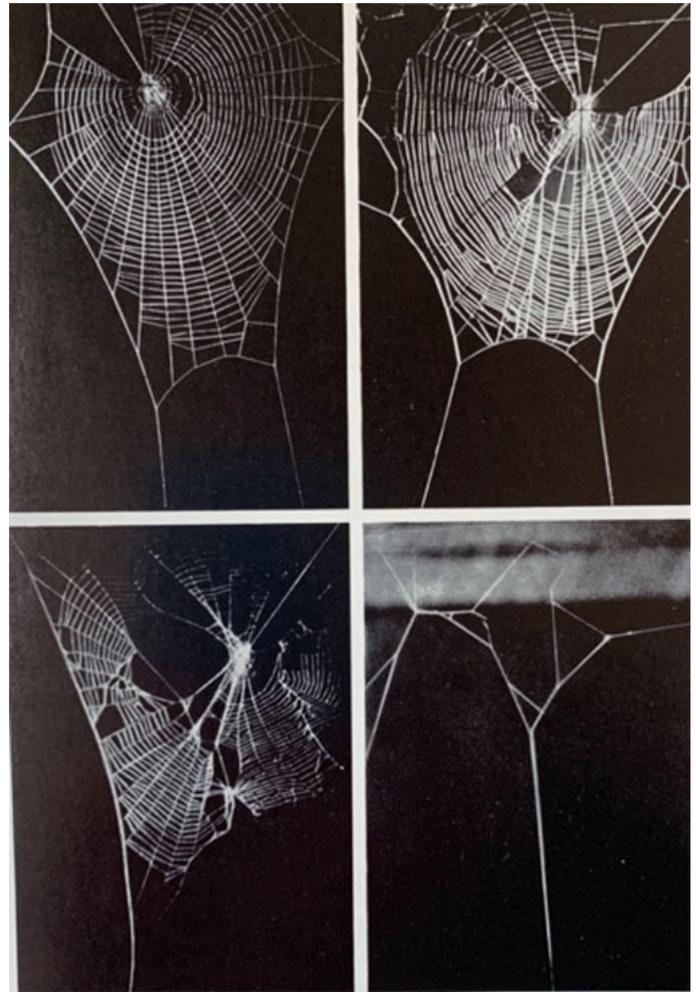
However, this is only part of the story. The organism reacts functionally to what it is evoked by. Bühler acknowledges the ingoing “Reiz” (stimulus, impetus) which functions as a cue for action, the outgoing “Werk” (act, work) part. The organism also realizes outputs, not only *after* receiving an input but also to adapt to its environment, and to adapt the environment *to* it. The outputs have a Gestalt quality as well. For example, Bühler writes about the flight of the beewolf (*Philanthus triangulum*) to catch a bee (see Figure 4), or of spider webs, the construction of which are shown to have Gestalt like features (Figure 5). The behaviour follows patterns that intend a result. The elements in the intended Gestalt can “transpose”, like the notes of a melody, to have the marginal effect leading to success. They are not mechanically associated sequences of pre-programmed steps. The patterns include variations in the environment and changes in behaviour (Bühler, 1960a:36; 1969a:152).

Figure 4. The flight of the beewolf (*Philanthus triangulum*) to catch a bee



Bühler emphasized that there are many Gestalts in the *acts* of humans and animals. Playing guitar or piano is an act full of learned and well-timed sequences of manual operations that for the player and the listener have the characteristics of *Gestalts*. We play chords, not minimal movements of muscle in fingers. The scratching of a dog is a Gestalt act; amputate a leg and the dog will use one of its other legs. Bühler cites C.D. Darlington: “Forms ... *actually* arise before they have a use; they *always* survive beyond their use.” (Bühler, 1960a, p.

Figure 5. A spider's web rebuilt four times after injections of a catatonic poison



81)²¹. Bühler here points at the threefold ways of appearance of the Gestalt principle: as Gestalt principle of growth, as gestalt principle of creating, and as gestalt principle of communication (Bühler, 1960a, p. 35).

In the manuscripts Bühler left behind, a 100 page unfinished manuscript was found about “The clocks of living beings; studies for a theory of space-timely orientation” (Bühler, 1969a). It discusses observational and experimental studies, again on the three aspects of animal acts: symptom, signal, and symbol. For instance, bees that return from a rich source of pollen and nectar, perform a “dance” that signals (appeals) to other bees to go there too, and symbolizes in the “dance Gestalt” the direction, distance, and scent of the source. Another subject in the manuscript he left behind was about

²¹ But more important were his theoretical insights. From Albert Wellek Bühler borrowed a citation that referred to his discussion of association psychology in his own *Die Krise der Psychologie* (Bühler, 1927). The four “axioms” of association psychology (subjectivism, atomism, sensualism, mechanism) to which Wellek had added the objectivist and the constancy axioms. Gestalt theory criticizes all of these, and indeed Bühler contributed already very early to an alternative view of Gestalt psychology (Bühler, 1913).

orientation and navigation in migratory birds. Unfortunately, the work was not finished. Bühler intended to discuss the Gestalt of time scales. He died before he had the time.

Gestaltprinzip

Interestingly, one of the lesser-known members of the Berlin group was Adhémér Gelb, who worked together with Kurt Goldstein since 1915. Goldstein and Gelb wrote many articles together, mainly reporting about their work with wounded soldiers in the Frankfurter Lazarett. Goldstein expressed his joy in working with him because of his thorough insights in Gestalt psychology. Later Gelb held a chair in psychology at the Frankfurter *Psychologischen Institut*, together with Max Wertheimer. Theodor W. Adorno and Max Horkheimer met for the first time in a seminar given by Gelb. After the NAZI's started the persecution of Jews, he had to emigrate to the Netherlands, where he awaited a visa to the USA, like Goldstein. However, he died in 1936 because of tuberculosis of the lungs.

Gelb's theoretical and experimental work is mostly about the loss of perception of space, of colour, about aphasia and agnosia, about language and cognition due to brain injuries (Bergius, 1964). Together with Goldstein he developed the ideas about the distinction between concrete actions and abstract or categorical thought. An important discovery that strongly inspired his Gestalt theoretical ideas, was about agnosia. Not the loss of imagery and of knowledge of things at the cognitive level causes the so-called "*Seelenblindheit*", mental blindness, being unable to recognize figures or words. However, Gelb and Goldstein argued that it's cause is the disturbed perception of Gestalts already at the level of perception. This reflects their position that perceiving is a matter of perceiving the whole at the same time as, if not before, seeing the details. In his Ph.D. thesis Gelb already discussed implications of Gestalt theory (Gelb, 1910), but he still wrote about Gestalt in concordance with the view of Carl Stumpf, the supervisor of his thesis. He still adhered to the view that Gestalts were merely postulations and had to be seen as a summation of more atomistic and immediate sensory elements. Stumpf preferred to use the term "form" by which he meant "correlate of a summarizing function". This was implied by the idea that, like the sensory elements, the relations between them were part of conscious contents, therefore Gestalts needed not to be new contents. Gelb later changed his view to regard them as the immediate sensation of forms, to be interpreted as wholes, and, together with Goldstein, as an organismic view. Gelb and Goldstein's theory can be seen as an elaboration in the research program.

Gestalt qualities exist: the hard core

So yes, Karl Bühler was a Gestalt *theorist*. The Berliner Gestalt *psychologists* already formulated some Gestalt principles (Koffka, 1935):

- the principle of the *primacy of the Gestalt*: the whole rules the elements,
- the principle of *transponibility*: things perceived as one Gestalt can be given the same form by different elements,

- the principle of the *environmental field* (Koffka, 1935, p. 106) "the looks of things are determined by the field organization to which the proximal stimulus distribution gives rise." (p. 106): there is an interaction between the stimulus elements, the field or background in which they appear, and the person perceiving them,

These principles resulted in the many Gestalt "laws"; for example, laws relating to²²:

- the *figure-ground* relation,
- the *constancies* of, colour, distance, brightness, volume, melody etc.,
- *good continuation, closure, contiguity, good shape,*
- *3D space and motion.*

The Gestalt axioms Bühler suggested were more elaborate, especially deeper. Following Theodor Hermann (Bühler, 1960a; Hermann, 1957) his axioms are:

1. *Immediacy*: we recognize a Gestalt immediately (Bühler's *Aha-Erlebnis*),
2. *Supersummarisability*: "The whole dominates the detail",
3. *Functional primacy* and being "ready-grown" (inborn, instinctive),²³
4. *Unitas multiplex*: unity of Gestalts in diversity of details,
5. *Meaningfulness* for the receiving or acting organism, to which Bühler added
6. *Transponibility* of Gestalts and of thoughts.

Bühler implicitly developed Gestalt theory by recognizing the functionalism that it needed to obtain insight in such complicated psychological processes as thought, language production and reception, the perception and comparison of proportions in/

²² Koffka and Köhler also suggested the principle of psychophysical parallelism or *isomorphism*, stating that the organization of the internal physiological field in the brain reflects, or even resembles, the parallel organization of the external environmental field. I leave this principle for what it was because it was soon found out to be untenable, but I like to point out that Bühler critically discussed this version of the psychophysical parallelism already in 1913.

²³ By the functionality and purposefulness for humans and animals he implied that any organism lives in an environment of *Gestalts that are functional for its own survival, and that facilitate its actions*, without perceiving the world as it is according to – say – the theories of physicists, or the atomist view. Organisms live in a world of perceptual cues and "actable" handles and objects, things the organism can meaningfully act upon. Humans live in a complex world, not of elementary particles and bosons, or whatever, but of cars and cabins, of buildings and bombs, trees and treasures, words, and sentences. The latter is reflected in his work on language (*Sprachtheorie*) which truly is a work of Gestalt theory. Bees live in a world of colourful and "smellful" plants; a tick lives in a world of the smell of sweat, the sense of hairs and the warmth of skin, which when perceived in that order results in the act of stitching and sucking blood. There is nothing else for it to do; it is its world. (The example is from Bühler, 1960a, p. 26). In my interpretation of Bühler's most recent version of the Gestalt principles the emphasis is on the presupposition that humans and animals tend to perceive and act upon the wholes of things and events that surround them and as far as they are important for their survival. They tend to act and react to the world at the zooming level they are attuned to, due to hereditary (inborn) and adapted (learned) systems of their species and their psychological and cultural makeup. No wonder that Bühler already in the nineteen fifties became interested in "cybernetics" and feedback systems. So one could claim he was one of the first evolutionary psychologists, although none of them referred to his work. His *Ausdruckstheorie* (Bühler, 1933/1968) is an early contribution to what later became named as "non-verbal communication" in ethology and evolutionary psychology. It also completed his early interest and rejection of teleological approaches: purposefulness without teleology is possible and depends on the Gestalt perceived as well as acted, using feedback.

of figures, and the ways of appearance of colours in contexts. Functionalism avoided the teleological approach that was popular in the nineteenth century. In his works on *Gestaltwahrnehmung*, colour perception, language, *Ausdruckstheorie* he focused on what he called *Kommunikationsgestaltungen* (Gestalts of communication). In his *Lebewesen* he focused on *Schaffungsgestaltungen* (creation of Gestalts/Gestalts of creation) in humans and animals. In his famous *Die geistige Entwicklung des Kindes* (1918a) not discussed here, he focused on *Wachstumsgestaltungen* (Gestalts of development). In all of them Gestalts are the hard or metaphysical core. Which brings me to the other characteristic of his research program, the heuristics.

Bühler's Heuristic: Tripods, Triads and Trinity

So the hard core of his research program is 'There exist Gestalts (or Gestalt qualities) for organisms such as humans and other animals'. But that was not all. In his career as a scholar, we see he developed a major heuristic in his approach in psychology: the heuristic of **trinity**. Predominantly Bühler tried to abstract to a distinction of three aspects, staying away from a polarizing division, pointing at the interplay between three aspects. His *Organon Model* (**Fout! Verwijzingsbron niet gevonden.**) focusses on the triad of expression, appeal and representation, his view of psychology at the three major aspects: *Erlebnis*, *sinnvolles Benehmen*, *objektiver Geist*. How did he arrive at the heuristic?

From Tripods to Trinity

It is not sure which introductory textbook Bühler used when he was in the Gymnasium of his youth. But surely mathematics fascinated him. It was his first choice after having decided not to study theology in order to become a priest (Pfarrer²⁴). However, when he arrived in university, he changed his plan again and studied medicine (Lebzeltner, 1969).

I mention his interest in mathematics because, being the best student of his class, it is most probable he learned triangles are the most stable mathematical constructions, and that three patted objects never have one leg off the ground but rest stable on the ground. It was a stable idea for the rest of his career in psychology, and which made him well known outside psychology. Increasingly Bühler came to consider psychology as one of the life sciences which also included biology, linguistics and other language related sciences, psychology of thinking and perception, social psychology, pragmatics, semiotics, etcetera. In brief the whole Gestalt of psychology. What interests me is how he arrived at the trinity of aspects of language and how it became the heuristic for many of his conceptual problems. I will discuss the role of his heuristics in his research program and its relation to the hard core. It is probably the most fruitful to do it like that because heuristics are involved

in all parts of a research program. What we can see as **his** research program develops together with the development of his heuristics. In the development of Bühler's thought he sometimes came to problems he never thought of in the years before. For instance, as he writes in his foreword to *Krise*, it was the request of his colleague Menzer to write an article for *Kantstudien* about the state of psychology. He started collecting facts, designing characteristics, bringing together ideas of others about psychology's present and future. And then he banged his head, "*bis ich nicht mehr ein und aus wusste*" (p. ix). Because of inner distress ("*aus innerer Not*"), he then put all the other authors aside and worked on the axioms of psychology to find out on his own where psychology stood and where it could go. Here he introduced the "doctrine" of the three aspects of psychology.

This was not the first time he came with *three* aspects. He had earlier already used the tripod many times, but most elaborate in his *Sprachtheorie* the development of which had started much earlier (e.g. 1918) than when he published the final version in 1934 (in his *Krise* of 1927 he already announced it on p. 29, "*Ein nahezu vollendetes Buch...*"). The application of the trinity heuristic in *Krise* was an example of stretching the idea he was working on in his *Sprachtheorie*, since, at least 1909 (Bühler, 1909/2012a, 1909/2012b)²⁵ It shows also how *transponibility* works.

So, the heuristic "if you want a clear and stable view use tripods" proved very useful. It not only suggested the three functions of a linguistic sign Z as a *symptom* or expression (*Ausdruck*) of the inner state of the sender, as a *signal* or appeal (*Appell*) to a recipient (*Empfänger*), and as a *symbol* for objects or states of affairs (*Gegenstände und Sachverhalte*). It also reflected the unity of the interpretations, as a Gestalt, and connected well with the hard core, the Gestalt axiom of the structured whole, united and separated, demonstrating *unitas multiplex* and *supersummarisability*.

He confronted again with Wilhelm Wundt. Wundt considered language as mainly based on the bundled expressions of conscious experiences: "*...die Sprache ist demnach nichts anderes als diejenige Gestaltung der Ausdrucksbewegungen, die der Entwicklungsstufe des menschlichen Bewusstseins adäquat ist.*"²⁶ (Wilhelm Wundt, *Die Sprache II*, geciteerd in Bühler, 1926c, p. 467).

Bühler, however, claimed not only that there were three functions a sign could have, but even that they were united in any language sign, at least in principle. The sign is a Gestalt (so *there are Gestalts!*). In human language (and in animals often as well), depending on recipients, a sign is both symptom, signal and symbol, although the latter not always dominantly. So, he tried to stick to the structured whole, to unite and to not separate, which was a continuation of earlier work on Gestalt perception, referring to an unobservable, the Gestalt quality of, in this case linguistic signs.

²⁵ In his extended review of Marty's *Untersuchungen*, Bühler (1909/2012a) already discussed the three functions later to be found in the *Organon* model of his *Sprachtheorie*. Many issues about the three functions were already discussed in his critical review of Marty's volumes.

²⁶ "Therefore, language is nothing but the composition of expressive movements that are adequate of the development stage of human conscious." (my translation, rvh)

²⁴ Obviously the roman-catholic religion refers to the Holy Trinity as well, including the unity of the three divine aspects of the one God. Probably this inspired Bühler as well.

Tripod and triad

In the earlier versions the heuristic was much less strong. In his thesis about Home (Bühler, 1905/2015) it still looks like a perspective. Remarkably, how all but one of the three (3!) chapters have three (3!) sections (and in one case even three subsections). Or when he characterized the three sources of meaningful behaviour of organisms (including humans and animals) as *instinct*, *dressage* and *intellect* (Bühler, 1918a, 1926b; 1927, pp. 21-22). In his work on thought processes he discussed three perspectives of thought: thought processes, thought relations and thought remembrances (*Über Gedanken, über Gedankenzusammenhänge, über Gedankenerinnerungen*). All three again divided in three subsections.

Comparing the earlier work with the later work shows how his heuristic developed and came alive. It developed from looking at problems from three perspectives to looking at three aspects of one Gestalt. So the Gestalt theory of Bühler, which already was part of the metaphysical core of his earlier research may have stimulated the growth of the trinity heuristic.

Conceptual improvement

When he introduced what was later to be called the Organon model (Bühler, 1909/2012a, 1909/2012b, 1918b) Bühler used the concepts *Auslösung*, *Kundgabe* and *Darstellung*. These words already reflected the dualism of his program, that is the duality of sender and receiver that are entailed if organisms live in a community. Communities need communication in order to steer to or away from something, so there must be at least one sender for every receiver, and one receiver for a sender to meaningfully send a sign.

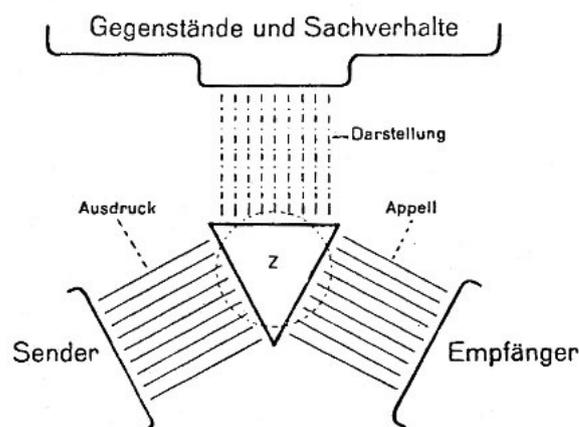
Later Bühler chose other words: respectively appeal (*Appell* in German), and Expression (*Ausdruck*) while he maintained description (*Darstellung*). Alternatively, he later introduced signal, symptom and symbol (Bühler, 1934b, p. 28). His reason (p. 29) was that the basic concepts of his model should be *semantic* concepts that related more clearly with the social function of language and the roles of sender and receiver²⁷. When a child has a pain, it will cry or say “au”, it does not give a message (*Kundgabe*), it is not a notification or announcement, it is a symptom. An adult appeals, he does not “activate” another person like an application.

The change reflected the need for a more general approach than the utterance idiom that the first approach seemed to show. *Kundgabe* (announcement) and *Auslösung* (activation) imply conscious and more or less formal intentions of the actors, while in his later model he explicitly refers to the possibility of unconscious and unintentional acts as well (*“wie immer sie motiviert sein mögen”*, p. 30). In the more general system of sender and receiver we can find the production of signs in any situation where steering, coordination, cooperation,

and expansion of the horizon of shared perceptions (*“Erweiterung des Horizontes der gemeinsamen Wahrnehmungen,”* 1934, p. 38).

As I mentioned already, his *Sprachtheorie* was published 7 years after Bühler published *Die Krise der Psychologie* (Bühler, 1927) on the state of psychology at the time²⁸. In it he criticizes Wundt's idea that all movements, including linguistic utterances, are “expressive movements”, *Ausdrucksbewegungen*. Bühler originally had called them “*Kundgaben*”, announcements, manifestations. What Wundt forgets, said Bühler, is that every *Kundgabe* implies a *Kundnahme*. The function of an expression is to inform, so a sender implies a recipient. Evolution led unintendedly to the system where the sender will predominantly send signals that are receptable to a receiver. At the same time, this led to a system where the receiver will only interpret expressions from the sender that are relevant. Sounds of dolphin's function to be heard and understood by other dolphins, not by pigs or cockroaches. That human beings are beginning to understand dolphins, is a side effect of another of the three aspects that Bühler distinguishes in the organon model of language.

Figure 6. The Organon model in Bühler's *Sprachtheorie*, 1934, p. 28



The organon model describes how a linguistic utterance Z (of “*Zeichen*”) may unite three functions: an expressive function (*Ausdruck*), an appeal function (*Appell*), and a representation function (*Darstellung*). They are irreducible to each other, let alone (as some of the *Wiener Kreis* members suggested) to the physical (material) properties of a sign. The first expresses something of the sender, for instance when you hit your finger with a hammer. The second appeals to a receiver, for instance to take over the hammer. The third function is to represent a state of the world, describe a fact.²⁹ Even a sentence

²⁷ Toccafondi discusses the relation between *Wiener Kreis*' Neurath and Carnap and the *Bühler Kreis* (Toccafondi, 2004). Notwithstanding their lack of respect, Bühler forcefully emphasised the *semantic* interpretation of language and its aspects, instead of the pure physicalism of his opponents interpretation of language. Only later Carnap and Neurath came to respect and partially accept Bühler's approach.

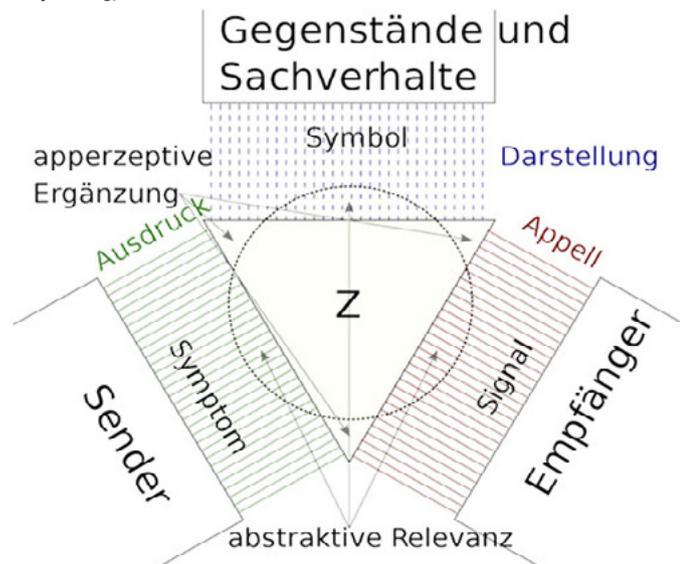
²⁸ For an overview of the discussion on crises in sciences at the time, and in relation to Kuhn's view on crises and revolutions in science, see Sturm and Müllberger's introduction to a special issue of *Studies in the History and Philosophy of Biological and Biomedical Sciences*. (2012).

²⁹ Popper took over these functions, only to add a fourth: the discussion or argumentative function. See also Sturm (2012) and Ter Hark (2004) on how Popper as a student of Bühler took part in discussing his *Krise*, on young Popper's thoughts about thought psychology and psychology's methods, and how Bühler and Selz

about hammers that has the shallow appearance of a description can bear expressive and appealing meanings. These are the functions that make social life possible and are intricately woven with it. They make “*Steuerung*” (steering, control) of and coordination with others possible. Steering in animals is mainly directed at behaviour of the other animal in its field, so a cry of danger is not only an expression of fear, it also is an appeal to other animals, a warning of danger. Human steering can be directed at actions, but also at conscious experience, thought, emotions, etc. In humans the third function of a sign, the *Darstellung* (or description, representation) supports social life on a cultural level, including science and technical products.

So, a sign has three functions, depending on both the sender, the receiver, and the represented object. The heuristic helped to specify how to deal with conceptual problems. A linguistic sign can change meaning depending on its context. We can explain this by looking at the picture, especially the inside part where he drew the sign (Z). The sign both has less and has more to tell than its literal meaning, the one you would find in the dictionary. *Abstractive relevance* and *apperceptive enhancement* (*Prinzip der abstraktiven Relevanz* and *apperceptive Ergänzung*) (Bühler, 1934b, p. 28), is what later Bruner called “beyond the information given” (Bruner, 1974). Here Bühler doubly used the trinity heuristic, a good example of how fruitful positive heuristics help to expand the concept.

Figure 7. Organon Model, after Bühler 1934, annotated and coloured (commons. wikipedia.org)



Design of Bühler's theory of language

On p. 50 of his *Krise* Bühler summarized the structure of his theory (“*Aufbau der Theorie*”) in a few axioms.

1. (a) Wherever there is a genuine, i.e. self-regulating, community life, there must be a mutual control of the meaningful behaviour of the community members.

(b) Where the points of direction of control are not to be found in the perceived common situation, a contact of a higher order must mediate them, by specific semantic institutions.

2. If the individuals involved in a communal act are to express their own needs and moods in the process of mutual control, they must make themselves known and be known.
3. By assigning their own expressions to the objects and circumstances, they acquire a new dimension of meaning, thus incalculably increasing their efficiency as a means of communication. The one through the other.

(Bühler, 1927, pp. p. 50, my translation; see also his earlier version in *Kantstudien*).

Bühler indicated in his text that 1(b) was the source (*Quellpunkt*) of semantics, in humans and animals. In his *Kantstudien*, referring to bees, he emphasized that

...there is a spatial transcendence of the directional point of control. For in the beehive, the newly covered flower species are not perceived, and yet the newly recruited ones are supposed to search the flight field for it; thus, ad hoc, in the signalling dance a purely semantic act takes place, transferring scent from the advertiser to the recruited. Perhaps one day we will succeed in systematically listing the possibilities of transcendence; the philosopher will immediately think not only of spatial transcendence but also of temporal transcendence and of what human language can do in this direction. It is almost more important to remember at the outset that we are attending to living individuals (Bühler, 1926c, p. 479).

And therefore, if we want to study language and its psychological foundations we would better begin with a phenomenology of language and its use, than start with the smallest elements we can detect. Its phenomenology will imply its phonology; phonetics will never imply its phenomenology.³⁰

So in the three mentioned axioms of the structure (*Aufbau*) of his theory of language we not only see the trinity heuristic but also an expansion that points to the role of language in community life. 1(a) clearly is what Watkins would have called an “all-and-some-statement” (For every x there is some y that ...) which is neither verifiable (the all part cannot be verified) nor falsifiable (the some-part cannot be falsified). 1(b) works this out by implying there must be some semantic instantiation that still makes signalling (*Kundgabe* and *Kundnahme*) possible, meaningful, and relevant when the facts or circumstances to be represented are not directly perceivable. It will refer to the ontology the bees share, which consists for the greater part of the location of the flowers, their smell, and as a source of nectar. This expansion now emphasises what has been implicit in much earlier work: that in psychology individualism makes it impossible to understand language and other functions. Psychology

³⁰ This refers to his disagreement with the positivist Wiener Kreis members Neurath and Carnap who professed a physicalist approach to language (Toccafondi, 2004). Moritz Schlick had a more moderate standpoint, as Popper pointed out in his dissertation in which he confronted Schlick's physicalism with Bühler's doctrine of three aspects (Popper, 1928/2006, especially §2)

inspired Popper's own ideas about Worlds I, II and III.

is a social science. What this implies for another heuristic I will discuss shortly.

Die Krise der Psychologie

The trinity heuristic also helped to unify the schools of psychology by highlighting that what allegedly opposing schools showed was the virtual, till then hardly observed, unity of psychology. Bühler unified what seemed, or claimed to be opposed, thus bringing together psychology as the science of inner experience, psychology as the science of meaningful behaviour implying the interdependence with others, and psychology as the science of what he called *objektiver Geist*. The latter indicated the approach of phenomenologists like Dilthey and Spranger who explained cultural products as products of the human mind made into objects to be experienced and criticised³¹.

So the trinity of the organon model repeats itself in what Bühler called "*die drei Aspekte Lehre*", the three aspects doctrine. It parallels the Organon model at a level higher, the level of psychology itself. In the nineteen twenties Bühler observed the collapse of discussion between psychology as the science of conscious life, psychology as the science of behaviour, and psychology as the science of human social and cultural products. After the false start on the invitation to write an article about the state and future of psychology, Bühler tried to find the axioms that could unite what then was divided in conflicting schools in psychology. Every one of these schools claimed to be the only true and justified way to do psychology. However, Bühler argued they represented three aspects of psychology: "*Erlebnisse*", "*sinvolles Benehmen*", and "*objektiver Geist*". Translated: conscious experience, meaningful behaviour, and (constructs of) objective mind. They echoed, respectively, the psychology of conscious experience (Wilhelm Wundt's focus), behaviourism, and phenomenology. Psychology's task is to explore and explain how experience relates to meaningful behaviour, how meaningful behaviour relates to objective mind³² and how the objective mind's products relate to experience.

All the aspects are about what is accessible. The first aspect is about what is accessible to consciousness for an individual. Although solipsistic at first sight, it is for psychology to explore and explain experiences by referring to subconscious processes, if necessary. The second aspect is about what is accessible for external observers. Behaviourists claimed this to be sufficient for the prediction of actions, often ignoring the meaningfulness of an action in a social context. The third aspect refers to the accessible (objective) constructions (*Gebilde*) of mind, like science, morality, art, culture. The third aspect is inspired by what phenomenologists consider the main task of psychology:

interpreting and explaining what a cultural, moral, artistic, scientific action or product evokes in a potential receiver about the maker's mental state when making the object.

So, though published later than the three aspects model, Bühler's organon model of language, can be seen as a logical implication of the three aspects doctrine (Bühler, 1927:45). Heuristically, for Bühler the three aspects doctrine was an elaboration of the organon model. The three aspects explain the fundamental basis in psychology of the organon model. The trinity heuristic worked it all out.

Bühler and the aim of (his) science

Heuristics also help to defend the hard core of theories against "attacks of the competition", in discussions with other authors. An important competitor was Wilhelm Wundt, as already indicated. Before discussing their confrontation further we need to look at the way scholars interpret the aims of science, as discussed by Watkins (1984, p. 130 and subsequent discussion).

In Watkins' analysis science should not have poles that attract in conflicting directions. One is the *truth pole* that says science should deliver absolute truth, be it in theories, hypotheses, facts, statements, predictions, observations, etc. This is aim A.

On the other hand there is aim B, the *depth pole*. The aim is to get

- B1: ever deeper theories,
- B2: increasingly unified theories,
- B3: ever more predictively powerful theories,
- B4 increasingly exact theories.

In the first half of the 20th century (Bühler's time), there was much debate about these poles. The truth pole attracted the philosophers of science: the *Wiener Kreis* or *Ernst Mach Verein*, Mach, Neurath, Carnap, Bridgman, Durham, Schlick, Wittgenstein I, Russell, Ramsey), and to a lesser, probability oriented, extent the statisticians psychologists got used to: Fisher, Pearson, Neyman, Kolmogorov, Woodworth, etc., with the exception of R.D. Luce³³. They were all obsessed with truth and justification. This pole even attracted Husserl, although he went to the very bottom of possible truth, only found at the level of perceptual reports of a first-person, here-and-now-type (Watkins, 1984, pp. p. 79 and 153-154 about Husserl's Cartesian Meditations, Husserl 1931).

Most natural scientists, however, especially in physics, were attracted to pole B, the depth pole. Einstein, Planck, Rutherford, Bohr, Heisenberg, Schrödinger preferred to know more the faster way, using speculation, accepting that *absolute* truth was not workable. Of course they didn't reject truth, but not at the cost of depth. Depth first, criticism to approach truth later.

Most psychologists came to follow the philosophers. Wundt, Skinner, Watson, Eysenck, Woodworth, Boring, Carell, Cronbach, Guilford, Hebb, Hilgard, Osgood, Kahneman, Tversky were or are first and foremost truth seekers. The APA seems attracted to this pole as well, considering the various versions of their publication manual and "Journal Article Reporting Standards for Quantitative Research in Psychology" (Apfelbaum et al., 2018).

³¹ Popper focused on criticism as the fourth function of language, related to his World 3, Popper's objective knowledge which strongly resembles Bühler's *objektiver Geist*. In his elaborate discussion in *Krise*, Bühler focused on how *objektiver Geist* connected to meaningful behavior and experience.

³² Objective is to be understood more or less in the same way as Brentano's intentionality, as a (human made) object that intends to stand for a mental content, of an object that represents and evokes mental activity of a real object or event that is not present. Note that contrary to modern use, Bühler, like Stumpf, used "objective" in the proper sense of "directed at objects", which could be cues to unobservable mental objects (UMO's).

³³ Compare Gigerenzer (2001) discussing Brunswik's struggles.

Only some psychologists were more attracted to the depth pole, psychologists like Stumpf, Külpe, Ach, Gestalt psychologists like Köhler, Wertheim, Ehrenfels, Koffka, Bartlett, James, Freud, R.D. Luce, Tolman, Brunswik, and of course Bühler. Currently, almost all academic psychologists care more about the weight of the grains of truth than about the four legs of depth.

Wundt vs Bühler

After his dissertation on Henry Home (1905/2015) Bühler started investigating thought processes as a member of Külpe's *Würzburger Schule*. It was in this context that the first of three published articles (Bühler, 1907, 1908b, 1908c) led to the discussion with Wundt (Bühler, 1908a; Wundt, 1907, 1908). Wundt criticized the methods used in Würzburg, essentially, Bühler said, because they did not use his method. He claimed it was impossible for experimental subjects (*Versuchspersonen*) to answer the question the experimenter put to them, and to observe their inner process when they were busy solving the experimenter's question. The Würzburgers did not use, or only used superficially, the instruments ("*psychischen Massmethoden*") necessary to measure the processes involved without claiming their simultaneous awareness of them. Wundt even suggested that the experiments in Würzburg had been influenced by the planless and blind testing ("*planlosen Herumprobieren*") of the then popular hypnotic experiments. Therefore, according to Wundt, the Würzburgers only produced "*Scheinexperimente*" (sham experiments), and "self-observations with obstacles" (p. 358). He emphasised the strict scientific concept of experimentation ("*Vollkommene psychologische Experimente*") (Wundt, 1907, p. 312), like they were *en vogue* in physics (that is the philosophers' reconstruction of them), except for the extra complication that psychologists had to do with human beings, instead of inanimate objective reality. The experimental participant should be confronted—as usual according to Wundt—with a stimulus (*Reiz*) that evoked a response (*Ausdruck*). The reactions included physical symptoms such as heart-, breathing- and vascular innervation, that depended on the strength and quality of the stimulus, and therefore had to be measured with known physical methods. This is the psychophysical parallel axiom.

The participant in a Würzburger experiment had to give an answer depending on the meaning of the question. So Bühler replicated that Wundt's method could not solve the problems the Würzburgers wanted to solve. In the Würzburger experiments the experimental subjects were not asked to observe their mental processing and reproduce the answer to the question the experimenter had put. The experiments were not about testing the response to stimuli, but about the role of thinking and the sequence of thoughts in meaningfully answering to a meaningful question. Here we see how Wundt claimed to know better than the actual participants what was their experience of the experiment. Wundt did not understand that the questions were inspired by the *three aspects doctrine*, that the problem that the question was about had to be interpreted as a sign. Although Bühler had not yet formulated his organon model, implicitly it could already be discerned in the experimental design. In terms of the three aspects he tried to investigate how items (descriptions, representations)

from the *objektiver Geist* aspect were related to inner experience (*Erfahrung*).

The discussion is too elaborate to repeat here all the points Wundt or Bühler made. But the debate shows an important aspect of the way Bühler progressed his work. There were three interdependent ways of progress that Bühler brilliantly used. One was his Gestalt theoretical approach (beware, NOT his Gestalt psychological approach) to problem solving. Two, his trinity heuristic, and third his focus on solving empirical *and* conceptual problems.

Earlier I discussed Bühler's Gestalt theoretical approach and the trinity heuristic. I now look at his problem orientation, and the difference with Wundt. Already in his discussion with Wundt he clarified that truth may be important but more important is solving unsolved conceptual problems. Whereas in the late 1890s and early 1900s, thanks to Wundt, psychology was mainly focusing on how a person obtained conscious thoughts about external reality (by collecting the elements elementary thoughts supposedly were made of, and therefore made from), Külpe, Bühler, and the other Würzburgers were interested in how complex thought processes occurred. Wundt started with elementary sensations and almost inevitably concluded that thoughts had to be image-like because images are made of sensations. Bühler et al., on the other hand, started with thoughts obtained from objectified products of mind, and concluded that a) images were not necessarily involved in thinking, and b) that being able to analyse a thought into elements doesn't imply that elements are the blocks that build thoughts, because, 3) thoughts are primarily Gestalt-like, and secondarily analysable. Ergo: For Bühler depth came first, for Wundt truth.

Massen and Bredenkamp were not right in claiming Wundt was right in his discussion with Bühler

A few years ago Massen & Bredenkamp (2005) looked again at the discussion between Wundt and Bühler. They argue Wundt was right in his discussion with Bühler and the Würzburger Schule. They base their claim on how Wundt's method of investigating processes of consciousness, more than the method used by the Würzburgers, resembles the modern method of protocol analysis and analysis of self-reports in cognitive psychology.

Their claim reflects the obsessive-compulsive behaviour of psychologists concerning methods. Research psychologists seem to be concerned with using the right, philosophy and APA approved methods for finding the one and only way to truth. It is the intellectually transmitted disease that science is only about guaranteed truthful facts.

As Bühler already accepted, and as, for example, Laudan (1977) emphasized, science is about solving empirical *and* conceptual problems. Both types of problems are considered important and urgent in their own time. This is what the controversy between Wundt and Bühler really was about. The issue was not the method used, as Wundt claimed, but the problem situation that Bühler primarily focussed at. Bühler knew very well that if you want to investigate complex thought processes, you should not primarily care about Wundt's or any other existing method. What became

clear is not only that complex thoughts do not necessarily involve images but also that many answers to what the experimenter asked the subject to think about were already clear even before the subjects knew how they ever got there. The Gestalt of the thought came first, before the elements surfaced of which the solution was built.

Massen & Bredenkamp argue “dass es empirische Hinweise auf unbewusste Gedankenaktivität, z.B. in Form von hochgradig automatisierten Denkprozeduren und Heuristiken gibt, über die prinzipiell gar nicht berichtet werden kann.” (p. 113³⁴). Even if this might contradict Bühler, it also contradicts Wundt. Nevertheless, they ignore what is the most important in the discussion between Wundt and Bühler: it was not the case that Wundt’s theory incorrectly predicted how his experimental subjects would *react* to *stimuli* like the ones the Würzburgers asked. It simply was the case that Wundt gave no prediction at all because what mattered were their responses to questions about information. He should have given his interpretation of what happened in the Würzburger experiments in view of his claim he explained conscious thought; he should have undertaken the experiments on this level of thought himself. It was Bühler who convincingly argued that Wundt’s theory was anomalous, whether Wundt considered it or not.

But again, one could question if unconscious thoughts were an anomaly for Bühler’s theory. Massen and Bredenkamp refer to research in cognitive psychology, especially on conscious processes, attention, and cognition. Interestingly, cognitive psychology ignored the role of language in thought, or exported, un-returnable, language research to linguistics. Although not at all in the tradition of Bühler’s functionalism, almost all psychologists have excommunicated Chomsky out of the cognitive psychological church. And not only Chomsky but also the function-oriented linguists, like George Lakoff’s generative semantics.

While Bühler was investigating complex thought processes, he inevitably confronted other complex processes. It therefore does not surprise that, in the same period, he went to Gestalt perception and to language as well. In his *Gestaltwahrnehmungen* (Bühler, 1913) while already in 1911 he published an article about investigating thoughts about spatial relations (Bühler, 1910). So here we see the connection between thinking and perceiving spatial relations. And already in 1908, in 1918, 1920, 1923 well before he published his overarching *Sprachtheorie* of 1934, he investigated and published about language. But his theory differed from Wundt’s *Völkerpsychologie*. Wundt saw language as the way humans express thoughts. Bühler asked himself, why *überhaupt* we would *express* our thoughts? Why not solely having our thoughts to ourselves?

This was not primarily an empirical problem. This was a conceptual problem that evoked a new empirical problem. How are language processes related to thought processes? If thought can be imageless what else does it comprise? How are thought processes related to language? How are words and sentences related to thought contents? Why have linguistic (and quasi-linguistic) signs such an overwhelmingly important role in human life and thought?

³⁴ ... that there is empirical evidence of unconscious thought activity, e.g. in the form of highly automated thought procedures and heuristics, which in principle cannot be reported at all.

Wundt’s Parallelenaxiom and Bühler’s Zweiersystem und Steuerungsaxiom

Bühler summarises Wundt’s theory of language as comprising three axioms:

1. The parallel (or psychophysical) axiom: for all emotions there are some parallel body movements and vice versa.
2. From the lowest animals to humans, the evolution of emotions can be visually perceived in the expressive movements (*Ausdrucksbewegungen*) of another organism. So what you see is what they experience.
3. According to Wundt, expressive movements of organisms have acquired a relative autonomous status into expression words (*Ausrufungssätze*) in spoken language (*Lautsprache*), having developed together with sign language (*Gebärdensprache*). So descriptions are declarative sentences (*Aussagesätze*) that have their origins in experiences (in Wundt’s words “*Ausrufungssätze*”).

Bühler’s criticism is that what you can experience yourself you can see in the expression of the other organism. Because almost all organisms are social to some degrees, we must add the appeal function to the expressive function (earlier *Kundgabe*, later *Ausdruck*). For human language we have to add the descriptive or representation function of signs, precisely because we describe or represent not only for private reasons, we need adequate representations to refer to the external environment for other human beings as well as for ourselves. The appeal function is as much as the description function a major part of the principle of steering and influencing, an aspect that Wundt misses.³⁵

In this way Bühler (1927, p. 50) contrasts Wundt’s axioms with his own axioms. He opposed Wundt with what could be called *Bühler’s Parallel Axiom*: the mirroring of *Kundgabe* and *Kundnahme*. When there is a community, a sign presupposes a sender and a parallel receiver. Whereas Wundt considered language as a relatively independent sector³⁶ that emerged mainly, if not only, from the expression of subjective states of *individuals*, Bühler emphasised that the source of semantics is that almost all animals, including humans, live in a *community* where steering of each other’s behaviour is essential. In Wundt’s theory the function of linguistic utterances is to express. Bühler’s theory added the function of appeal to other organisms (persons) (the signal or appeal function), and the function of representation of facts, states, and events, through symbols. Bühler’s main objection is that Wundt does not deal with language on the receiver’s side.

This made Bühler’s theory deeper, richer in content. Although Bühler seemed to introduce existential statements to unobservables that cannot be tested, they formed part of the metaphysical core as implications of a theory and its hypotheses that *were* testable. His trinity heuristic suggested that this would be an excellent strategy. It

³⁵ . Bühler’s suggestion got supported many years later by the discovery of so-called mirror neurons (Kohler et al., 2002; Rizzolatti & Craighero, 2004; Rizzolatti & Sinigaglia, 2010)

³⁶ : “...die...Annahme, dass aus dem Ganzen der Ausdrucksbewegungen die Lautsprache als ein relativ selbständiger Sektor hervorgeht.” (Bühler, 1927, p. 31)

would imply more stability in his functionalist approach of language, and it would imply that meaning had an inalienable role in language. Precisely because he was after a functionalist theory of language, a theory that should explain what language is for, the functions of a sign were a major contribution to linguistics, and psychology as well.

The organon model expresses – or maybe we would better say *symbolizes* – another side of his metaphysical core, that implicitly emphasizes the relation to psychology: language is a tool of the mind, is a virtual organ like the heart or lungs or brains. In his own words: “*Ich bin nicht als gezogen um die Psychologie zu reformieren, sondern um die Axiome der Sprachtheorie zu finden.*” (Bühler, 1927, p. 29)

Since we connected (or reconnected) his theory of language to psychology it becomes clear how the trinity heuristic has been used to give the three language functions their foundations in the three aspects of psychology. He gave three areas of research orientations in psychology in the first part of the twentieth century their unexclusive place: behaviourism, phenomenology, and the psychology of subjective experience. In Bühler's terms the psychology of *Benehmen, Erlebnis und (objektiver) Geist*.

The Other Heuristic in Bühler's Work: Psychology is a Life Science

The controversy with Wundt mainly has been interpreted as a conflict over methods, as about the truth pole. But this was not the only conflict between Wundt and Bühler. I defend the claim that the conceptual conflicts over depth and unity were more important and the source of the methodological discussion they had. An important point of discussion was about imageless thoughts. Wundt understood Bühler to have claimed that thoughts necessarily were imageless, which, according to Wundt, was totally unrelated to what was known from (his) psychological research. Bühler, however, disagreed. He had not claimed that thoughts are imageless, he only had found that some of his participants reported that sometimes thoughts were imageless. Note that although this seems to be an empirical problem it is a conceptual problem at a deeper level. Bühler's response to Wundt made clear he had designed his experiments in a way that he could observe the relation of images to thoughts. In fact, the “hypothesis” of Wundt was that for every thought there is some image, which is neither verifiable nor falsifiable and that Wundt considered being a dogma: for every thought there *must* be an image that is the thought's foundation. Bühler's research question solely was, what was at the front of the conscious experience when the participant was finding the answer to his experimental question. And some reported that there was no image that came forward in their conscious experience. This occurred even when he (as he later published in 1908c) found that participants not always could find the right words to report a clear thought they had. If all thoughts were based on images, this could not have happened, because participants could have described what they “saw”. Therefore, Bühler concluded thoughts were independent from images.

The Cartesian versus the Aristotelian

That the depth pole was more important to Bühler than Wundt realised, became only clearer after Wundt had died and Bühler had developed his program for psychology further. As Gerold Ungeheuer (1984) suggested, Wundt's and Bühler's theories differed in their fundamental presuppositions. Wundt's core idea was Cartesian, what sometimes we know as a parallelist, or dual aspect doctrine. Body and soul were to be considered as two perspectives – ways of seeing – of the same object, *in casu* humans, a physiological or psychological perspective. Wundt's psychology was, like Descartes', individualistic. It restricted him in his view of the role of language, and in his method. Wundt considered language as basically evolved from the expression of an individual's conscious states that resulted from the association of elementary sensations. This made him a critical idealist (Ungeheuer, 1984, p. 21).

Bühler was a modern Aristotelian, according to Ungeheuer. An important presupposition of his program was that organisms live in a community (*Gemeinschaft*) and depend on regulating systems, systems that result in stable inner states, and, through steering others, in stable social relations, and in viable relations to the outer world. In humans this reflects not only the expression (symptoms) of the inner state but also the steering of other organisms (signal function) and the description and representation of the outer world (symbols). The living organism is a Gestalt that lives thanks to the three aspects of signs (or at least and not less than two as far as animal organisms are concerned).

It explains numerous things of Bühler's work, for instance, his lifelong interest in the way animals interact with each other and their world, or his early interest in cybernetics, or the double interpretation of signs as energetic and cybernetic, the role of stimuli as physical impulses for behaviour and as cues for knowledge-based actions, and his emphasis of *meaningful* behaviour, his interest in development, and finally his new program for psychology as presented in his *Krise*.

Although Ungeheuer was right in his observation of the conflict between a Cartesian and an Aristotelian, what he presented as one presupposition for all of Bühler's work does not reflect the way Bühler step by step developed his view, and how he subsequently arrived at what would better be called a heuristic. From Ungeheuer's approach it seems as if Bühler had been born with a complete Aristotelian world view, while it must have taken some time to realize again and again how to proceed from one result to the next. In his dissertation on Home there were some seeds in his discussion of teleology, which has an Aristotelian flavour. But, for instance, how to get from *Studien über Henry Home* (Bühler, 1905/2015) to *Tatsachen und Probleme zu einer Psychologie der Denkvorgänge* (Bühler, 1907)? Or how to get from the theory of language (already in a nutshell present in 1909, even when completely published in 1934)(Bühler, 1909/2012b, 1918b, 1934b) to his views of the unity psychology (Bühler, 1927)?

He may have realised the Aristotelian view of his theory of language and the three aspects doctrine of psychology only later. In his *Krise* Aristotle is the most cited author but two.³⁷ Already on page

³⁷ Only Spranger (17) and Wundt (11) score more than Aristotle (10); these are the numbers from the name index, where a reference to a single page and to more

2 he confesses his views go back to Aristotle "... to Aristotle to whom we, today, when the basic thoughts of this book [*Krise*] are right, again come closer to in many points" (Bühler, 1927, p. 2). He reminds the reader of the first scientific psychology of Aristotle, that it was thoroughly biologically oriented, and that he advocated a theory of automatic and active conduct. It was Aristotle who pointed out that not all language can be subsumed under the logical rules of truth and falsehood (who he mentioned in one breath with his argument against the positivist theory of language of the Wiener Kreis). He pointed especially at the intentionality that Brentano reintroduced "after it was underlying unrecognised or veiled since Aristotle" (Bühler, 1927, p. 67), which he connects to both his interpretation of objective (to which I pointed earlier) and the steering function of signals (or appeals) in community life. And of course, how the Gestalt and *Ganzheits* ideas in biology are related to Aristotle's discussion of Forms. The "aristotle-ism" made Bühler decide that psychology is a life science, biology oriented, but autonomous as a first science. That is a science that analyses and defines what sometimes can be further explained and specified in what for psychology are "secondary sciences" (like phonetics, or physiology). Calling it a life science implies that it determines what the program of psychological research was to be about, what to count as problems to solve and how to find solutions in the integrated and integrating approach to meaningful behaviour, conscious experience, and objective products of mind and, consequently, *steering* as an important aspect of living in communities. That the study of language is central in that program is obvious and cannot be (but often is) underestimated.

The Aristotelian aspect is echoed in the biological orientation he had already early in his career. In his theory of language, developed in over twenty years, the argument for the triple role of signs is supported with the argument that humans use language for their survival, survival in a broad sense, both as an individual and as a member of a community. As has Ter Hark (ter Hark, 2004) indicated, Bühler and Selz, were colleagues in investigating thinking. They were convinced that psychology needed to accept that humans were social animals by nature, gifted perhaps with more intellectual capacities than the other species. This also had to imply that there had to be developed a biology of the inner processes of the organism, a biology of the mental and the cultural products of mind. Where Selz continued his work to develop a theory of (productive) thinking, Bühler focused mainly on language. Although both careers were broken because of the *Anschluss* and what followed (Selz eventually was murdered in Auschwitz), and although their theories and research program promises were mostly ignored, they already had an evolutionary epistemology-cum-psychology³⁸ in mind. Only later it became clear that Karl Popper's philosophy was inspired by Bühler's and Selz' ideas.

Darstellung

After this digression it is safe to say that the Wundt-Bühler controversy was more than a methodological issue. It also clarifies that another of the criticisms of Bühler's theory failed. Effers-Van Ketel (2005) discusses a review of Bühler's *Sprachtheorie* by A.W. De Groot who suggested that the symbol function of signs eventually was inconsistent in that it either had a role as a reality description (naming) while other signs function as a pointer (*Zeigwort*, versus *Nennfunktion*). Therefore, the appeal and representation functions were indiscriminate. However, in the Aristotelian and cybernetic tradition this distinction plays a different role (if at all). For pointing implies (and in children is suspected to be) reaching out to the object wanted. Pointing is grasping, only incomplete, and it functions as a cue, if not an appeal (get me the apple). Pointing to an object can go together with naming the object. So *Zeigwörter* are words that refer to other things, to you or me, this or that, here and there, but they only specify the thing or name word they are connected to in the social, signalling relation between sender and receiver, and the symbolic relation of representation. So they should not be seen as two or three distinct words (the Cartesian-Wundtian approach, so to speak) but as one sign (e.g. 'this book', or 'that hat over there'), having both a pointing value and a descriptive or representative value. Bühler already discussed this in his review of Marty's volumes on the foundations of general grammar (Bühler, 1909/2012a). The confusion may have been based on the use of the word *Darstellung*, that in German implies a multitude of meanings.³⁹ There are languages that synthesise values in one word, other languages use more than one word for more or less the same thing to be represented. In non-verbal utterances accompanying spoken words this may be obvious. In Bühler's threesome of signs he even has a suitable solution for this problem, a negative heuristic. The drawing illustrated this used. The circle represents the sign, the triangle cuts off part of the circle (*abstraktiven Relevanz*), and enlarges the circle partially (apperception enhancement, *apperzeptive Ergänzung*) (*Sprachtheorie*, p. 28). This results in a selection of meaning that is because of the context, either the context of the situation where sender and recipient are present, or of the written context where the recipient and sender not are in a face-to-face relation, and even the represented items are invisible or absent⁴⁰. Ultimately, the *Darstellung* is a "*Vertretung in einem Erkenntniszusammenhang*", a representation (or substitute) in a knowledge context (Bühler, 1923, p. 287).

The terms abstractive relevance and apperceptive enhancement (*Prinzip der abstraktiven Relevanz* and *apperzeptive Ergänzung*) (Bühler, 1934b, p. 28) show that a sign often is interpreted "beyond the information given" and selects the intended interpretation, using

than one subsequent page (e.g., 34ff) are counted as one. In *Sprachtheorie* Aristotle scores the fifth position, after Brugmann, Bühler, Wundt and Husserl.

³⁸ By this I mean to indicate that both Bühler and Selz were convinced that no psychology of the so-called higher functions (thought, language, problem-solving) was possible without acknowledging the (non-positivistic) theory of knowledge. They didn't adhere to psychologicism in logic and philosophy, nor to logicism in psychology. But they did profess that thought in the psychological sense had to be related to thought in the philosophical sense and the one of science.

³⁹ My German-English dictionary mentions to represent, constitute, present, display, pose, show, depict, portray; synonyms in German include (translated into English) to mean, *bedeuten*, which etymologically relates to pointing, as the Dutch words *duiden*, *aanduiden* and *beduiden* imply. But as Bühler suggested (already in 1923) a sign used as a representation is more than that: it can, and often does, also reflect an opinion of the author or an appeal to a recipient. And words of an actor acting Faust perhaps even more so than words of a messenger, or photographs or fever curves (Bühler's examples).

⁴⁰ The fever curve doesn't show the fever itself.

the context. This context involves not only the linguistic context but also the situation of the organism producing the sign. This is where the organon model of language relates to the three aspects doctrine of psychology.

Bühler clarified we need to consider language as the S-F-System of word and sentence: a word gets its intended meaning in the Sentence's Field: a sentence gets its meaning due to the possible word meanings it selects.

I would add to this the distinction between "synthetic" and "analytic" idioms. For instance, Spanish and other Romance languages concentrate meaning as much as possible in verbs and - to a lesser extend- in the noun. Therefore, Spanish has numerous conjugations (preterito perfecto, imperfecto, indefinido, conditional, futuro, preterito perfecto de subjuntivo, preterito imperfecto de subjunctive, preterito pluscuamperfecto de subjuntivo, and more etcéteras; there must be some 25 of them. Also the personal pronoun often can be omitted because the pronoun is already contained in the conjugated verb). All the variations are contained in one verb, with only in a few cases with the aid of one auxiliary verb. Analytical idioms, on the other hand, express the same meanings but use fewer conjugations of *more* verbs. For instance, preterito pluscuamperfecto de subjuntivo in Spanish is "me hubieras llamado", which in English is: "you should have called her", or in Dutch "je zou me hebben moeten bellen".

Figure 8. Lolly, lollypop, piruleta, sucette, Zuckersaugbonbon mit Handangriff.



English is even more "analytical" in words like "cry of fear", which in Dutch would be "angstschreeuw" and in Spanish grito de miedo. So a sign not necessarily is one word, it can be a paraphrase. In Spanish a lolly is called a *piruleta*, in German it is called a *Zuckersaugbonbon mit Handangriff*.⁴¹

This is a conceptual problem the answer to which Bühler did not give, because of the break in his career and his emigration to USA. Moreover, De Groot wrote his criticism in Dutch, a language Bühler did not master. But I think the program permits this defence because the heuristics of it help to clarify how he could have answered. Of course other theorists like Jakobson, Popper, Habermas, went even further and abandoned the triada linguistica (Luelsdorff, 1984). But I cannot go into this here.

Conclusion

I have tried to "rationally reconstruct" the heuristics and the hard core of Bühler's research program and some of the rivalling theories that have made it into a program during his working life. There were more, and stronger "forces" than empirical results and methodological norms. His experiments were inspirations for new developments, surely, but not without problems. His methods were interesting: we must describe them as experiments although more recent restrictions to the use of this term have been introduced from the truth pole. There also was discussion about their methodological value, let alone of what through later strapping has become to be considered as a "proper" experiment. Bühler realized this but sometimes strategically and rationally neglected the empirical and methodological problems. As I discussed, Watkins (1984) suggested there are two opposite poles in science: one is truth, the other depth, unification, predictive power, and exactitude. So his different focus was rational: he was more interested in depth, unification, predictive power and increasing exactness than in proved truth, in other words in growth of knowledge rather than collecting granules of truth. Not that he ignored or repudiated truth as a regulative idea. As a few authors observed Bühler also knew that the more truth you get the less information you gain.

Depth is what you get when you realize that any explanation at a level X eventually demands a (deeper) explanation at level Y. This is what we see when looking at the relation between *Sprachtheorie* and the three aspects doctrine in *Krise*. Although in the literal history the deeper one came before the other (*Krise*) in a reconstruction one can say that his three aspects doctrine for psychology was the deeper, unifying theory that explained why his language theory was a psychological theory in a *unified psychological program*. Of course, the three aspects doctrine *also* unified three, till then opposing, streams or systems in psychology.

His *Sprachtheorie* was more powerful in predicting the sign functions than Wundt's, notwithstanding Wundt's objections that the methods used did not contribute to truth. It widened the view

⁴¹ This is probably a joke that is more or less true to life. My German teacher once told it implying that sometimes German language challenges word length: more is more.

of how humans used signs, and how it contributed to a more unified approach of psychology, semiotics, linguistics, communication theory and even cybernetics, although this unification did not occur: Bühler was “colonized” by several of these disciplines resulting in fruitful theories within the specific domains. Unfortunately, he was ignored by the Anglo-Saxon psychologists after he emigrated to USA.

From the beginning Bühler's research program was a *psychological* one; but *not* an individualistic one. The three perspectives in his study of Henry Home, his psychology of thought and his research on Gestalt perception developed into the trinity of the organon model of language, which he used as the up-step for his three aspects program for psychology as a whole. The most important elements in his program were:

- The hard core of the *Gestalt quality* to solve the problem of unity,
- The positive *heuristic of the trinity* wherever there was a separation,
- *Psychology as a life science* and therefore oriented at the social instead of individual stance.

These were the hard core and heuristics that steered Bühler's program.

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