Studies in History and Philosophy of Biological and Biomedical Sciences 43 (2012) 462–472

Contents lists available at SciVerse ScienceDirect

Studies in History and Philosophy of Biological and Biomedical Sciences

journal homepage: www.elsevier.com/locate/shpsc

Bühler and Popper: Kantian therapies for the crisis in psychology

For Lorraine Daston and Gerd Gigerenzer

Thomas Sturm

Departament de Filosofia, Universitat Autónoma de Barcelona, E-08193 Bellaterra, Barcelona, Spain

ARTICLE INFO

Article history:
Available online 29 November 2011

Keywords:
Bühler, Karl
Popper, Karl
Crisis
Psychology of thinking
Linguistics
Kantianism

ABSTRACT

I analyze the historical background and philosophical considerations of Karl Bühler and his student Karl Popper regarding the crisis of psychology. They share certain Kantian questions and methods for reflection on the state of the art in psychology. Part 1 outlines Bühler's diagnosis and therapy for the crisis in psychology as he perceived it, leading to his famous theory of language. I also show how the Kantian features of Bühler's approach help to deal with objections to his crisis diagnosis and to aspects of his linguistic theory. Part 2 turns to Popper's dissertation, completed in 1928 under Bühler. I analyze Popper's disapproval of Schlick's physicalism in psychology, as well as Popper's attempt to extend Bühler's Kantian strategy to the domain of the psychology of thinking. In conclusion, I indicate how these approaches to the crisis in psychology differ from Thomas Kuhn's notions of crisis and revolution, which are still all too popular in current philosophical discussions of psychology.

© 2011 Elsevier Ltd. All rights reserved.

When citing this paper, please use the full journal title *Studies in History and Philosophy of Biological and Biomedical Sciences*

How is psychology possible?
Thus Kant would ask in our situation.
(Bühler, 1927, p. 29)

1. Introduction

Contemporaries to stellar thinkers get studied mostly in terms of their benefit for the great minds. Naturally, that is not always the case. But it does hold for the development of Karl Popper. Young Popper began at the Pedagogic Institute in Vienna, working, too, at the university's psychological laboratory, and graduating in 1928 under the guidance of Karl Bühler (see Hacohen, 2001). The dissertation *Zur Methodenfrage der Denkpsychologie* [*On the Question of Method in the Psychology of Thinking*] discussed important works by Popper's examiners: *Allgemeine Erkenntnislehre* [*General Theory of Knowledge*] (1918, 2nd ed. 1925) by Moritz Schlick and *Die Krise der Psychologie* [*The Crisis of Psychology*] (1927, 1990) by Bühler.

This paper concentrates on the relationship between Bühler and Popper, which exemplifies an interesting chapter in the complex history of the relation between psychology and philosophy. To be clear about my intentions from the outset, I distinguish two questions:

(A) What is the relation between Popper's initial work in psychology and his subsequent critical rationalism in the philosophy of science?
(B) What philosophical assumptions and arguments do Bühler and Popper use in reaction to the perceptions of a crisis in psychology?

Today (A) clearly dominates the literature on the relationship between Popper and Bühler, including discussion of Popper's dissertation. Three main directions are discernible. First, some authors detect distortions in Popper's autobiography where he claims to have developed his critical rationalism, albeit clumsily, as early as the 1920s (Popper, 1976, p. 29; see Gattei, 2004; Hacohen, 2001; ter Hark, 1993, 2003, 2004). Second, we find a

E-mail address: tsturm@mpiwg-berlin.mpg.de

1369-8486/$ - see front matter © 2011 Elsevier Ltd. All rights reserved.
doi:10.1016/j.shpsc.2011.11.006

complaint that Popper later, as a philosopher of science, downplayed Bühler's influence and that of other psychologists, perhaps fearing psychologism in logic and epistemology (ter Hark, 1993, 2003, 2004). Third, there is some disappointment that Popper, having started in the psychology of thinking (*Denkpsychologie*), subsequently discredited the empirical study of human thinking by sharply distinguishing the discovery from the testing of scientific hypotheses (Popper, 1934). We find him accused of having made irrelevant the study of creativity and discovery, and of having created a questionable divide in science studies (Kurz, 1996). These readings illustrate greater interest in Popper than in Bühler. And clearly Popper did become one of the most influential philosophers of science of the last century, while Bühler remained "merely" an influential philosopher-psychologist of the 1920s and 1930s, ignored or forgotten after his forced exile in 1938.[1] Today he is known chiefly only among historians of psychology, and among linguists, due to parts of his work that I shall also have reason to discuss.

The literature mentioned above is not uncontroversial, but I shall not address that here. Instead, I focus on (B) above, which has been taken too lightly, if not disregarded altogether. The neglect is unsatisfactory, both historically and philosophically. Historically, because the actual context of Popper's (1928) dissertation were the 1920s declarations over a crisis in psychology. How did Bühler and Popper react to these discussions? For what did they argue and were their arguments adequate responses to the (perceived or real) crisis of psychology? As I shall show, Bühler and Popper viewed the crisis in a rather moderate way, and tried to deal with it in a *Kantian* way: philosophical reflections about science have to identify and clarify nonempirical—in their case, methodological—presuppositions of actually existing empirical research and knowledge. Thus, the solution to the crisis is not to start from scratch. Both authors start from the fact that there *is* a psychology, or that there are respectable instances of psychological knowledge, and asks under what conditions this is possible. Philosophically, this approach can help us to reconsider a still popular concept of crisis in science, namely Thomas Kuhn's. According to Kuhn (1962/1970), scientists rarely diagnose their own field as being in a crisis; and crises are not always overcome by conscious rational efforts, but often by an impersonal scientific revolution. In stark contrast, Bühler's approach illustrates how 'crisis' can be an actor's concept, and shows how philosophical reflections on a crisis can be so closely intertwined with existing science that questions of deep discontinuity do not arise.

In Part 2, I outline Bühler's diagnosis and prescribed therapy for the crisis as he saw it. In Part 3, I discuss Popper's critique of Schlick's physicalism, as well as Popper's attempt to extend Bühler's Kantian remedy to thought psychology. In Part 4, I briefly reflect on how their approach compares to Kuhn's notions of crisis and revolution in science.

2. Bühler on crisis in psychology

2.1. Diagnosis: A temporary and constructive, not a permanent, or destructive crisis

Bühler's book (1927) clearly is part of a debate that many psychologists and philosophers enjoyed or felt a need to engage in. Beginning with Rudolf Willy's (1897, 1899) publications in the late nineteenth century, crisis discussions accumulated, especially during the 1920s (e.g. Caparrós, 1991; Driesch, 1925; Fritsche, 1981; Hildebrandt, 1991; Kostyleff, 1911; Maiers, 1988; Pléh, 1988; Politzer, 1929; cf. Vygotsky, 1927; and the contributions to this volume). As Bühler (1926a, p. 455) remarked, "one can even read in the newspapers that psychology has entered a crisis."[2] He penned one such newspaper article himself, presenting a short version of his views (Bühler, 1926b).

Bühler did not comment on the debate as a mere observer. Many authors of the time saw one major cause of the crisis in the breakdown of psychology's earlier theories of sensation and association normally associated with Wilhelm Wundt and his school (e.g., Driesch, 1925; Kostyleff, 1911; Koffka, 1926). Bühler had played a major role there. Starting in 1906, he had worked as an assistant to Oswald Külpe, then the head of the Würzburg school of the psychology of thinking. Much to Wundt's dismay, Külpe—who had started as a follower of Wundt—and other members of that school tried to show that experimental methods could be applied to higher-order mental phenomena such as thought, judgment, and volition, and that the results of their studies undermined sensationalism and associationism (Kusch, 1999; Mülberger, 1994). What is more, it was none other than Bühler (1907, 1908) who got involved in a famous dispute with Wundt (1907, 1908) over the possibility of experimentally-based introspective self-reports of such activity. Members of the Würzburg school saw their own emergence and work as a threat to the Wundt school in psychology. Alfred Binet (1911), for instance, felt that the Würzburg research signaled crisis, perhaps even "revolution" in psychology (see also Kostyleff, 1911; cf. Mülberger, in press).

Bühler's diagnosis of crisis was first published in 1926 as an extensive article in the journal *Kant-Studien*. He had been invited to do so by Paul Menzer, then co-editor of the journal and an important Kant scholar. That was no coincidence. In his teaching at the University of Vienna, Bühler alternated between philosophy and psychology (the designation of his chair being "Philosophy with special consideration of psychology and experimental pedagogics"; Lebzeltern, 1969, p. 26). In philosophy, he taught mostly logic and epistemology, often on Kant. Appropriately, he contributed a number of articles to *Kant-Studien* (Bühler, 1926a, 1928, 1933, 1935), some of which are among his most important publications. Despite contacts with Schlick, Carnap and Neurath, Bühler was not a member of the Vienna circle and certainly did not subscribe to some of its basic tenets. He developed serious reservations about Carnap's (and others') physicalism. However, those reservations can be found only in his publications in the 1930s (Toccafondi, 2004; see Section 3.5 below). Another reason, present as early as 1926, was that Bühler felt unable to endorse the Logical Empiricists' dismissal of Kantian questions, methodology, and perhaps also their rigid denial of the synthetic *a priori*. In any case, as I shall show, his response to the claim of crisis has distinct Kantian features.

Bühler's analysis of the crisis in both his article (1926a) and book (1927) is complex and highly nuanced. He did not take the claim of crisis in psychology at face value, nor did he completely deny that there was something to be said for it. Instead, he reflects the very notion of crisis itself in the course of presenting his own diagnosis and suggestion for therapy. His conceptual remarks on the "crisis" can be described by four interrelated claims:

(1) *Temporality of the crisis:* Bühler does not agree with the assumption of permanence. Willy (1897) had diagnosed a "chronic" crisis in psychology caused by Wundt's

[1] When the German Nazi government took control of Austria in 1938, Bühler was imprisoned for about six weeks (so-called "protective arrest", *Schutzhaft*). He had been part of the social-democratic school reform movement and was accused of having been philo-semitic—his wife Charlotte was Jewish. He was given the choice of retiring or emigrating. He spent the rest of his life in the USA, where he never attained a satisfying position, and had difficulty publishing; see Ash (1988), Brock (1994), Eschbach (1984b).

[2] Translations are mine.

experimental psychology, and by the investigations of Franz Brentano, William James and others as well, hiding behind problematic metaphysical assumptions.

(2) *Realm of the crisis:* Bühler does not think that only certain branches or approaches within psychology are in a crisis. For him, psychology as a whole is in a state of crisis.

(3) *Direction of the crisis:* Bühler denies that the psychology of the time suffers from "decay" (*Zerfall*). Instead, he says, it shows signs of a "constructive crisis" (*Aufbaukrise*) resulting from many differing theoretical and/or methodological approaches that have yet to be unified: "The number of co-existing psychologies that we have today, the number of simultaneous approaches based on isolated initiatives, has probably never before existed" (Bühler, 1927, p. 1) Psychologists, he says, are faced with an "*embarras de richesse*" (ibid.). This he contrasts with psychology from around 1890 when associationism was seen as the legitimate superior approach that at least offered something like a "common program and a shared hope" (ibid. p. 1; cf. pp. 2-9). Once the limits of that approach had been fathomed, psychological research became guided by at least three general programs all basically characterized by their method of preference: There was *Erlebnispsychologie* with its commitment to "subjective experience", then the behaviorist call for focus on inter-subjectively observable behavior, and finally *geisteswissenschaftliche* psychology as espoused by Wilhelm Dilthey and Eduard Spranger (1926). The latter two had claimed that to adequately understand the mind one must study "the objective mind's formations" (*Gebilde des objektiven Geistes)* such as art, architecture, and science.[3] According to Bühler, not only does each of these approaches favor one specific methodology, often claiming that it alone is expedient, but the dissimilar preferences also end in disparate views about what the basic subject matter of psychology actually is, whether it be subjective experience, behavior, or the products of the objective mind.

(4) *Opportunity arising from the crisis:* Bühler felt that the crisis brings forth the opportunity to state more clearly certain philosophical preconditions of psychology, and to thereby explore just what constitutes the identity of the discipline. This will be explained in the following.

2.2. Therapy: Three methodological aspects

Given this diagnosis of the crisis, the slant of Bühler's therapeutic advice should be fairly obvious. He claims that one can and should combine the three aspects of subjective experience, meaningful behavior, and the formations of the objective mind. He goes on to argue that it is not only possible to combine these three aspects—it is necessary as well.

Now, perhaps contrary to expectation, Bühler does not suggest this solution for all parts of psychology, but for one only, namely, for the theory of *language*. Yet, this example is central both to Bühler's own work and to his understanding of the major tasks of psychology in general. His interest in language was longstanding (Bühler, 1909, 1918, 1922, 1923; cf. also 1934, p. xxviii) and, moreover, closely bound to the earlier program of the psychology of thinking (see Eschbach, 1997). As he claimed, one major task of linguistic theory is to explain "how linguistic signs get interpreted" (*Deutungsvorgang*) to mean the representation (*Darstellung*) of an objective state of affairs. This is important because according to

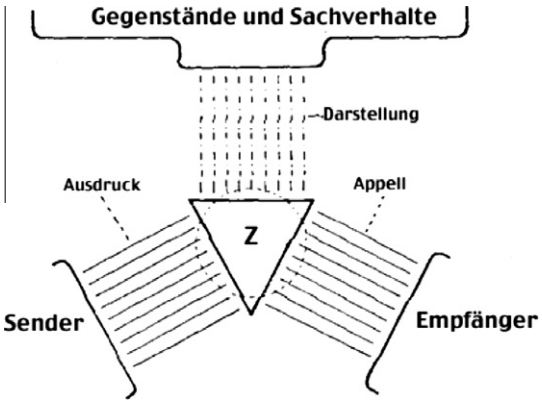


Fig. 1. Bühler's model of the functions of language: Linguistic signs ("Z" = "Zeichen") are tools that relate sender (*Sender*), recipient (*Empfänger*), and the world in which they live (*Gegenstände und Sachverhalte*) (from Bühler 1934, p. 28).

Bühler—as we shall see—representation is a basic function of language and, indeed, the function most distinctive to human users of language. He claims (1923, p. 288 fn. 2) that "for almost 20 years modern psychology of thinking has been preoccupied with understanding this interpretative process". That is perhaps exaggerated, but probably not overly so. In 1909, he had claimed that in order to function as representations, linguistic signs must be assigned to objects or states of affairs in some lawful manner that cannot be achieved by observing the mere physical or phonetic characteristics of those signs. More positively, understanding the meaning of a sentence requires that at least some logical connections be made between familiar and unfamiliar thoughts. Bühler (e.g. 1909, p. 117) coined a phrase that was to become part of everyday speech in German, the so-called "ah-ha!-experience" (*Aha!-Erlebnis*, meaning "I see!" or "I get it") to describe the experience of understanding the meaning of a sentence. While thought psychology had not explained the interpretative process or the laws governing the assignment of terms to things or states of affairs, it had revealed that the process and laws were much more complicated than had been formerly assumed.

For the purpose of the following discussion, it is necessary to briefly sketch Bühler's linguistic theory. I confine the sketch to the elements already contained in the works on crisis. Bühler (e.g., 1928, 1931, 1932, 1933) continued to develop them, culminating in his brilliant *Sprachtheorie* [*Theory of Language*] (1934, 1990). This elaborate theory today counts among the classics in linguistics, alongside de Saussure (1916) or Chomsky (1965), and is now described as a major step towards a pragmatic account of language (cf. Eschbach, 1984a, 1988; Friedrich & Samain, 2004; Graumann & Herrmann, 1984; Mulligan, 1997; Pléh, 1984; Ströker, 1969).

What, then, connects the aspects of subjective experience, behavior, and the formations of the objective mind in language? Since Bühler wants to show that it is possible to unify psychology, he claims—not implausibly—that there must be a "yet unknown unity to which experience, behavior, and the products of mind, as constitutive moments, belong" (Bühler 1926a, p. 466). In the case of language, that "unity" is the linguistic sign or, more precisely, the concrete speech act in which a linguistic sign is used. Now, speech acts are *tools* used for certain purposes or functions (see Fig. 1). In his so-called "organon model" of language, Bühler identifies three such functions as basic: expressing experience (*Kundgabe;* in Bühler (1934, p. 28): *Ausdruck*), inducing behavior in others (*Auslösung*; in Bühler (1934, p. 28): *Appell*), and represent-

[3] Bühler examines a number of other approaches as well, such as psychoanalysis and Gestalt psychology, not all of which can be easily subsumed under any of the three main programs.

ing (*Darstellung*) objects or states of affairs (see Fig. 1).[4] From the point of view of the sender, the sign is a "symptom", namely, of what he experiences; considered in the relation between sender and recipient, the same sign functions as a "signal". Used to refer to an objective state of affairs, the sign is to be described as a "symbol". Bühler says that none of the three functions can be reduced to one (or two) of the others.[5] For instance, he rebukes Wundt (1926a, p. 466, 1927, p. 30f.) for depicting language as a mere tool for the expression of one's own experiences. Behaviorists, on the other hand, strive to explain language in terms of behavior only, without realizing that from among all the behaviors we must try to select those that have a meaning or purpose for the agent, e.g. when we use language to direct actions of other human beings (again, those who study language merely as acoustic systems make the same mistake: Bühler, 1927, p. 46f.). Other reproof applies to those who consider language only as an objective product of the mind. Thus, to study language comprehensively, all three aspects must be taken into account. In addition, the three functions are systematically interrelated. In a simple case, when one sees a fire, one expresses one's experience by uttering the words that represent the state of affairs; but the same linguistic expressions can also be used to direct the actions of one's fellowmen regarding the fire.

Bühler's *Krise* received more attention than any other contribution to the debate. It inspired Husserl's (1936) broader analysis of the crisis of the sciences (Feest, this volume), and was taken up afresh by some of his students and other psychologists in their own reflections on foundational issues in psychology and the state of psychology in general (Hofstätter, 1941; see Gundlach, this volume; Lersch, 1953; Wellek, 1958, 1959). Also, since the 1970s *Krise* has been used in presidential addresses at conferences of the Germany Psychological Society (*Deutsche Gesellschaft für Psychologie*) that attempted to clarify whether psychology's lack of unity has waxed or waned and whether such unity is desirable at all (e.g. Allesch, 2001). Despite some controversy, Bühler's *Krise* has been described as the most valuable contribution to such reflection to this day (e.g. Allesch, 2003; Allport, 1966, p. 201; Fritsche, 1981, p. 66; Münch, 2002).[6]

2.3. The Kantian character of Bühler's approach

There is little dispute then and now over the core elements of Bühler's diagnosis and therapy. Less agreement exists on whether or not to accept that diagnosis and therapy. It is impossible to detail the objections here, if only because many consist of claiming that psychology went on to produce more novel approaches or become characterized by divides other than those identified by Bühler. It is striking, though, that virtually none of the critics adequately recognizes the basic nature of Bühler's approach: its *Kantian* features.[7] This matters, however, if we are to do justice to his approach. I shall first explain this approach and then discuss how it can help to deal with certain problems.

Two features are salient: goal and method. With reference to Kant, Bühler (1927, p. 29; cf. 1926a, p. 466) describes his goal as to explain, "how is psychology possible?" The inquiry is supposed to be identical with the task of discovering the underlying unity that integrates the three aspects, thereby solving the crisis. Bühler calls the method or type of argument suitable for this task a "kind of a transcendental deduction in Kant's sense" (ibid.). As we shall see (3.1.), in his dissertation Popper (1928, pp. iii and v) assents to these features, crediting Külpe with stating the method more clearly than Kant himself and emphasizing its utility, namely, as an analysis of the presuppositions of existing science. Külpe was plausibly also a source of Bühler's views.[8] In any case, for such a method to commence at all, a certain amount of research and theory in the relevant domain must already exist. More precisely, and to prevent possible misunderstandings, the transcendental method or deduction proposed by Bühler (and Popper) can be called "weakly" Kantian. Three points help to explain what I mean here.

(i) Kant distinguished between two versions of his (in)famous transcendental deduction of the categories (see Carl, 1989, pp. 158–171). One version starts from the premise that we do have empirical knowledge of objects (i.e., experience in the sense of empirical judgments that have the connectedness and structure that allows them to be true or false), and proceeds from there to the identification of the necessary conditions under which that knowledge is possible. The other version does *not* use that premise. Rather, it starts from a general investigation of what the structure of our epistemic capacities must be like for our experience to be about determinate objects. The first is called an "objective", the second a "subjective" deduction (Kant, 1998, p. Axvii).[9] An objective deduction is weaker than a subjective one because the former uses a premise that may be questioned, namely, that we do indeed have such objective knowledge.

(ii) Now, many late nineteenth and early twentieth century philosophers turned from the Kantian question of how knowledge in general (*Erkenntnis überhaupt*) is possible to the question of how specific kinds of *scientific* knowledge are possible (a question Kant had also raised, and which he answered by proposing more specific *a priori* concepts and principles for the case of physics—concepts and principles, that is, that define or constitute the concept of material

[4] Ter Hark (2004, p. 117) misrepresents Bühler's views. The function of inducing behavior in others isn't mentioned, and instead *Kundgabe* and *Ausdruck* are viewed as two different functions rather than two terms Bühler used at different times for the same function.

[5] The constructive doctrines of *Krise* are amplified in Bühler's later works (especially 1993, 1934). Here, the three basic functions of language make up the first "axiom" (called "A") of his theory of language. To this, three further axioms are added (see Mulligan, 1997): (B) There are three basic kinds of linguistic entities: symptoms (criteria, indicators), symbols, and signals. (C) One can and should distinguish two different levels of formalization for (A) and (B): *Sprechhandlung* and *Sprachwerk*, *Sprechakt* and *Sprachgebilde*. *Sprechhandlung* and *Sprechakt* are subjective in the sense of being related to a performer of linguistic activity; the former is a token of the latter, which is a type. In contrast, *Sprachwerk* and *Sprachgebilde* are formalizations independent of subjects, *Sprachwerk* refers to the result of a *Sprechhandlung*, and so is a token of the type named *Sprachgebilde*. (D) The two basic kinds of *Sprachgebilde* are words and "fields", which are mutually dependent or internally related. There are verbal and non-verbal fields. Verbal fields are sentential, non-verbal fields are deictic.

[6] Reception of Bühler's *Krise* has to a large extent also been guided by an interest in his theory of language. The theory became recognized in central Europe by psychologists and through research groups such as the Prague linguistic circle. New German editions of *Krise*, *Sprachtheorie,* and other works appeared as of the 1960s. In the Spanish-speaking world, reception began even sooner. *Sprachtheorie* was translated into Spanish in 1950, and experienced several editions; *Crisis* followed (Bühler, 1966). Also, as early as 1941, a dissertation was published on Bühler's linguistic theory (Ceñal Lorente, 1941). In English- and French-speaking countries, in contrast, reception of all parts of Bühler's work was slower.

[7] I agree here with Kamp (1984, p. 47), who discusses the philosophical aspects of Bühler's linguistic theory. Of course, I do not deny the influence other philosophers, such as Husserl, had upon Bühler. My point is that his dealing with the *crisis* is in important respects Kantian.

[8] See e.g. Wettersten (1985) and Kurz (1996). However, the notion of a "transcendental deduction" or method in this sense was in the air. Hans Reichenbach (1920) employed a similar strategy in his study of Einstein's relativity theory. Kurt Lewin (1927, pp. 375f.) proposed a related characterization of epistemology when he diagnosed a crisis in psychology based on a new phase of concept formation, important for the development of the discipline from a speculative system to an investigation truly aimed at concrete research objects.

[9] Kant appears to have presented the two versions in distinct sections of the *Critique of Pure Reason*: namely, the less demanding "objective" deduction at pp. A92–93 (cf. again p. Axvii), and the more demanding or "subjective" one in the extended arguments at pp. A95–130 (or, in the 1787 edition, pp. B129–169).

objects). Bühler and Popper comply. Now, in pursuing this kind of question, they refer to the moderate, objective conception of a transcendental method or deduction, and apply it to the case of knowledge in psychology. For instance, it is assumed that there exists some empirical knowledge of language; and then the question is how, for instance, a unified analysis of language is possible.

(iii) Bühler (e.g. 1927, pp. 1, 32, 50f., 55; 1934, 12–24) aims for "axioms" for linguistics, and it is clear that the validity of these axioms relies neither on logical nor conceptual grounds alone, nor is it derived from observation and experiment. While he carefully notes that one should not, from the start, "say what is a priori and what a posteriori about them", he also says that the axioms are "constitutive" and "define the domain", or that they are "ideas for induction necessary in every field of research" (Bühler, 1934, p. 20f.). Thus they are nontrivial and necessary conditions for a unified empirical theory of language. Also, this clearly echoes the Kantian idea of the categories and principles of the understanding as being constitutive for objects of knowledge *überhaupt*, and for specific *a priori* concepts and principles constitutive for the domains of various sciences as well.

Bühler and Popper do not commit themselves to more demanding Kantian assumptions. They do not claim that the relevant presuppositions of empirical research cannot be revised, nor that they are strictly universal (cf. Ströker, 1969, p. 21). And they circumvent other difficulties as well. For instance, they do not endorse transcendental idealism about the objects of knowledge—certainly not in the sense that transcendental idealism is often understood as the view that the mind "makes" nature.[10] But one need not subscribe to such assumptions to be a Kantian in important respects.

2.4. Three objections and how to deal with them

Now consider the following three questions:

(1) Is the connection Bühler draws between his previously developed linguistic theory and the application of that theory in the solution of the crisis in psychology a dubious ex-post rationalization of the theory?
(2) Must language be understood through the three aspects of subjective experience, meaningful behavior, and the formations of the objective mind, and these aspects alone?
(3) Can Bühler's approach be applied to other domains of psychology?

While I shall respond to the first two questions immediately, it is best to deal with the third in connection with Popper's attempt to extend Bühler's therapeutic strategy (see 3.4).

As to question (1), the answer is no. Of course, knowing the correct chronology of Bühler's development is important in order to negate the assumption that his linguistic theory is a direct outcome of the crisis debate in psychology. Bühler (1927, p. 29) freely concedes that what he uses as an example for curing the crisis—the core of his linguistic theory—was, by and large, completed prior to the diagnosis of the crisis. Indeed, the distinction of the three basic functions had already been stated several years before (Bühler, 1918, p. 1). Thus, he first worked on a psychological theory of language, and then found that it might be used to cure the crisis. We therefore cannot use this story as an instance of how a crisis in psychology was overcome by a dramatic shift in theory, even though Bühler's theory of language has been described as "revolutionary"—terminology, incidentally, that he himself never used anyhow. However, his procedure is perfectly legitimate if one takes into account the Kantian character of his argumentation. If a "transcendental deduction" reveals that linguistic theory must take subjective experience, behavior, and the formations of the objective mind into account, and if this constitutes a befitting solution to the crisis as described by Bühler, then the chronological order of the development of diagnosis and remedy is irrelevant.

Other problems remain, however. The theory can be seen as a successful example for how to overcome the crisis in psychology only if we concur with the diagnosis. There are some reasons to doubt that we should. One might claim that the crisis is not due to a temporary fragmentation of methodology or aspects as Bühler describes it. Such an objection may take on two forms: First, one might object to specifics of Bühler's characterization of the fragmentation in psychology, or propose other distinctions for schools or methods. Politzer (1929, p. 15f.), for instance, found Bühler's description of behaviorism too simplistic. Again, Vygotsky (1927; see Hyman, this volume), though not in explicit opposition to Bühler, distinguished along Marxist lines between idealist (which he equated with subjective) and materialist (objective) traditions in psychology. Neurath (1933, p. 16f.) denied that, from a physicalist point of view, talk of "aspects" is reasonable at all. As we shall also see (Section 3.2.), Popper (1928) found Bühler's discussion of physicalism insufficient. A full reply to these points would require a careful comparison of alternative diagnoses, as developed both during Bühler's own time or by later historians. Here it suffices to mention that there existed a serious fragmentation among schools of psychology, that Bühler's description of the fragmentation was not entirely wrong, and that his diagnosis concerned only the situation of psychology *at that* time. A second objection is that the crisis may have been due to more complicated metaphysical assumptions implied in psychological research and theorizing. If that were the case, then Bühler's approach would fail from the start because it is not aimed at a permanent or chronic crisis. Yet, as noted above (Section 2.1.), he does not take at face value any such claims that the crisis is chronic. That is, at least to some extent, only fair. While one may be right or wrong about the specific diagnosis of a crisis in psychology, such judgments depend on assumptions about a more ideal state of the discipline, and such judgment must, by necessity, make use of normative criteria. We must therefore be careful of crisis talk. It relies on standards that are not innocent, and that demand reflection and argumentation. Compared to the skepticism implied by claims of a permanent crisis of psychology, the sober reconstruction of presuppositions made by actual psychological research seems a more plausible choice.

Another set of objections brings us to question (2) above. The quality of Bühler's argument also depends on what we think of the central premises of his "deduction"—that is, on the psychological knowledge to be taken for granted. Can language really only be understood via the three aspects or functions? That language, that the same linguistic sign can perform several functions has rarely been a matter of doubt (but see Dempe, 1935; Bühler, 1936). However, there are other questions, three of which I shall briefly address here: (2a) Was the theory of language advanced enough to derive or explicate its presuppositions? (2b) Can one unify the schools *in psychology* by means of the doctrine of different aspects of language? (2c) Did Bühler get the *number of aspects* right?

(2a) In a review, the philosopher and Kant scholar Arthur Buchenau (1928, p. 74f.) asked:

> "Under these three guiding aspects, Bühler . . . raises the question following the example of Kant's: How is psychology as a science possible? And just like Kant used mathematical natural science, so Bühler uses the science of language, or better: the

[10] Strawson (1966) developed such an interpretation; for a critique, see Allison (1983). I need not enter this issue here.

phenomenon of language, in order to explain his claims, a procedure which however is not entirely without problems. In contrast to the Newtonian system that Kant found and on which he—whether rightly or not will not be examined here!—could rely as a fact, Bühler's 'system' of a philosophy or psychology of language does not yet exist."

This point appears correct at first sight, but it isn't. To begin, Buchenau conflates the question of how psychology is possible with the question of how psychology is possible as a science, a question Kant himself had famously raised, but under completely different circumstances (Sturm, 2006).[11] Bühler ignores the issue of the scientificity of psychology; he is concerned with the unity of the discipline. (We shall see later on (3.2) that there were other reasons to connect these different foundational questions about psychology, though.) Also, it is misleading to question his approach by pointing out that it cannot rely on an already completed theory of language. It is enough to have various competing empirical research programs; and, as Bühler admits, his axioms can always be revised if linguistics makes advances.

(2b) The Prague psychologist Franz Scola (1931) attacked Bühler's assumption that if one can study language through the three aspects, this implies that linguistics as a whole must be seen as part of psychology. However, we should view phonetics, grammar, and the psychology of language as different disciplines. In Scola's view, we should better treat the psychology of language as being concerned all and only with the aspect of "inner perception" (*innere Wahrnehmung*), whereas phonetics studies the publicly audible linguistic noise, and grammar the objective formation of the mind. Thus, Bühler's linguistic theory could not provide a convincing example for a solution of the crisis in psychology—it would rather signal the fragmentation of different scientific fields. Scola admitted that it might occasionally be useful for a psychologist of language to look at what grammarians or those who study phonetics think; but only methodologically or heuristically, not as something to be taken up in the results of psychological research.

This reasoning overlooks another Kantian feature of Bühler's model: the three functions are separate, but they are also *related*. Language is a tool for expressing one's thoughts; but, in basic and typical cases, this expression is directed at a receiver and at states of affairs that both sender and receiver have access to and can talk about. One might try to avoid understanding language as such a tool for communication; but then one misses the point of Bühler's fruitful idea of language. He does not call for an integration of different schools or even disciplines for the purpose of learning from one another, but because he proposes a determination of the very subject matter of a theory of language. He aims to provide axioms that "constitute" or "define the domain" of such a theory.

(2c) Popper (1976, p. 74; 1972/1979, p. 160 fn. 9) claims to have objected, in the oral examination to his dissertation, that stating an *argument* or providing a *critique* to another person's claim is irreducible to any of Bühler's three functions. More generally, it is unclear whether what Searle (1969) has called "perlocutionary acts"—such as ridiculing or persuading someone, or aggravating a person by one's words—can be reduced to any of these functions. However, Bühler (1934, pp. 21–22) freely admits that there may be room for further basic functions. Once again, the strategy is only weakly Kantian: while Bühler claims to identify necessary conditions for psychological claims about language, he does not claim to have found the complete list of such conditions.[12] Moreover, this may even strengthen his strategy for overcoming the diversity of approaches in psychology. A different description of the fragmentation among these approaches might point to a yet unrecognized function of language. Admittedly, it is not clear whether Popper's fourth function or Searle's perlocutionary acts could be traced back to an aspect emphasized by some psychological approach that Bühler failed to identify. Yet, despite these limitations, his strategy to integrate different psychological traditions by looking for an "underlying unity" with respect to which different psychological aspects or methods might be integrated is promising, and he develops it for the case of language in an impressive way. To his more charitable readers, it must therefore not have appeared unnatural to wonder whether the strategy might be extended to other parts of psychology as well.

3. Popper on the methodology of thought psychology

This last remark brings us really to Popper. His dissertation (1928) had been planned as an empirical investigation of memory, intending to carry on the tradition of thought psychology, and was based on several years of research (Hacohen, 2001; Wettersten, 1992). However, the work contains none of these empirical studies. As Popper describes it, he had already for a longer while planned to introduce his study on memory with a chapter on methodology. The material of that chapter had grown and in the end interested him more, so he decided to submit a treatise on methodological problems of psychology (Popper, 1928, p. v). A little later, he published an essay on memory that may have been based on that previous research (Popper, 1931).

As said above, the dissertation discusses especially Schlick and Bühler. While it does not explicitly diagnose a crisis in psychology[13], it is very clear that Popper follows Bühler's *Krise*, trying to extend its positive message into a new domain of psychology. Later in life, Popper (1976, p. 78) described his dissertation topic as something to which he never returned, characterizing his study as weak. Both claims need qualification. First, although Popper indeed never returned to the methodology of psychology, his later theory of the "three worlds"—the physical world, the mental world, and the world of objective ideas or thought-contents—looks very similar to some of his dissertation results. The theory also bears marks of being strongly influenced by Bühler's linguistics; for instance, in presenting his three-world theory Popper included his own reaction to Bühler's theory (e.g., Popper, 1972/1979, p. 160 fn. 9; cf. Hacohen, 2001, p. 160; ter Hark, 2004, ch. 6). Second, certainly Popper's dissertation is the first more extensive work of a young man and written hastily. As Bühler pointed out in his evaluation, the second half and especially the final sections of the dissertation exhibit more weaknesses than the first half.[14] Yet, the study displays Popper's ability to set

[11] A few years before Bühler's first discussion of the crisis appeared in *Kant-Studien*, the journal also published an article titled "Wie ist Psychologie als Wissenschaft möglich?" [*How is psychology possible as a science?*] (Tumarkin, 1921). Tumarkin argued, on somewhat obscure grounds, that causality cannot be properly applied in psychology, and that teleological notions are essential to it.

[12] Wettersten (1985) claims that Bühler's "axioms" do not function or even look like axioms. But even if the terminology is misplaced, the theory starts from quite basic assumptions and possesses a systematic structure.

[13] A few years later, not in connection with psychology, Popper would use the term—and in a new way. In 1932, he wrote to Egon Friedell characterizing his own upcoming *Die zwei Grundfragen der Erkenntnistheorie* (the predecessor of his *Logik der Forschung*): "My book is an epistemology, more precisely a methodology. It is a child of its own time, a child of crisis—even if predominantly a crisis of *physics*. It asserts the permanence of the crisis; if it is right, then crisis is the normal state of a highly developed rational science." ("Es ist ein Kind der Zeit, ein Kind der Krise - wenn auch vor allem der Krise der Physik. Es behauptet die Permanenz der Krise; wenn es Recht hat, so ist die Krise der Normalzustand einer hochentwickelten rationellen Wissenschaft.") Popper to Friedell, 30 June, 1932 (Engl. transl. by TS). *Hoover Institute Archives. Karl Popper Papers*, box 297, file 22.

[14] Bühler (1928b). See also Hacohen (2001, pp. 159–163).

himself a task, to structure the work clearly, and to present novel arguments. Also, it stands a comparison with other contributions to the crisis debate, and perhaps influenced later debates between Bühler and his opponents among Logical Empiricists (see Sections 3.2. and 3.5).

3.1. Goal, structure and method of Popper's dissertation

First, Popper attacks Schlick's program of physicalism in psychology. Second, Popper extends Bühler's pluralistic proposal for psychological methodology to thought psychology proper. Popper states that this is coherent with a Kantian standpoint: One uses a kind of "transcendental method" or "deduction" (Popper, 1928, pp. iii and v) by taking for granted certain empirical parts of science and analyzing their presuppositions. Epistemology may be able to occasionally provide critical suggestions, or to hint at where it might be useful to transfer a methodological idea of one science to another, but it cannot dictate to science its methods (ibid. p. ii). But there are also basic differences between Bühler and Popper. Most importantly, Popper does not simply adopt Bühler's Kantian strategy in all respects. He insists early on in the dissertation (1928, p. v) that his results are not going to be synthetic *a priori* in any sense. Thus, Popper's Kantianism is even more moderate than Bühler's. I shall consider below (3.5) what to think about this.

3.2. Why is physicalism relevant here?

First, why does Popper take up the issue of physicalism at all? Why is it relevant in the context of the crisis debate? The main point is that Popper (1928, p. 5) finds physicalism insufficiently discussed in Bühler's *Krise*. Indeed, Bühler discusses physicalism mainly in the form advanced by Gestalt psychologists. If Bühler's discussion is insufficient, then there is still a possibility that physicalism may win over his pluralism. In other words, if physicalism were correct, then we would have a better explanation for the unity of psychology than Bühler's. According to Popper (1928, p. 6), Schlick's *Erkenntnislehre* contained the best arguments for a physicalist conception of mind and psychology and was thus the most worthy target for attacking such an approach.[15]

It is important here to remember that Schlick's physicalism was primarily a *methodological* thesis, not (merely) an ontological one (Popper, 1928, p. 6). The existence of a subjective or introspective perspective for one's own mental states was not denied; what was rejected was the claim that this perspective can and should play the leading methodological role in psychological research.[16] Schlick rejected Emil du Bois-Reymond's notorious *Ignorabimus* (1872) regarding the physical basis of the mind: without "transforming introspective psychology into physiological, scientific psychology, and ultimately into a physics of brain processes" (Schlick, 1918, p. 288; cf. pp. 275, 291), psychology *as a science* remains impossible. This is why Popper becomes interested in the problem of psychology's scientific status, in difference to Bühler, who confines his considerations to the issue of the unity or identity of psychology (see Section 2.4).

But why should the scientific status of psychology be in doubt if physicalism isn't true? Briefly put, Schlick presented two major lines of argument: (i) Knowledge of the mental cannot begin with introspection, since the very possibility of such knowledge requires a reduction of mental concepts and laws to physical concepts and laws (Schlick, 1918, pp. 275, 291). I will call this the "knowledge argument". (ii) The demand for unity of science excludes any strong dualism, be it ontological or methodological (ibid., 298). As we shall see next, the second point is less present in Popper's discussion than the first. In short, he thinks that in order to argue more successfully than Bühler for the necessity and possibility of introspection in psychology, one must refute Schlick's knowledge argument.

3.3. Popper's arguments against methodological physicalism

Popper presents a battery of objections that can be summarized by the following five points:

(1) A first version of Schlick's knowledge argument claims that qualitative concepts must be reduced to quantitative ones, because only then one will be able to achieve knowledge "in such a perfect sense" (Popper, 1928, p. 9). Here Popper claims that this is an ideal of knowledge that must not be accepted by all sciences. It is unrealistic for the *Geisteswissenschaften* (ibid. p. 9f.) and, even if a physical reduction of the mental were possible, it need not be required for all sciences (e.g., not for anatomy and biology). Likewise, it need not be required for psychology (ibid. pp. 10–16).

(2) As Popper sees it, Schlick undermines his own psychophysical parallelism by admitting that (i) the mental elements united in one mind can be physically separate, and (ii) physically united elements need not belong to a single consciousness (Popper, 1928, pp. 20ff.). If these possibilites are real, then such a physicalism cannot be a useful methodological or "working" hypothesis.

(3) Popper's more important objection to the knowledge argument, however, is the following: Even if a physicalist reduction of the mental were possible, it would require the prior development of psychological theory. There can be no reduction of a set of laws *A* to another set *B* without *A* already being developed (ibid. pp. 16–18). "For psychology, psychophysical considerations are running far behind psychological ones" (ibid. p. 22).

This completes the discussion of Schlick's knowledge argument. Popper adds two further points:

(4) Concerning the unity of science requirement: Contrary to appearances, Schlick does not support this aspect of his physicalism with epistemological reasons. Stated differently, physicalism is as dogmatic as the *Ignorabimus* thesis (ibid. pp. 39ff.).

(5) Physicalism cannot be assumed *a priori*, but must be justified empirically. The latter is not yet achieved, and it should be treated as an open issue whether it can ever be achieved (ibid. pp. 43ff.). To think otherwise would mean to assume physicalism as a metaphysical hypothesis, which Schlick himself clearly does not intend to do.

To sum up, Popper objects to methodological physicalism that it ends in useless if not impossible positions, and that it tends to become a dogma. He also emphasizes that "psychophysical considerations" need to be added as a fourth aspect to a unified psychology,

[15] Later as well, he thought highly of Schlick's book (e.g., Popper, 1976, p. 188).

[16] Consistent with this, Popper connects his objections to this physicalism with objections to the Gestalt psychologists' psycho-physical parallelism. Psycho-physical parallelism was an assumption already in Gustav Theodor Fechner's experimental work, by which he tried to establish a quantitative relation between the mental and the physical. "Parallelism" suggests that Fechner or later adherents of this view were ontological dualists. However, they were not, at least not with respect to substances (their views about mental and physical *properties* are more difficult; see Heidelberger, 2000). For Fechner and for Wundt, the most important aspect of psycho-physical parallelism was its role as a working hypothesis (*Arbeitshypothese*) for empirical research.

thereby indicating again that Bühler's analysis of the three basic aspects was not complete (Popper, 1928, p. 43).[17]

3.4. Extending Bühler's therapy: The three aspects of the domain of thinking

What about Popper's arguments in the second half of the study? Bühler (1927, p. 59) limits his preoccupation to language, claiming that dealing with the crisis in psychology must be done in a piecemeal manner; but he also states that it would be easy to transfer the approach to other parts of psychology (ibid., p. 29). His argument makes a distinction between thinking and language that is clearly on Popper's mind when he asks whether the three-aspect methodology can be extended to the domain of thinking. This subject matter probably strikes him as a most interesting domain to which to transfer Bühler's approach, both because of the centrality of the topic of thinking for anyone influenced by the Würzburg school, and because of Popper's previous empirical research on memory, which he views as a natural part of the domain of thought psychology.

Now, Popper emphasizes that he does not attempt to transfer Bühler's *results* (the functions of language or the axiomatization of linguistic theory) to the domain of thinking. This, he argues plausibly, would amount to constructing analogies that might not work in the new domain. Popper's approach parallels Bühler's only in its transcendental *procedure*: Methodology ought to "start from methods actually used in science and investigate them critically" (Popper, 1928, p. 47). His claims about why the three aspects of experience, behavior, and formations of the objective mind are necessary in the study of thinking can be summed up as follows.

(I) *Meaningful behavior*. Popper starts from a plausible point taken from Bühler (1927, p. 47; see 2.2. above): The goal of behaviorism to exclusively study stimulus-response schemata is misguided. One cannot avoid selecting those behaviors that are *meaningful*. Bühler makes use of the study of animal behavior here: to observe what conditions may hinder an animal's behavior necessarily means to interpret the animal's reactions as having a purpose. In his discussion, Popper introduces an important distinction: (i) a behavior may have a purpose (*Zweckhaltigkeit*) and (ii) the behavior may moreover be purposive (*Zweckhaftigkeit*). When a dog barks to warn his master that a stranger has entered the house, this behavior has a purpose and is also purposive. But when the dog barks at a train, the behavior can have a purpose without having purposiveness. Only given such a distinction can one interpret a subject's actions as "erroneous" or misguided (Popper, 1928, p. 50f; for an analysis of his use of animal psychology, see ter Hark, 2004, pp. 119–125).

(II) *Formations of the objective mind*. Instead of focusing on the function of external representations—e.g., representations such as linguistic signs—for the study of thinking, Popper here asks for the function of thinking *in* representation. A standard view he finds in the claim that thinking provides meaning or sense to objective signs (ibid. p. 61f.). He argues that this position runs into difficulties that concern psychology, epistemology, and logic as well. If we assign a certain linguistic expression to a particular object, that expression is a "name". But what about classes of objects? How could a sign stand for a potentially infinite number of objects? Likewise, what does a sentence refer to? A thought, an objective state of affairs, or both? Popper notes that he cannot solve these problems, but that any answer would require a close analysis of the relations between the disciplines mentioned (ibid. p. 63). Such an inquiry could be called "semasiology", as exemplified by Heinrich Gomperz' work. One of its tasks would be to identify the differences between the empirical regularities of thinking and the laws of logic (logic being an objective formation of the mind). This would help to avoid the error that the psychology of thinking would have to be guided by logic—an error said to be the converse of psychologism in logic (ibid. p. 65). So, Popper here argues that in order to study thinking adequately, one must take into account how it resembles, and differs from, one of the objective products of the mind, namely logic. However, he thinks that another path might also be possible, and also potentially richer. One might opt for biologically oriented theories of the value of objective representations—for instance, theories about the evolution from primitive cultures to natural science over such stages as magic ritual, dogmatic speculation and critical science (ibid. 66–70). Popper does not decide really which way to go; he basically just points out that such ways exist.

(III) *Experience*.[18] Here Popper (ibid. p. 70f.) finds the justification trivial because he assumes that thoughts are primarily accessible through subjective experience. The question is more *what is it like* to have thoughts: How do they appear when studied introspectively? As associations of ideas? Feelings? Experiences of sense? Gestalt experiences? Judgments? Popper also defends experimental introspection, especially as practiced by Külpe or Bühler, from widespread objections, such as concerning individual differences of subjects, incompleteness of protocols, and the theoretical bias of subjects (ibid. pp. 72–78).

3.5. Merits and demerits of Popper's arguments

In his brief evaluation of Popper's dissertation, Bühler (1928b) merely noted that argument (3) against physicalism was convincing, while the discussion of the preconditions of a psychology of thinking could have profited from better use of the "representative function" of language. Indeed, several of Popper's objections to physicalism are less decisive than he believes. Objection (1) concerning the knowledge argument shifts the burden of proof to those who adhere to a certain concept of knowledge, namely one which takes only quantitative knowledge to be knowledge proper. However, one may claim that Popper's objection stands under a similar burden of proof. Thus far, his considerations merely reflect the stipulation of opposing concepts of knowledge. What about his other objections to the knowledge argument? Popper thinks that especially objections (2) and (3) show that introspection is a legitimate method in psychology. That inference is weak, even though (2) and (3) as such are plausible. Schlick (1918/1925) could argue that for psychological experiments to be possible, one must connect mental concepts to concepts of what is inter-subjectively accessible. Even when we do have an introspective access to (some) mental states and processes, such access does not suffice to safeguard knowledge-claims. For instance, when we speak of how things look to us, how far away or large they appear to us,

[17] Note that this is different from Popper's aforementioned point (Section 2.3.) that Bühler's analysis of language was incomplete, because it overlooked the function of reasoning or criticism. Also, would Popper have claimed that a physiological analysis would have to be added to the analysis of four functions? But how would a physiological analysis help to study a particular *function* of language?

[18] Oddly, ter Hark (2004, p. 125) describes this as the "second aspect of psychology" in Popper's discussion, and discusses the formations of the objective mind only afterwards (ibid. p. 126).

our claims make sense only if they are explained by a shared intersubjective framework of how things really are; and that framework is frequently one of objects in three-dimensional space. Finally, objection (4) is merely *ad hominem*, and (5) is doubtful as well, at least from our current point of view. To argue this, however, would require moving on to today's options (e.g., Davidson, 1980, ch. 11) that were unknown to Popper.

But though Popper's arguments were not all convincing, they perhaps had an effect on Bühler. After all, Logical Empiricists would soon develop new, *semantic* arguments for physicalism: psychological language can be completely translated into physical language, e.g., of publicly observable behavior, and that can secure psychology's place within the program of the unity of science (e.g., Carnap, 1932; Neurath, 1933). Obviously this strategy, if successful, would again secure the unity of psychology—albeit in a way that Bühler would dismiss. As is well-known, Carnap favored physicalism because of the problem of protocol sentences. How could the empirical basis of science be freed from the suspicion that it was merely about subjective sense data? How could it be made truly universally valid? One thing, Carnap (1932, pp. 136–142) argued, that a correct linguistic analysis of science would involve was the elimination of any linguistic expression the reference of which varies with contexts of utterance. For instance, "I hear a voice here and now" uttered by Carnap in a certain situation would have to be replaced by something like "On May 28, 1930, in Bühler's circle in Vienna, Carnap hears a voice".[19] Indexical terms like "I", "here", "now" would have no place in science. Bühler (1934, p. 36; cf. p. 104f.) found this price too high: To eliminate such "deictic" expressions would be "scientific suicide", since it would mean destroying a fundamental part of human cognitive and linguistic contact with reality. While Popper's arguments against physicalism did not go into this direction, he had argued that Bühler's earlier arguments did not work against all versions of physicalism—especially not against those developed in his neighborhood.

I return now to question (iii) left open above (2.3.): Can one extend Bühler's strategy to other domains of psychology? What about Popper's extension of the transcendental method to the domain of thinking? To begin, while he tries to model his transcendental deduction after Bühler's, there is an important disanalogy here as well. Popper (1928, p. 2f.) says that depending on the topic under study, it may be that sometimes one aspect, at other times another aspect or method will control one's research. He thinks that a "satisfactory description of the 'Mental'" is possible only through the "cooperation" (*Zusammenwirken*) of all three aspects (ibid.). However, not much follows from that in his study.[20] Bühler, in contrast, starts from an analysis of functions of language that are both necessary and systematically related. What Popper argues is only that there are fields in psychology where one needs the analysis of behavior, others where introspection is necessary, and still others where we need to study the objective products of the mind. He does not show how the three aspects are systematically related to one another; there is no unifying element in his considerations. For instance, his arguments for the necessity of studying purposive behavior in animals do not require introspection or the study of objective representations or products either.[21] Under the aspect of subjective experience, Popper does not even provide any clue about the function thinking performs here. What would have been required—and what Bühler did for the study of language—would be to reflect the nature of thinking. What makes it possible that one and the same thought performs different but related functions and can therefore be viewed from different aspects? At the same time, to make sense of this being an extension of Bühler's work, the functions identified must differ from the functions of language. One rough idea might be to say that, first, a concrete act of thinking is necessary in order to be able to produce *chains of reasoning*. We cannot draw inferences, reach well-considered decisions, and so on, unless we have—at least in principle—subjective access to the different steps in our chains of reasoning. Acts of thinking might fill the bill here. What about the appeal function of thinking? Due to the difference between language and thought, we cannot assume that it is to be found in directly inducing others to behave in certain ways—for the latter must be done by means of language or gestures. An option here might be that we use acts of thinking in order to *simulate* the appeal to another person, to anticipate her reaction to it, and so on. This can certainly be purposive for developing and carrying out plans of action. Finally, concerning the third aspect, here Popper's look at logic or science as objective formations of the mind is a good place to start. This is so because these "formations" play an obvious role in reasoning activities as considered under the first and second aspects. Note that I do not defend such an idea here. The point is merely to indicate what an extension of Bühler's strategy really requires.

4. Conclusion

While the one attempt we have examined (Popper's) to extend Bühler's approach suffered from severe problems, this approach was not doomed to failure. Bühler's concept of crisis and his Kantian approach went hand in hand: If the crisis of psychology were chronic, or revealed an ineradicable fragmentation of psychology, both the question of how psychology is possible and the transcendental method of identifying different but related methods would be superfluous. But Bühler did not believe the crisis to be chronic, and there was no principled reason to think that such a fragmentation cannot be overcome. True, Bühler did not achieve a unification of psychology as a whole—a task he never pretended to achieve, and one too demanding in any case. His integration of research on language, however, by means of a reflection about what methods have to be used in a comprehensive study of the underlying "unity" (the sign in use, the speech act) was an impressive example.

Bühler and Popper had good reason to reject the idea that psychology should start all over again from scratch—a tendency found among authors as diverse as Driesch, Vygotsky, or the Logical Empiricists. At the same time, Bühler did not deny crisis talk entirely—a reaction also found at the time (e.g. Wirth, 1927, 108f.). There is something to the perception of the crisis that one needs to deal with appropriately, by critical reflection concerning methodological and theoretical presuppositions in ongoing psychological research. The moderate Kantian approach allowed Bühler and Popper to use existing empirical claims and theories as starting points for their "transcendental deductions" of methodologies and aspects. Finally, compare their moderate notions and reactions with the dramatic crisis talk found in authors as diverse as Binet, Kostyleff, and later on in Kuhn. Bühler's concept of crisis is not

[19] Toccafondi (2004, p. 3), points to evidence showing that Carnap's well-known paper (1932) grew out of a presentation he gave in Bühler's circle on May 28, 1930, titled "Die Psychologie im Rahmen der Einheitswissenschaft" (*Psychology within the framework of unified science*).

[20] One exception concerns three problems Popper (1928, p. 77f.) lists as *desiderata* for future thought psychology: integrating association into the theory of meaningful thinking; the relation between feelings and thoughts; and the role or representation in thinking. But, pointing to an example of Bühler's, Popper merely indicates how the third of these problems requires jointly studying the expression of thought and the representation of states of affairs.

[21] And although I cannot discuss this here, neither is Popper's defense of introspection in part (III) of his deduction of methods in thought psychology convincing. It does not reflect under which conditions introspection—understood as a source of knowledge-claims—is possible. He may be right in claiming that the introspective methods advanced by Külpe, Bühler and others in the domain of thinking proved successful, and that standard worries about introspection can be overcome. But he does not provide arguments himself.

bound to the assumption that a crisis is typically solved by a revolution that replaces one paradigm by another one. Rather, different approaches can and should be integrated.

In these ways, 'crisis' can be an actor's category—contrary to Kuhn, who considered it mostly an analyst's category (see Mülberger and Sturm, this volume). Scientists who think their field is in crisis can react to the situation by rising to a meta-level; but they must also reflect what method to use at that level. Kuhn's ideas, though, have seemed almost inevitable to psychologists reflecting on the development of their discipline (Greenwood, 1999; Staats, 1983; Weimer & Palermo, 1973; Westmeyer, 1994). Given that Kuhn was hesitant to see 'crisis' as actor's category, it is not without irony that his views became influential in the self-characterization of psychologists during the "cognitive revolution" since the 1960s (e.g. Weimer & Palermo, 1973). It is not clear that this has had ever much effect on actual psychological research.

Acknowledgements

Many thanks to John Carson, Uljana Feest, Horst Gundlach, Gary Hatfield, Annette Mülberger, and to two anonymous referees for various suggestions and criticisms. I am also grateful to the Vienna University Archive, especially to Kurt Mühlberger and Edwin Glassner, and to the *Forschungsstelle und Dokumentationszentrum für österreichische Philosophie* (Graz), especially to Alfred Schramm and Ulf Hoefer, for materials from Bühler's literary estate. Finally, I was supported by the Max Planck Institute for the History of Science (Berlin), and the Spanish Ministry for Science and Innovation (Madrid), reference number FFI 2008-01559/FISO.

References

Allesch, C. (2001). Interdisziplinarität und "Einheit der Psychologie" – ein Widerspruch? *Psychologie und Geschichte, 9*, 85–104.
Allesch, C. (2003). Psychologie 2000: 75 Jahre nach der "Krise"?—Zentenarbetrachtungen am Leitfaden der "Krise der Psychologie" Karl Bühlers. In H.-P. Brauns (Ed.), *Zentenarbetrachtungen. Historische Entwicklungen in der neueren Psychologie bis zum Ende des 20. Jahrhunderts* (pp. 11–20). Frankfurt/M.: P. Lang.
Allison, H. E. (1983). *Kant's transcendental idealism*. New Haven: Yale University Press.
Allport, G. (1966). An appreciation of *Die Krise der Psychologie* by Karl Bühler. *Journal of General Psychology, 75*, 201–204.
Ash, M. (1988). Die Entwicklung des Wiener Psychologischen Instituts von 1922 bis 1938. In A. Eschbach (Ed.), *Karl Bühler's theory of language* (pp. 303–326). Philadelphia: Benjamins.
Binet, A. (1911). Qu'est-ce qu'une emotion? Qu'est-ce qu'un acte intellectuel? *L'Année Psychologique, 17*, 1–47.
Brock, A. (1994). Whatever happened to Karl Bühler? *Canadian Psychology, 35*, 319–329.
Buchenau, A. (1928). Karl Bühler, Die Krise der Psychologie (review). *Geisteskultur, 37*, 74f.
Bühler, K. (1907). Tatsachen und Probleme zu einer Psychologie der Denkvorgänge: I. Über Gedanken. *Archiv für die Gesamte Psychologie, 9*, 297–365.
Bühler, K. (1908). Tatsachen und Probleme zu einer Psychologie der Denkvorgänge: II. Über Gedankenzusammenhänge; III. Über Gedankenerinnerungen. Nachtrag: Antwort auf die von W. Wundt erhobenen Einwände gegen die Methode der Selbstbeobachtung an experimentell erzeugten Erlebnissen. *Archiv für die Gesamte Psychologie, 12*, 1–92. 93–123.
Bühler, K. (1909). Über das Sprachverständnis vom Standpunkt der Normalpsychologie aus. *Bericht über den III. Kongreß für Psychologie, Frankfurt a.M. 1908* (pp. 94–130). Leipzig:Barth.
Bühler, K. (1918). Kritische Musterungen der neueren Theorien des Satzes. *Indogermanisches Jahrbuch, 6*, 1–20.
Bühler, K. (1922). Vom Wesen der Syntax. In V. Klemperer, E. Lerch, (Eds.), *Idealistische Neuphilologie. Festschrift für Karl Vossler* (pp. 54–84). Heidelberg.
Bühler, K. (1923). Über den Begriff der sprachlichen Darstellung. *Psychologische Forschung, 3*, 282–294.
Bühler, K. (1926a). Die Krise der Psychologie. *Kant-Studien, 31*, 455–526.
Bühler, K. (1926b). *Psychologie*. Beilage: Hannoverscher Kurier. 9 November 1926.
Bühler, K. (1927). *Die Krise der Psychologie*. Jena: Gustav Fischer.
Bühler, K. (1928a). Die Symbolik der Sprache. *Kant-Studien, 33*, 405–409.
Bühler, K. (1928b). Evaluation of the Dissertation by Karl Popper. *Vienna University Archives, Rigorosenakt Karl Popper (PN 10035)*.
Bühler, K. (1931). Phonetik und Phonologie. *Travaux du Cercle Linguistique de Prague, 4*, 22–53.
Bühler, K. (1932). Das Ganze der Sprachtheorie, ihr Aufbau und ihre Teile. In G. Kafka (Ed.), *Bericht über den 12. Kongreß der Deutschen Gesellschaft für Psychologie, Hamburg 1931* (pp. 95–122). Jena: Gustav Fischer.
Bühler, K. (1933). Die Axiomatik der Sprachwissenschaften. *Kant-Studien, 38*, 19–90.
Bühler, K. (1934). *Sprachtheorie: Die Darstellungsfunktion der Sprache*. Jena: Gustav Fischer.
Bühler, K. (1935). Günther Ipsen, *Sprachphilosophie der Gegenwart*, Berlin 1930. *Kant-Studien, 40*, 333–334.
Bühler, K. (1936). Psychologie der Phoneme. In D. Jones & D. B. Foy (Eds.), *Proceedings of the Second International Conference of Phonetic Science held at University College, London 22–26 July 1935* (pp. 162–169). Cambridge: Cambridge University Press.
Bühler, K. (1966). *Crisis de la psicologia*. Madrid: Ediciones Morata.
Bühler, K. (1990). *Theory of language: The representational function of language* Transl. by D. F. Goodwin. Amsterdam & Philadelphia: John Benjamins.
Caparrós, A. (1991). Crisis de la psicología: ¿singular or plural? Aproximación a algo mas que un concepto historiográfico. *Anuario de Psicología (Facultat de Psicología, Universitat de Barcelona), 51*, 5–20.
Carl, W. (1989). *Der schweigende Kant*. Göttingen: Vandenhoek & Ruprecht.
Carnap, R. (1932). Psychologie in physikalischer Sprache. *Erkenntnis, 3*, 107–142.
Ceñal Lorente, R. (1941). *La teoria del lenguaje de Carlos Bühler*. Madrid: Bolaños y Aguilar.
Chomsky, N. (1965). *Aspects of a theory of syntax*. Cambridge: MIT Press.
Davidson, D. (1980). *Essays on actions and events*. Oxford: Clarendon Press.
Dempe, H. (1935). Die Darstellungstheorie der Sprache. Randbemerkungen zur "*Sprachtheorie*" Karl Bühlers. *Indogermanische Forschungen, 53*, 245–266.
De Saussure, F. (1916). *Cours de linguistique generale*. In C. Bally & A. Séchehaye (Eds.). Lausanne & Paris: Payot.
Driesch, H. (1925). *The crisis in psychology*. Princeton: Princeton University Press.
Du Bois-Reymond, E. 1872. Über die Grenzen des Naturerkennens. In: duBois-Reymond, Estelle. (Ed.), (1912) *Reden von Emil du Bois-Reymond in zwei Bänden* (vol. 1, pp. 441–473). Leipzig: Veit & Comp.
Eschbach, A. (1984a). *Bühler-Studien* (vol. 2). Frankfurt a.M: Suhrkamp.
Eschbach, A. (1984b). Einleitung. In A. Eschbach (Ed.). *Bühler-Studien* (vol. 1, pp. 9–24). Frankfurt a.M.: Suhrkamp.
Eschbach, A. (Ed.). (1988). *Karl Bühler's theory of language*. Philadelphia: Benjamins.
Eschbach, A. (1997). Karl Bühler und die Würzburger Schule. *Brentano-Studien, 7*, 237–254.
Friedrich, J. & Samain, D. (Eds.), (2004). *Karl Bühler: Science du langage et mémoire européenne*. (=*Histoire, Epistémologie, Langage*, 2004, Complément électronique N°2). http://htl.linguist.univ-paris-diderot.fr/num2/num2.htm.
Fritsche, C. (1981). *Untersuchung zur Krise der bürgerlichen Psychologie anhand ihrer zeitgenössischen Reflexion 1897–1945*. Phil. Diss., University of Leipzig (unpublished).
Gattei, S. (2004). Popper's philosophical breakthrough. *Philosophy of Science, 71*, 448–461.
Graumann, C. F., & Herrmann, T. (Eds.). (1984). *Karl Bühlers Axiomatik: 50 Jahre Axiomatik der Sprachwissenschaft*. Frankfurt a.M.: Klostermann.
Greenwood, J. (1999). Understanding the "Cognitive revolution" in psychology. *Journal of the History of the Behavioral Sciences, 35*, 1–22.
Hacohen, M. H. (2001). *Karl Popper—The formative years, 1902–1945*. New York: Cambridge University Press.
Heidelberger, M. (2000). Fechner und Mach zum Leib-Seele-Problem. In A. Arndt & W. Jaeschke (Eds.), *Materialismus und Spiritualismus. Philosophie und Wissenschaft* (pp. 53–67). Hamburg: Meiner.
Hildebrandt, H. (1991). *Zur Bedeutung des Begriffs der Alltagspsychologie in Theorie und Geschichte der Psychologie: Eine psychologiegeschichtliche Studie anhand der Krise der Psychologie in der Weimarer Republik*. Frankfurt a.M.: Lang.
Hofstätter, P. R. (1941). Die Krise der Psychologie. *Betrachtungen über den Standort einer Wissenschaft im Volksganzen. Deutschlands Erneuerung, 25*, 562–578.
Husserl, E. (1936/1954). *Die Krisis der europäischen Wissenschaften und die transzendentale Phänomenologie*. Published as W. Biemel (Ed.), *Husserliana VI* (pp. 1–276). Den Haag: Martinus Nijhoff. (First published 1936.)
Kamp, R. (1984). Axiomatische Leitfäden statt dogmatischer Gängelbänder. In A. Eschbach (Ed.). *Bühler-Studien* (vol. 1, pp. 40–97). Frankfurt a.M.: Suhrkamp.
Kant, I. (1998). *Kritik der reinen Vernunft*. In J. Timmernann (Ed.). Meiner: Hamburg (First published 1781; 2nd ed. 1787).
Koffka, K. (1926). Zur Krisis in der Psychologie. Bemerkungen zu einem Buch gleichen Namens von Hans Driesch. *Die Naturwissenschaften, 14*, 581–586.
Kostyleff, N. (1911). *La crise de la psychologie expérimentale*. Paris: Alcan.
Kuhn, T. S. (1962/2nd ed. 1970). *The structure of scientific revolutions*. Chicago: University of Chicago Press.
Kurz, E. (1996). Marginalizing discovery: Karl Popper's intellectual roots in psychology—or, how the study of discovery was banned from science studies. *Creativity Research Journal, 9*, 173–189.
Kusch, M. (1999). *Psychological knowledge: A social history and philosophy*. London: Routledge.
Lebzeltern, G. (1969). Karl Bühler—Leben und Werk. In K. Bühler & G. Lebzeltern (Eds.), *Die Uhren der Lebewesen und Fragments aus dem Nachlass* (pp. 7–70). Vienna: Hermann Böhlaus Nachfolger.
Lersch, P. (1953). Das Problem des Aspektes in der Psychologie. *Jahrbuch für Psychologie und Psychotherapie, 1*, 385–393.
Lewin, K. (1927). Gesetz und Experiment in der Psychologie. *Symposium, 1*, 375–421.
Maiers, W. (1988). Sechzig Jahre Krise der Psychologie. *Forum Kritische Psychologie, 21*, 23–82.

Mulligan, K. (1997). The essence of language: Wittgenstein's builders and Bühler's bricks. *Revue de Métaphysique et de Morale, 2*, 193–216.
Mülberger, A. (1994). *La aportación de Karl Marbe a la psicología*. Ph.D. thesis, Universitat Autònoma de Barcelona.
Mülberger, A. (in press). La psicología, ¿Una ciencia en crísis? Visiones divergentes entre 1897 y 1911. In A.M. Jacó-Vilela, F.T. Portugal (Eds.), *Clio-Psyché: Gênero, Psicología, História*. Rio de Janeiro: Nau.
Münch, D. (2002). Die Einheit der Psychologie und ihre anthropologischen Grundlagen. *Zeitschrift für Psychologie, 10*, 40–62.
Neurath, O. (1933). *Einheitswissenschaft und Psychologie. (=Einheitswissenschaft, Heft 1)*. Vienna: Gerold & Co.
Pléh, C. (1984). Die Sprachtheorie Karl Bühlers und die moderne Psycholinguistik. In A. Eschbach (Ed.). *Bühler-Studien* (vol. 1, pp. 282–316). Frankfurt: Suhrkamp.
Pléh, C. (1988). Two conceptions of the crisis of psychology: Vygotsky and Bühler. In A. Eschbach (Ed.), *Karl Bühler's theory of language* (pp. 407–413). Amsterdam, Netherlands: John Benjamins.
Politzer, G. (1929/1974). *Kritik der klassischen Psychologie*. Köln: Europäische Verlagsanstalt. (First published 1929).
Popper, K. R. (1928). *Zur Methodenfrage der Denkpsychologie*. Phil. Diss., University of Vienna (unpublished).
Popper, K. R. (1931). Die Gedächtnispflege unter dem Gesichtspunkt der Selbsttätigkeit. *Die Quelle, 81*, 607–619.
Popper, K. R. (1934). *Logik der Forschung*. Vienna: Julius Springer.
Popper, K. R. (1972/rev ed. 1979). *Objective knowledge: An evolutionary approach*. Oxford: Clarendon Press.
Popper, K. R. (1976). *Unended quest. An intellectual autobiography*. Glasgow: Fontana/Collins.
Reichenbach, H. (1920). *Relativitätstheorie und Erkenntnis Apriori*. Berlin: Springer (= (1965). *The theory of relativity and a priori knowledge*. Engl. transl. with an introduction by M. Reichenbach. Los Angeles: University of California Press.).
Schlick, M. (1918/2nd ed. 1925). *Allgemeine Erkenntnislehre*. Berlin: Julius Springer.
Scola, F. (1931). Karl Bühler, Die Krise der Psychologie (review). *Zeitschrift für Psychologie, 123*, 172–188.
Searle, J. (1969). *Speech acts*. New York: Cambridge University Press.
Spranger, E. (1926). Die Frage nach der Einheit der Psychologie. *Sitzungsberichte der Preussischen Akademie der Wissenschaften. Philosophisch-Historische Klasse*, 172–199.
Staats, A. W. (1983). *Psychology's crisis of disunity*. New York: Praeger.
Strawson, P. F. (1966). *The bounds of sense*. London: Routledge.
Ströker, E. (1969). Einleitung. In K. Bühler (Ed.), *Die Axiomatik der Sprachwissenschaften* (pp. 7–23). Frankfurt a.M.: Klostermann.
Sturm, T. (2006). Is there a problem with mathematical psychology in the eighteenth century? A fresh look at Kant's old argument. *Journal of the History of the Behavioral Sciences, 42*, 353–377.
ter Hark, M. (1993). Problems and psychologism. Popper as heir to Otto Selz. *Studies in the History and Philosophy of Science, 24*, 585–609.
ter Hark, M. (2003). Searching for the searchlight theory: From Karl Popper to Otto Selz. *Journal of the History of Ideas, 64*, 465–487.
ter Hark, M. (2004). *Popper, Otto Selz and the rise of evolutionary epistemology*. Cambridge: Cambridge University Press.
Toccafondi, F. (2004). Karl Bühler and neopositivism: Reasons for a non-convergence. *Histoire, Epistémologie, Langage, 2004, Complément électronique N°2*. http://htl.linguist.jussieu.fr/dosHEL.htm.
Tumarkin, A. (1921). Wie ist Psychologie als Wissenschaft möglich. *Kant-Studien, 26*, 390–402.
Vygotsky, L. (1927/1985). *The historical meaning of the crisis in psychology*. In R. W. Rieber & J. Wollock (Eds.), *The collected works of L. S. Vygotsky*, (vol. 3, pp. 233–345). New York & London: Plenum Press.
Weimer, W. B., & Palermo, D. S. (1973). Paradigms and normal science in psychology. *Science Studies, 3*, 211–244.
Wellek, A. (1958). Der Rückfall in die Methodenkrise der Psychologie als Ausdruck der Divergenz der Menschenbilder. In A. Wellek (Ed.), *Bericht über den 21. Kongress der Deutschen Gesellschaft für Psychologie in Bonn vom 23. bis 27. September 1957* (pp. 23–39). Göttingen: Hogrefe.
Wellek, A. (1959). Ein Dritteljahrhundert nach Bühlers "Krise der Psychologie". *Zeitschrift für experimentelle und angewandte Psychologie, 6*, 109–117.
Westmeyer, H. (1994). Psychologie—eine Wissenschaft in der Krise? In A. Schorr (Ed.), *Die Psychologie und die Methodenfrage* (pp. 37–53). Göttingen: Hogrefe.
Wettersten, J. R. (1985). The road through Würzburg, Vienna and Göttingen: review of Karl R. Popper. *Die beiden Grundprobleme der Erkenntnistheorie. Philosophy of the Social Sciences, 15*, 487–506.
Wettersten, J. R. (1992). *The roots of critical rationalism*. Amsterdam: Ropodi.
Willy, R. (1897). Die Krisis in der Psychologie (first and second article). *Vierteljahrschrift für wissenschaftliche Philosophie, 21*(79–96), 227–353.
Willy, R. (1899). *Die Krisis in der Psychologie*. Leipzig: Reisland.
Wirth, W. (1927). Zur Widerlegung von Behauptungen von Krisen in der modernen Psychologie. *Vierteljahrsschrift für Psychologie und Medizin, 2*, 100–131.
Wundt, W. (1907). Über Ausfrageexperimente und über die Methoden zur Psychologie des Denkens. *Psychologische Studien, 3*, 301–390.
Wundt, W. (1908). Kritische Nachlese zur Ausfragemethode. *Archiv für die gesamte Psychologie, 9*, 445–459.