Hermann Paul's *Principles of Language History* Revisited

linguae & litterae

Publications of the School of Language & Literature
Freiburg Institute for Advanced Studies

Volume 50

Hermann Paul's *Principles of Language History* Revisited

Translations and Reflections

Edited by
Peter Auer and Robert W. Murray

With contributions by
Peter Auer, David Fertig, Paul J. Hopper, and
Robert W. Murray

DE GRUYTER

ISBN 978-3-11-034747-0
e-ISBN [PDF] 978-3-11-034884-2
e-ISBN [EPUB] 978-3-11-038473-4
ISSN 1869-7054

Library of Congress Cataloging-in-Publication Data
A CIP catalog record for this book has been applied for at the Library of Congress.

Bibliographic information published by the Deutsche Nationalbibliothek
The Deutsche Nationalbibliothek lists this publication in the Deutsche Nationalbibliografie; detailed bibliographic data are available on the Internet at http://dnb.dnb.de.

Typesetting: epline, Kirchheim unter Teck
Printing: Hubert & Co. GmbH & Co. KG, Göttingen
♾ Printed on acid-free paper
Printed in Germany

www.degruyter.com

Contents

Peter Auer

Reflections on Hermann Paul As a Usage-Based Grammarian*

1 Introduction

There are two statements by Hermann Paul that have been quoted more than any others, perhaps because they are so disconcerting to the modern structuralist (or generative) linguist. One is the famous addendum to the introduction of the second edition of his *Prinzipien der Sprachgeschichte* (1886) – a book which explicitly lays out the theoretical foundations (*Prinzipienwissenschaft*) of linguistics tout court. Responding to some critical reviews of the prior editions, Paul writes regarding its title:

> It has been argued that there is a scientific approach to language other than the historical one. I reject this view. (§ 10, this volume, p. 45)

For any linguist trained in the tradition of structuralism with its taken-for-granted distinction between synchrony and diachrony as laid out, for instance, in the *Cours de linguistique générale* by Bally & Sechehaye and attributed to Saussure (cf. Saussure 1916), the confusion inherent in this apodictic statement is that Paul seems to propagate a strictly diachronic approach to language.

In the second quotation, almost as famous, Paul seems to reject all abstract categories in linguistic description and analysis:

> "Away with all abstractions" has to be our motto if we want to determine the factors involved in any real event. (§ 6, this volume, p. 37)

Again, this seems to be a statement which many modern linguists will feel highly uncomfortable about, particularly if they believe in the generative postulate that abstraction is an evaluation criterion for the quality of linguistic analysis.

* I gratefully acknowledge the support of this work by a grant from the Netherlands Institute for Advanced Study in the Humanities and Social Sciences (NIAS) in the fall of 2013. Feedback from David Fertig, Paul Hopper, and Robert Murray on a previous version proved to be highly helpful in clarifying some problematic points.

All translations are my own, except where otherwise indicated.

Both statements, however, lose their disconcerting potential when they are understood within the framework of Paul's theory of language. In fact, both refer to the same conviction which lies at the heart of Paul's thinking: Linguistics must be concerned with real language, the actual utterances produced by speakers, and the mental representations to which they are linked. I show in this reflection that Paul's approach is entirely compatible with those schools of linguistics that are subsumed today under the label of "usage-based grammar", approaches that have moved to center stage recently. The central notion here is that of "association", which through the writings of Paul and other neogrammarians became linked to the linguistic notion of "analogy", understood in a specific sense (see Fertig, this volume). In fact, although historiography often reduces the neogrammarians' contribution to linguistics to the debate around the sound laws, analogy was of equal importance to them – and judging simply from the quantity of text in the *Principles* devoted to it, it was surely of greater importance to Paul.

2 Paul's cognitive approach to language and "historical analysis"

One of the biggest innovations of the neogrammarian movement was its insistence on actual speech as the primary data of linguistic research (e. g. Sievers 1901[1876]: 6, Lehmann 1967: 262). At first sight this sounds almost contradictory, since most empirical work by Paul, Brugmann, Osthoff, Leskien, and their followers was based on examples of linguistic change post factum, usually of the type that happened a long time ago. Indeed, Paul's *Principles* hardly ever discusses an example of an ongoing change. But it is often overlooked that these completed changes were only considered the *explanandum*, while the *explanans*, according to Paul and his colleagues, could never be found in these completed changes themselves. Rather, an adequate understanding or explanation, according to their view, is only possible if the basic principles underlying language have been discovered, which in turn requires an investigation of both their physiological (phonetic) and psychological (cognitive) foundations in the *Sprachleben* ('language in its living reality'). The neogrammarians tried to lay these foundations in order to apply them to historical language change, following a new methodological rigor. This led to the establishment of phonetics as a foundational science for linguistics (Sievers' (1876) first and groundbreaking book on phonetics was not by accident entitled *Grundzüge der Lautphysiologie zur Einführung in das Studium der Lautlehre der indogermanischen Sprachen* [Fundamentals of sound physiology *as an introduction* to the phonology of the Indo-Germanic languages]). Equally, it led to the grammatical and phonetic-phonological study of the spoken

language, which at the time was equated with dialectal speech. Hence, there was an enormous output of neogrammarian studies on the dialects of the time, the so-called *Ortsgrammatiken* ('grammars of one location'), which often reached a high degree of phonetic sophistication (see Wiesinger 1976, and Murray 2010: 78–82 for discussion).

Labov's (1994: 21–24) "uniformitarian principle", according to which the properties of linguistic change have remained constant throughout history (debatable as it may be), is therefore a direct successor of the neogrammarian approach (which Labov of course was familiar with through his teacher, Uriel Weinreich, and which he explicitly acknowledges (Labov 1994: 21) in reference to Whitney 1867). It should be mentioned in passing that the neogrammarians' postulate of the "uniformitarian principle" was in turn indebted to the discussion of the same problem in 19th century geology and biology (to which Paul refers repeatedly in the Introduction).

So in an important sense, the neogrammarian movement (unlike historical-comparative grammar before them) emphasized the observation of living (spoken) language rather than the analysis of written records of dead languages. Written, historical data are not suited to derive the basic principles of language change. As Paul (§ 1, this volume, p. 31) puts it:

> On the one hand, the science of principles is thus the ultimate goal toward which all efforts of the specific historical disciplines are directed. On the other hand, the science of principles is the indispensable guide of the historical disciplines, without which they could not take a single step beyond simple givens, which are, after all, always fragmentary and wrapped up in complications that must first be untangled. Elucidating the conditions of historical emergence, in combination with general logic, provides the foundation of the methodology that must be followed in the ascertainment of every single fact. (original emphasis omitted)

A "science of principles" in Paul's usage of the word is therefore what we would today call a *theory* of language change, which on the one hand is the ultimate goal of linguistics, but on the other hand is needed in order to explain the facts deduced from written sources, without which such a theory cannot be "ascertained". What Paul sets out to do in his book is to uncover these theoretical principles. His focus in the *Principles* is on cognition, presumably since Sievers had already described the physiological conditions of language in some detail.

Against this background, it is easy to understand how Paul defines the object of linguistic analysis, i. e. the facts of language on which a linguistic theory must be based:

> The real object of investigation for the linguist consists of the entire body of speech events [*Äusserungen der Sprechtätigkeit*] in all individuals and their [i. e., the speech events'] influence on one another. (§ 12, this volume, p. 48)

This sounds like an empiricist, corpus-based approach. However, he immediately explains what he means by speech events and thereby reveals his radically cognitive orientation:

> Indeed, the history of a language includes all the sound combinations ever spoken, heard, or imagined by an individual *and the associated representations of which they were symbols*, as well as all the manifold relationships that the elements of a language entered into in the minds of individuals. (§ 12, this volume, p. 48; emphasis PA)

The acoustic event of speaking is never a linguistic fact; rather, this event needs to be seen as linked to mental representations. Since it is only in the mind of the speaker-hearer that representations of language can be processed (categorized, connected, forgotten, confused, merged, etc.), it is these mental representations and processes that are the real object of linguistic investigation. It is only here that generalizations ("principles") can be found regarding how language works and how it (thereby) changes.

This is a first sense in which Paul is anti-abstract: Linguistic data are to be found in concrete usage, not in the grammar books ("descriptive grammars", § 11, this volume, p. 47). The latter contain abstractions because they are based on the "intersection" (which he calls *Durchschnitt*, without referring to a statistical fact) of the individuals' use in a community, on what people *ordinarily* do in order to be understood (*Usus*). But such intersections are idealizations that have no reality in the mind of the individual speaker. Prevailing usage does not explain anything, simply because it is cut off from the mental processes underlying an individual's speech. Paul's dictum "Away with all abstractions!" expresses this radical form of individualism and mentalism, which moves the focus from what is done in a community, or what is written in a grammar book, toward the "linguistic mind" of the individual. Here, Paul and the neogrammarians – all similarities notwithstanding – have certainly not been a source of inspiration for modern variationists; indeed, Paul was attacked explicitly by Weinreich, Labov, & Herzog (1968) in their seminal article which laid the foundations of variationist sociolinguistics precisely for this reason. For Labov and his colleagues, "the central dogma of sociolinguistics is that the community is prior to the individual. [...] Language is seen as an abstract pattern located in the speech community and exterior to the individual. The human language faculty [...] is then viewed as the capacity to perceive, reproduce and employ this pattern" (Labov 2010: 7). For Paul (and, I presume, for most present-day usage-based grammarians) the opposite is the case; the individual is the first and foremost object of enquiry, not the community, whose "language" only results from the interaction between the individuals. This conviction was central for Paul in his lifelong fight against *Völkerpsychologie* (both in Steinthal and Lazarus' and in Wundt's version), a con-

temporary branch of linguistics that emphasized the priority of the socio-cultural over the individual.[1]

But there is a second way in which Paul uses the term "abstract" which is somewhat more difficult to grasp. Descriptive grammars are abstract not only because they represent (at best) the *Usus*, but also because they are based on the grammatical categories of traditional grammar.

> Traditional grammatical categories cannot adequately capture the grouping of the elements of language [in the mind]. Our traditional system of grammatical description is not nearly precise enough to deal with the structuration of the groups of mental representations. […] In addition, the traditional approach tempts us to inappropriately transfer what we have abstracted from one language to another. (§ 15, this volume, p. 53)

Paul is skeptical of the validity of linguistic categories for capturing the mental reality of language; for him, they need to be reconstructed in their relationship to the mental processes that are the real object of linguistic analysis. He not only criticizes the tendency to use traditional grammatical categories as a "blueprint" for the analysis of language in its living reality, but he also questions the cognitive adequacy of these categories. There is, however, a certain ambiguity in this criticism of "abstract" grammatical categories. On the one hand, Paul argues that the unconscious mental processes in the speaker must not be equated with the traditional grammarian's categories. This is clear from the following passage where he

1 More on this can be found in Knobloch (1988: ch. 3). The *Völkerpsychologen* – first Moritz Lazarus and Chajim (Heymann) Steinthal, later Wilhelm Wundt in his critical adaptation of their approach – started from the assumption that a language is the expression of a nation's *Geist* (*Volksgeist*), in a tradition that can be traced back to W. v. Humboldt as well as to G. W. F. Hegel. Paul could not see more than a metaphorical (and dangerously misleading) way of speaking in this treatment of nations as having a mind (*Geist*). For a sober, positivistic thinker like Paul, the *Volksgeist* was pure mysticism, and he fiercely attacked its proponents throughout his life. Wundt answered this critique by arguing that a language already constrains and governs the mental dispositions of the individuals speaking it to a certain degree, and that Paul was not able to capture these constraints emanating from the *Volksgeist* and manifested in language on the development of the individual mind. (Cf. Wundt (1886 1921: 31): "A language contains the general form of the representations which are alive in the *Volksgeist* as well as the laws of their combination".)

As a consequence of their insistence on the individual as the carrier of language, the neogrammarians had little to contribute to the nationalistic atmosphere towards the end of 19th and early 20th century, and the fact that they were increasingly criticized as *Lautschieber* ('sound shifters') in the scientific community can surely be explained at least in part by the changing political climate in Germany in which *Germanistik* served the political agenda of German nation building.

talks about the association between representations as one of the fundamental mental processes:

> All these associations can be formed and become active without clear conscious awareness. They must definitely not be confused with the categories that are abstracted by means of grammatical reflection, even though they usually do correspond to them. (§ 12, this volume, p. 50)

On the other hand, the distinction between grammatical categories and mental processes leads him to pair the grammatical categories with corresponding "psychological" ones, a typical feature of late 19th century psychologism in linguistics in general (cf. Knobloch 1988: 322–331). This is most prominently and successfully reflected in the distinction between psychological and grammatical subject and psychological and grammatical predicate, a distinction not invented but popularized by Paul (1920: § 87) which found its way into standard linguistic terminology as theme/rheme or topic/focus. However, the problem is much broader for Paul:

> Every grammatical category emerges on the basis of a psychological one. The former is in the beginning nothing but the transformation of the latter into an outer appearance. Once the effect of a psychological category can be recognized in the linguistic form, it becomes a grammatical one. But the creation of the grammatical category does not erase the effect of the psychological one, since the latter is independent of language. It has existed before it and will continue to exist once it has emerged. As a consequence, the harmony between the two can be disturbed in the course of time. The grammatical category is quasi a sedimentation of the psychological category. It becomes part of a tradition. Conversely, the psychological category remains free, alive, it can be formed in many and in changing ways by the individual. (1920: § 180)[2]

In chapter 15, which is introduced by this quotation, Paul discusses the psychological foundations of central grammatical categories such as gender, number, tense and *genus verbi*. For him, grammatical categories emerge on the basis of

2 Jede grammatische Kategorie erzeugt sich auf Grundlage einer psychologischen. Die erstere ist ursprünglich nichts als das Eintreten der letzteren in die äussere Erscheinung. Sobald die Wirksamkeit der psychologischen Kategorie in den sprachlichen Ausdrucksmitteln erkennbar wird, wird sie zur grammatischen. Die Schöpfung der grammatischen Kategorie hebt aber die Wirksamkeit der psychologischen nicht auf. Diese ist von der Sprache unabhängig. Wie sie vor jener da ist, wirkt sie auch nach deren Entstehen fort. Dadurch kann die anfänglich zwischen beiden bestehende Harmonie im Laufe der Zeit gestört werden. Die grammatische Kategorie ist gewissermassen eine Erstarrung der psychologischen. Sie bindet sich an eine feste Tradition. Die psychologische dagegen bleibt immer etwas Freies, lebendig Wirkendes, das sich nach individueller Auffassung mannigfach und wechselnd gestalten kann.

psychological ones, but the relationship between the two is also conflicted. Their fixed form makes the grammatical categories become part of a tradition which is not always commensurate with the psychological processes. But in order to enter into this conflict, the "abstract" grammatical categories must have a mental reality as well, i. e. they must also be part of mental grammar. The conflict here is not between the grammar books and the individual's mind, but between tradition (grammatical category) and innovation (psychological category or process) within the speaker's mind.

Having discussed Paul's notion of "abstract", let us now turn to his notion of "historical analysis". It is already clear from the quotation above (from § 12, see p. 180 above) that "historical analysis" for Paul cannot mean the comparative analysis of a sequence of (in his sense) "abstract" states of a language; in fact, this method is exactly what he criticizes under the term "historical linguistics" (see § 11, this volume, pp. 47–48). His "historical approach" is therefore not what we have come to understand as "diachronic" as opposed to "synchronic analysis" (see further Reis 1978 and Hopper, this volume). Abstract entities, as Paul points out, cannot change at all. The only objects that can change are the mental representations of language in the individual mind. Every linguistic utterance and the mental representations involved therein are historical facts. The mental representations to which an individual utterance is linked will always change, however slightly, in and through such a speech event. Language is therefore always processual and "emergent" (in the sense outlined by Hopper, this volume). Since linguistics is about concrete speech events as historical events, all analyses based on their interaction are bound to a time-line in which these events occur. A historical analysis of language is one that investigates the impact of prior speech events on later ones. Since there are no facts other than these speech events in linguistics (seen as material objects and their mental representations), there is no other way of doing linguistics than historical linguistics.

Paul's radical mentalism sounds less outrageous today than it did in times when structuralism (and generativism) reigned. Indeed, we have come to understand more and more that the notion of a "language" (or "variety"), the starting point of all structuralist analysis, cannot be treated as a given fact – it too is an "abstraction" (Paul 1910: § 22). For Paul, only idiolects exist, and even within an individual, linguistic representations are always in flux. Consequently, he repeatedly stresses the fact of variation in language and the impact of one language (even an idiolect) on another through borrowing (cf., e. g., 1920: §§ 30–31). According to Paul (1920: chapter 23), the uniformity of a language is merely the consequence of top-down standardization, an "artificial" process. He is far from understanding the ideological character of standard languages (which Voloshinov 1929 pointed out shortly after Paul's death), but he is quite explicit in

his view that the formation of standard languages is foreign to "language in its living reality" (*Sprachleben*); it is an external process of only secondary relevance for linguistics. (No doubt for this reason, the topic of standardization is deferred to the last chapter of the *Principles*.)

Radical mentalism obviously raises the question of how a language, despite all its internal variability, can come into existence and how it can change as a social fact. Weinreich et al. (1968) once claimed that Saussure (or perhaps, rather, the *Cours*) had nothing of interest to say about the sociolinguistics of language change,[3] while they considered Paul's work so central to this question that they devoted a major part of their paper to summarizing and criticizing his ideas. This sounds counterintuitive given that Saussure of the *Cours* points out that language (*langue*) is a social institution, while Paul always starts with the individual. But the contradiction is easily resolved: For structuralism (as well as the *Völkerpsychologen*), language as a social fact is simply there and needs no further explanation. It exists prior to – and largely independent of – the individual. For Paul, on the other hand, the question of how the mental representations of language in a group of speakers can change in a parallel way resulting in societal change is of prime importance. Indeed, he argues that

> the whole theory of language change can be reduced to one question: what is the relationship between prevailing usage and the speech of an individual? How is the speech of an individual determined by prevailing usage in the community, and how in turn does the individual's speech affect prevailing usage? (§ 17, this volume, p. 55; original emphasis omitted)

Paul does not have an answer, but he formulated the problem, which neither the *Völkerpsychologen* nor the Saussure of the *Cours* did.

It is useful to recall in this context that Paul rejects the term *Geisteswissenschaft* (literally translated: science of the mind) for linguistics (cf. § 4, this volume, pp. 33–34). The dichotomy *Geisteswissenschaft* vs. *Naturwissenschaft* ('natural science') was developed and made popular in Germany by Wilhelm Dilthey towards the end of the 19th century. Paul does not refer to Dilthey in any edition of the *Principles*, but it seems unlikely that he would have seen linguistics as an interpretive rather than an explanatory science, which is the main dividing line between *Geistes-* and *Naturwissenschaften* for Dilthey. The reason given in the *Principles* for the rejection of the term *Geisteswissenschaft* is, however, a different one. Paul

3 "We see no evidence that Saussure progressed beyond Paul in his ability to deal with language as a social fact; for him the precondition of dealing with language as a social phenomenon was still its complete homogeneity". (Weinreich et al. 1968: 121)

argues that language is always more than a mental object. Linguistic utterances unavoidably have physical substance. This physical substance is needed for communication: "All communication between minds is only indirect and physically mediated" (§ 7, this volume, p. 39). The linguistic event always has both a material and mental component. Such a combination of material and mental processes Paul calls *culture*. Language therefore is not a *Geisteswissenschaft* (a science of the mind, which only applies to psychology), but a *Kulturwissenschaft* (cultural science) (§ 4, this volume, pp. 33–34):

Table 1: Linguistics and related sciences according to Paul

	natural sciences (organic nature)	**cultural sciences** (mental processes)
historical sciences (evolutionary)	evolutionary biology, evolutionary geology, etc.	*linguistics*, history, etc.
experimental sciences (nomological)	physics, phonetics, etc.	psychology

Linguistics is a cultural-historical science. It is based on two nomological sciences (*Gesetzeswissenschaften*): phonetics (a natural science) and psychology (for Paul also an exact science). Among the cultural-historical sciences, linguistics is the most exact because it deals with highly repetitive historical events. Speech events (the utterance of a sound, word, etc.) are the creation of individual speakers, but they are unintentional and similar to one another to a much greater degree than in other historical-cultural sciences (such as the history of economics, the history of art, etc.): "The great uniformity of all linguistic processes in the most diverse kinds of individuals is the fundamental basis for their exact scientific analysis" (§ 9, this volume, p. 44). At the same time, every historical-cultural science also is a *social science* for Paul (§ 5, this volume, p. 34). The social character of language is due to the fact that individuals interact with each other and thereby pass on linguistic knowledge from one generation to the next. Every individual is part of this generational division of labor and cooperation (*Prinzip der Arbeitsteilung und Arbeitsvereinigung*). Individuals cannot communicate through language without being part of a society whose linguistic tradition they share, just like a society cannot function (and a language cannot exist) without the individuals who jointly construct it. Communication therefore lies at the heart of language as a social fact.

But how is it possible for individuals to understand each other (i. e. to communicate) when their mental representations are not accessible? After all, mental

representations cannot be communicated, only material linguistic products (sound sequences) that one person articulates and another person hears. The solution Paul offers is highly reminiscent of the one later developed by the sociologist and phenomenologist Alfred Schütz. Paul says:

> The content of representations itself thus cannot be transmitted. Everything which we believe we know about another individual's representations is based only on inferences drawn from our own. We start from the assumptions that the other mind has the same relationship to the outer world as our own, that the same physical impressions generate the same representations, and that these representations are interrelated in the same way. [...] The greater this correspondence, the more easily we understand each other. Conversely, every difference in this respect entails not only the possibility but indeed the inevitability of non-understanding, of incomplete understanding, or of misunderstanding. (§ 8, this volume, p. 41; original emphasis omitted)

Schütz[4] in turn argued that understanding in communication is only possible on the basis of idealizations we all take for granted in everyday life. One such idealization he calls the "congruence of systems of relevance" (which is subsumed under the more general idealization of the "reciprocity of perspectives"): EGO starts from the assumption that his perception and interpretation of the world is the same as that of ALTER, regardless of biographical differences of experience. This assumption is valid for the practical purposes of making everyday interaction possible, as long as there is no counterevidence. Both Paul and Schütz are convinced that a certain similarity of experience (due to a similar lifeworld) enhances the chances for such an idealization to be practically valid and subsequently reinforced by communicative experience.

Communicative understanding is not irrelevant to Paul, then, and neither is the emergence of language as a social fact. Up to his final text ("Mein Leben" = Paul 1922, see Introduction to this volume), Paul underlined that it was the main aim of the *Principles* to "show the relevance of the interaction between the individuals for the development of language" (Paul 1922: 497).[5] But all in all, Paul does not spend much time on communication.[6] Regarding the spread of linguistic innovations in language change, the only social factor Paul acknowledges is "intercourse"

4 Cf. Schütz & Luckmann (1975: I, 87–90), Schütz's posthumously co-authored major monograph. His ideas go back to the 1930s, and the term "reciprocity of perspectives" was already introduced by Theodor Litt in 1926.

5 Dabei suchte ich vor allem zu zeigen, welche bedeutung die wechselwirkung der individuen aufeinander für die entwicklung der sprache hat.

6 The speaker and the hearer play a certain role in the second and further editions of *Principles* in the context of the psychological subject and predicate (cf. Hopper's Reflection, this volume).

(to use Saussure's translation of German *Verkehr*). He holds the simple view that every act of communication entails some kind of convergence of the speaker's and hearer's idiolects. Language convergence and divergence in space is merely a consequence of the frequency of network contacts (*Verkehrsintensität*) (1920: ch. 2). If people communicate frequently, their language converges; if they cease to communicate (for instance because of migration), their language diverges. The whole process is automatic and unavoidable (see Bloomfield 1933: 46–47 for the same opinion). Again a direct line linking Paul to some brands of modern variationist research becomes visible (cf., e. g., Trudgill 2004 on the emergence of New Zealand English). Matters of social interpretation or identity have no place in his theory; via speech, the interactants' minds directly affect each other, unfiltered by attitudes or social evaluations of the speaker.

3 The structure of the mental grammar

The main topic of the *Principles* is not the social aspect of language, however, but the working of the individual's linguistic mind. It is here that Paul's usage-based approach becomes most obvious.[7]

The historiography of linguistics has equated the neogrammarians' linguistic theory with rule-governed phonological behavior, i. e. the *Lautgesetze*. Regular sound change has often been seen as the diachronic equivalent of generative rules, and as a consequence the entire neogrammarian movement as a predecessor of generative grammar. But even though the equation of sound laws and phonological rules is not unfounded, it must not be forgotten that the neogrammarians strictly distinguished sound change from grammatical change (as did the *Cours*, which in this and many other respects conforms to the neogrammarian doctrine). We already saw in the last section that Paul's insistence on the concrete facts of language and his skepticism against abstract notions of language (and abstract linguistic categories) does not fit into a structuralist, let alone generative frame of thinking. In this section, I outline some further aspects of Paul's usage-based approach, which are equally incompatible with generative, "rule- or constraint-based" theories.

7 There are of course many theories of language that attribute a central place to the use of language. In the following, the term "usage-based grammar theories" refers more narrowly to those approaches to language that postulate that the structure of mental representations is more or less exclusively determined by usage or, more exactly, by linguistic experience.

Modern usage-based theories (cf. Langacker 1988 for the introduction of the term, as well as, e. g., Barlow & Kemmer 2000; Bybee 2007, 2010; also cf. Diessel 2011) assume that (a) the mental representation of language is to a large degree determined by language use, (b) that mental grammar is constructed out of the linguistic input in the mind by cognitive processes that are operative in other domains of the mind as well (such as "categorization, chunking, rich memory storage, analogy and cross-modal association", Bybee 2010: 7), (c) that the strength of mental linguistic facts (their "entrenchment") is determined by frequency of usage and lack of recent input, (d) that the mental grammar of an individual consists of networks of linguistic representations that are connected in multiplex ways and in varying strength, (e) that these linguistic representations are words or larger units ("constructions") that may be stored as single units even though they may be composed of smaller ones, (f) that first language acquisition is critical for the formation of mental representations but that linguistic representations are variable and change throughout a speaker's lifetime (i. e. mental grammar is "emergent"; see Hopper 2011) and (g) that there is therefore no clear boundary between variation and change.

All these assumptions (with the possible exception of (e)[8]) are also made by Paul. The first and most important assumption for him is that every linguistic experience enters the mind and stays in the "unconscious" until it decays due to lack of further enforcement:

> [E]verything that has ever been in consciousness remains an active force in the unconscious. (§ 12, this volume, p. 48)

> [N]ot a single representation formed in the mind through speech can be lost without a trace. (§ 12, this volume, p. 49)

Experience also includes inner speech events:

> These groups of representations are a product of everything that has ever entered consciousness through listening to others, through one's own speech, and through thinking in linguistic forms. (§ 12, this volume, p. 49)

8 For Paul, sounds also have mental representations as *Lautbilder* ('sound images') and *Bewegungsbilder* ('movement images', referring to the movements of the articulators), as was generally assumed at his time (see Murray, this volume). Steinthal (1871) already used the concept of *Bewegungsvorstellungen*, with reference to Müller (1835). The same distinction is found, e. g., in Wernicke's work on aphasia (1874 [1977: 93, 98]), called "sensory memory image" and "motor memory image" in the English translation), from where it entered anatomically-based conceptions of speech which Paul, however, appears never to have been interested in.

The strength of linguistic representations in the mind and the strength of the relations between them are permanently changing in the individual, since they are either reinforced by further experiences ("outside impression") or by inner speech ("re-introduction into consciousness"), or they decay (§ 13, this volume, p. 50). Therefore, the frequency with which a linguistic event occurs affects its mental representation (see §§ 77–79, this volume, pp. 87–90). In particular, irregular representations are adapted to more frequent patterns:

> Everything [...] that lacks the support of a group or benefits from it only to a small extent will not be robust enough to withstand the power of the larger groups unless it becomes especially intensely imprinted in memory through frequent repetition. (§ 79, this volume, p. 90)

One of the examples Paul gives are double object constructions with two accusative case markings in German, which only occur with very few verbs (hence, lacking "the support of a group") and tend to be replaced by the much more usual ditransitive constructions with a dative and an accusative object. Thus, the exceptional construction of the verb *lehren* with two accusative objects (*sie lehrt den Schüler* [ACC] *die lateinische Sprache* [ACC] 'she teaches the student the Latin language') is more and more construed according to the dominant pattern, i. e. with a dative and an accusative, as in *sie lehrt dem Schüler* [DAT] *die lateinische Sprache* [ACC]) (cf. § 79, this volume, p. 90). Infrequent construction types can only survive if one or more of their instantiations are used very often.[9]

In the mind, the representations that enter it on the basis of experience are reorganized and combined into "richer" groupings, i. e. the mind dynamically processes experience (1920: § 12, this volume, pp. 48–50). The connections between the representations in the mind form "groups" based on "association" or "attraction" (Paul uses both terms). Although he does not speak of a "network" to describe these groupings, it is clear that they are not set-theoretical entities for him but have an internal structure which we would describe using this term today. These networks between representations are the "mental grammar" of an individual (in Paul's terminology, a "system of linguistic representations" – *Organismus von Vorstellungsgruppen*[10]).

The network idea is applied by Paul (1920: § 12, this volume, pp. 48–50) to both the internal structure of words as sequences of sounds and to the links between words. A word is first of all an association of a number of representa-

9 Paul points out that phonological similarity will favor the absorption of one group by another. The same argument was already presented in Paul (1877/1879: 17).

10 In the terminology of the 19th century, the term *Organismus* is not necessarily a biological metaphor, but often simply means "structure".

tions of sounds (acoustic images) with representations of articulatory movements (*Bewegungsvorstellungen*), that is, a series of sound images and corresponding kinesthetic sensations ordered in a sequence. Translated into modern terminology, the mental association network corresponding to the word *cat* would therefore be (an individual version of) the following (with phonetic signs representing the sound images, curled brackets for movement representations and lines indicating associations of varying strength):

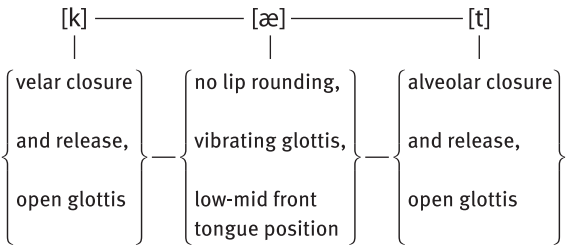

Figure 1: The mental network of acoustic images and articulatory movements in the word English *cat* according to Paul's theory

This grouping has been acquired through a multitude of experiences with this word and the sounds of which it is composed. Using /k æ t/ as shorthand, not for structuralist phonemes but for the coupled auditory and articulatory representations as shown above, this sequence of sound representations is associated with representations of meanings:

Figure 2: The coupling of auditory/articulatory representations and a meaning representation in the word English *cat* according to Paul's theory

I have deliberately used this way of illustrating Paul's word-internal association complex in order to make it clear how it differs from Saussure's idea of the linguistic sign. (The word "sign" does not appear as a technical term in Paul's *Principles*.) The main difference is on the semantic side, where Paul does not distinguish between "form" and "substance" (in Saussure's terminology, i. e. conceptual and denotational meaning). On the sound side, the mental representations are not abstract, but concrete entities in the mind of a speaker, learned and reinforced by communication with others.

The association of sound and meaning representations in morphologically simple words is of little concern to Paul, however. He is more interested in the associations of words into larger groupings/networks. If we take *cat* now as shorthand for the total complex of representations that constitute this word, we can explicate how Paul describes a linguistic network of associations, taking into account their sound shape, morphology, syntax, and (referential) meaning (§§ 75–76, this volume, pp. 83–87).

Paul first distinguishes between *formal (morphological)* and *material (substance-related)* groupings.[11] Formal means that the members of the group belong to some kind of morphological category (such as nominative, comparative, diminutive, etc.), material means that the members of the group belong to the same paradigm (i. e., all forms of the word "cat"), i. e. they are connected by lexical meaning.[12] The whole morphology of a language is in this way broken down into groupings of representations (the nominative plural by umlaut, or 1st person present tense of one verb class, etc.). Words can also be connected in a weaker way on the basis of their semantics alone, like *cat* and *dog* are connected by the fact that they both denote animals, without showing any morphological similarity. Material (semantic) groups may additionally be connected by phonological similarity (which usually reflects etymological relatedness, cf. *cat – kitten*). But frequently these phonological similarities only apply to pairs of individual words and are not supported by a larger grouping (cf. *cat – tomcat*, *cat – kitten*). Formal groups can also be supported by phonological similarity, but in the Indo-European languages this is rare due to syncretism (and nominal/verbal classes); for instance, the forms of the German plural are one formal group, but the different morphological ways to mark plural are not related phonologically.

As an example for the kind of network structure that results from the various groupings of representations, consider the words *rats, cats, caps*. They are related to each other by the fact that they are all marked for plural, and the final /s/-suffix also establishes a phonological similarity. In addition, the plural and singular forms *rat ~ rats, cat ~ cats, cap ~ caps* are related pairwise on the basis of their material (semantic) similarity. (Of course, they also enter into a purely sound-related grouping on the basis of being single-syllable words containing an /ae/-

11 Paul never makes explicit what he means by *stofflich* (substance-related, translated as 'material' in the text). The usage of the term in Steinthal (see below) clearly suggests a semantic/denotational reading. Saussure's (or the *Cours*') distinction between form and substance is obviously indebted to Paul (and Steinthal?), but gives a more precise, semiotically based reading to both terms.

12 Grammatical morphemes do not seem to have a material side for Paul, i. e. there is nothing like "plurality" which would connect all morphological plural forms.

vowel in the syllable nucleus. *Rats* and *cats* further share the same final group of consonants, while *caps* and *cats* share the same initial consonant. But these purely phonological groupings are of little relevance for Paul.)

If we try to combine the types of groupings mentioned so far into a network of representations, we arrive at the following (with the fat lines establishing the primary formal and material dimension, the thin lines additional phonological groupings):

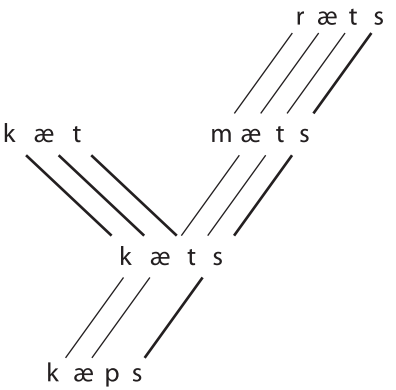

Figure 3: Networks of mental representations according to Paul's theory

This figure is taken from Bybee (1995), who uses it to describe the emergence of word morphology (here, the plural) from lexical connections in the mind. It corresponds exactly to Paul's description of the groupings of formal and material representations.[13]

In the complex whole of associative groupings that constitutes a morphologically simple word such as *cat*, we encountered sequential and simultaneous associations. The first are responsible for the structure of the word as a sequence of sounds, whereas the second are responsible for the link between sound representations and the movement representations, as well as the link between sound and meaning. The first are activated sequentially in time, the second are activated simultaneously. On the level of grammar, two dimensions of associations can be distinguished as well, but they have a slightly different status. Words enter into associations with others that frequently co-occur with them in a sequence;

13 Although Bybee and Paul share a network-based approach to linguistic representations in the mind, it is only fair to state that Bybee explicitly rejects Paul's notion of analogy (cf. Bybee & Moder 1983).

these *syntactic groupings* are of utmost relevance for Paul and he frequently refers to them in the "empirical" parts of his book (particularly when he talks about fusions of sequences of words into new words, see 1920: ch. 12, i. e., univerbation). On the other hand, words enter into associations with all other words along the dimensions of the association networks that are based on similarity of form and/or meaning. The difference between these two dimensions of word-related associations is that the syntactic ones are "already presented to the mind from the outside" (§ 76, this volume, p. 87), as they are heard as co-occurring in a sequence; their relationship is based on contiguity in time and they are experienced as a contiguous event. Non-syntactic groupings of words based on association are purely a product of the mind; they are based on similarity.[14] Again using the terminology of modern usage-based approaches, we may paraphrase Paul as arguing that the transition probabilities between words lead to their fusion such that the distinction between words and sequences of words becomes blurred.

The true force of Paul's extension of associative groupings to those based on contiguity only becomes visible, however, if we consider Paul's notion of *analogy*, which is derived from his theory of representational groupings as the basis of mental grammar (cf. Fertig, this volume for an in-depth treatment).

4 Paul's notion of analogy

Speaking is not reproducing patterns from memory. It was a fundamental error of earlier linguistics, Paul argues, to treat all speech, as long as it did not deviate from established usage, as merely reproductive (§ 78, this volume, p. 88; see Hopper, this volume).[15] This dynamic, "generative" approach to grammar,[16] for which Paul explicitly claims to stand in the tradition of Humboldt's *energeia*, is based on his notion of analogy. First outlined in Paul (1877/1879), his notion of analogy differs radically from the one used before him in historical linguistics (where it was often equated with "false analogy") and has remained one of the dominant conceptions of analogy to the present day. In accordance with his refusal to accept anything but historical linguistics (in the sense outlined above),

14 The obvious link to Saussure is discussed in section 5, below.

15 Also cf. Percival (1973) who points out that Paul's notion of creativity, particularly in syntax, is directed against the common opinion held by earlier linguists in Germany (most famously, August Schleicher) that contemporary languages are in a state of (morphological) decay and have left their "creative" phase a long time ago. For Paul, who in this respect follows Humboldt, every living language is creative since speaking is always based on "analogy".

16 Chomsky (1964: 51) also refers to Paul's § 78 (this volume, p. 88).

analogy for Paul is a fundamental operation of the linguistic mind, which under certain circumstances can lead to lasting changes in the linguistic usage of a community, but is first and foremost the basis of all non-reproductive language use: "Everybody who speaks continuously creates analogies" (Paul 1877 [1879: 12].)

As already pointed out, mental representations for Paul are not just simple traces of experience, but are cognitively processed and structured into network-like constellations. One outcome of this processing are simple association networks as discussed in the last section, but in addition the mind produces even more complex, secondary cognitive structures which Paul calls proportional groupings (*Proportionsgruppen*) (§ 76, this volume, pp. 84–87). A proportional grouping emerges in the mind once the members of a group are frequent enough to lead to the extraction of a pattern. They can be represented in the format of proportional equations such as

(1) *cat* : *cats* = *rat* : *rats* = *cap* : *caps* etc.

The higher the number of simple groups that enter into a proportional relationship, the stronger it is. An isolated grouping such as

(2) *cat* : *tomcat*

cannot establish a proportional equation. (A *tomcow* would be a possible, but unlikely formation, since the equation *cat : tomcat = cow* : ? is only backed by one grouping.) Just like simple groupings, proportional groupings can be based on morphological form or on substance (semantics) or both, and they can be supported by phonological similarity.[17]

The generative potential of proportional groups resides in their openness for new formations never encountered by the speaker before. Thus, the proportional grouping

(3) *wish : wishes = brush : brushes = blush : blushes …*

leads a competent speaker who has never heard the (nonsense) word *blash* to process it in the framework of the existing proportional equation

(4) *wish : wishes = brush : brushes = blush : blushes … blash* = ?

17 Some inconsistencies in Paul's examples for this case have been pointed out by Hermann (1931: 73–80).

and to resolve this equation by ? = *blashes*. This is no different from the equation

(5) *wish : wishes = brush : brushes = blush : blushes = fish* : ?

and it is only the knowledge of how other speakers in the community form the plural of *fish* (i. e. prevailing usage) that will keep a speaker from resolving this proportional equation by the "false analogy" *fishes*.[18] The less entrenched the irregular plural form is in memory (i. e., the less often it has been encountered), the more likely it is that a speaker resolves the equation in such a way. Infrequent irregular forms therefore tend to be regularized more than frequent ones. But the cognitive process that is used to produce a "correct" form (as in the case of *blashes*) is no different from the process that results in a "false" form such as *fishes*. The only difference is the social obstacles that are in the way of such an analogical change, i. e. it lies outside cognition. This is the reason why Paul rejects the distinction between "true" and "false" analogy (Paul 1877 [1879]). There is no clear border between regular morphological production and innovation, rather: "Through the operation of the groups, every individual has the possibility and the impetus to go substantially beyond that which is already established in the language" (§ 81, this volume, p. 92).

It follows from the same assumptions that children use analogy much more than adults to create novel forms not part of prevailing usage (§ 82, this volume, p. 93). Their language production is not based on different cognitive principles from that of adults, but simply less controlled by prevailing usage; children have been exposed to much fewer linguistic forms than adults, and their linguistic experiences are much narrower.[19] They must therefore rely on analogy more than adults who can produce many, also irregular forms from memory. But once again, the difference is not categorical: "[I]t is unlikely that one could identify a certain point in an individual's life at which it could be said that language acquisition is complete" (§ 18, this volume, p. 56).

One of the most important and innovative aspects of Paul's theory is the extension of the idea of proportional groupings to *syntax*. The groupings between words based on contiguity are due to the fact that they are experienced as occurring together. For instance, the mental representations of noun phrases such

18 Of course this example only holds in a context in which prevailing usage has the plural *fish* (not in non-standard varieties of English or historical stages of the language in which the plural receives an overt marker).

19 This only holds for language that is not controlled by norm-setting authorities, as in the case of "artificial" standard languages (Paul 1920: ch. 23).

as *clever cats, hungry rats, blue caps* can be combined to form the proportional equation

(6) *clever : cats = hungry : rats = blue : caps ...*

which by analogy can lead to the resolution of

(7) *spoiled :* ?

by the word ? = *brats*. The underlying pattern of Adj + N is thus extracted from experience in order to be used as a "generative" device for the production of further nouns with a preposed adjectival modifier:

> In natural first-language acquisition, the rule as such is not given, but rather merely a number of model sentences. Over time, we hear a number of sentences that are constructed in the same way and that therefore band together into a group. While the memory of the specific content of the individual sentences may fade more and more, the common element is reinforced again and again through repetition, and thus the rule is abstracted unconsciously from the model sentences. Precisely because no rule is explicitly given, a single model sentence is not sufficient, but rather a group of models, the specific content of which seems irrelevant. (§ 79, this volume, p. 89)

In sum, the structure of a language for Paul is that of a network of representations in the mind into which all words are embedded by association ties based on contiguity or similarity:

> There is hardly a word in any language that stands completely outside of the groups described here. There are always other words, similar in one respect or another, with which a word can associate itself. But there are important differences in the multiplexity of the connections that a word participates in and in the intimacy of the bond. (§ 77, this volume, pp. 87–88)

The criticism often raised against the neogrammarians, i. e. that they failed to develop a notion of the linguistic system and viewed the facts of language as a set of unrelated single phenomena, seems hardly justified against this background. However, it is true that the system of a language sketched by Paul is not the structuralists' system. It has a connectionist structure in which the individual elements are held together in very different ways, and with different strengths. Groupings in absentia are based on similarity (which can also include antonymy or contrast, cf. his examples *thick/thin* or *man/woman*, cf. § 75, this volume, p. 83), but not on negative oppositions, as in structuralism.

5 Association and mental grammar – Paul's predecessors and followers

So far I have taken the liberty licensed by the term "reflection" to draw parallels between Paul's cognitive theory of language and modern usage-based approaches without contextualizing Paul's approach historically. In this section some remarks are added regarding the claim made in the beginning of this Reflection that Paul's linguistic theory is grounded in early 19th century mentalism but transformed in such a way that it set the stage for empirical psycholinguistic research on language and language processing (which in turn can be said to have had an impact on modern cognitive theories of language).[20] In order to do so, a short look at his predecessors and the reception of his *Principles* is necessary. I largely restrict myself to the discussion of the central term in Paul's cognitive, usage-based theory, which is that of "association", a notion that underwent considerable change of meaning during Paul's lifetime. Associations are at the heart of Paul's grammatical thinking, and particularly his notion of analogy (which he also calls "association of forms", cf. Paul 1879).[21]

When Paul started to publish in the 1870s, the dominant paradigm of thinking about the mind had been set by Herbart and Steinthal, both of whom Paul repeatedly refers to in the *Principles*. He clearly considered himself a Herbartian. The relationship with Steinthal was more ambivalent, as Steinthal was also a leading proponent of *Völkerpsychologie*, which, as outlined above, Paul strongly felt to be incompatible with his own approach. Upon closer inspection, however, Paul is much more indebted to Steinthal (in particular Steinthal 1871) than to Herbart.

Johann Friedrich Herbart (1776–1841) was one of the central figures of early German psychology in the early 19th century. According to his own ambition and in the eyes of his followers, he was the founder of a nomological science of the mind (*Seelenkunde*) based on mechanistic principles of a type hitherto restricted to the natural sciences.[22] Much of Paul's terminology comes from Herbart, begin-

20 An overview of linguistic and psychological research on association and analogy until the middle of the 20th century can be found in Esper (1973). Esper shows how neogrammarian thinking directly inspired early experimental work in psychology on association.

21 De Mauro's view (1967[1972: 469]), according to which it was psychoanalysis (Jung) which introduced association into psychological research, is simply wrong.

22 See Levelt (2013) and Knobloch (1988: 467–482) for overviews. A concise summary of Herbart's psychology from a non-linguistic perspective can be found in Dorer (1932: 73–103). The indebtedness to Herbart was not restricted to Hermann Paul but shared by other Neogrammarians as well. Delbrück, for instance, gives a detailed discussion of the Herbart–Steinthal–Paul

ning with the term *Vorstellung* ('representation'[23]), the basic unit of the mind. Herbart in turn was inspired by English empiricism, but gave their notion of association an idealistic and at the same time mechanistic turn (cf. Herbart 1816, 1824). His idea of the mind is that of a structured and self-structuring entity that is similar to an algorithm. Representations within the mind combine, merge, enforce, and inhibit each other as a function of their strength. If a representation fails to reach a certain threshold, it falls out of consciousness, but still remains in the unconscious.

Representations combine into sequences (*Vorstellungsreihen*). For this to be possible, the process of association is essential, which is of an asymmetric nature: "Association [for Herbart] is the process by which one idea [representation] gains energy by being bound to other active ideas" (Levelt 2013: 44). Representations that share certain features become coupled. Representations that do not share features reject each other (repulsion). A new sensual impression cannot enter the mind unless it is fused with an already existent representation. This is the basis of abstraction. At a higher level, "masses of representations" (*Vorstellungsmassen*), another term frequently used by Paul, absorb new information ("apperception").

In his later works, Chajim Steinthal tried to combine Herbart's theories with Humboldt's tradition. After his stay in Paris (1852–1856), where he had met Auguste Comtes, he turned to psychology (and away from logic) as the foundational science for linguistics (cf. Steinthal 1855) and was therefore unavoidably attracted to Herbartianism. Bringing Herbart's mechanistic *Seelenkunde* together with the more dynamic approach to language Humboldt had advocated was a difficult task; some (for instance Wundt) thought that Steinthal failed in it. Nevertheless, Steinthal's *Einleitung in die Psychologie und Sprachwissenschaft* (1871) is likely to have been the single most important inspiration for Hermann Paul. The impact Steinthal had on Paul includes the former's conviction that at an abstract level, the elements in the physical and in the mental world are governed by similar processes – in particular, the process of "attraction", i. e. "in the most general sense the tendency of material things just as of mental factors to establish relations and links, which means the tendency to combine for the formation of more complex forms, while at the same time keeping their own identity" (1871:

tradition in his 1901 book *Grundfragen der Sprachforschung*, in which he discusses its main differences vis-a-vis the emerging school of Wilhelm Wundt and his language psychology.

23 The term is sometimes translated as 'idea', but since we tend to think of ideas having a propositional content, this term seems too narrow. For instance, sound and movement representations can hardly be conceived as ideas.

115).[24] Steinthal explicitly draws a parallel between mental representations and atoms in this context (1871: 116). Steinthal sharpened Herbart's views by introducing the notion of the "narrowness of the consciousness" (*Enge des Bewusstseins*): At any given moment, the mind can only process one representation. Bringing a representation to consciousness requires an extra "energy of the mind" (Steinthal 1871: 132). This means, for instance, that in a sentence, which corresponds to a sequence (*Reihe*) of representations linked to each other by syntax, only one word can be conscious at a time. But the representations that are momentarily unconscious are linked to this conscious one (1871: 166), and this leads to an indirect activation Steinthal calls resonance (*Schwingen*): "We call representations, which have an effect, which apperceive, without being conscious, resonating representations" (1871: 237).[25] These resonances are, among many others things, also important for sentence processing since, due to the narrowness of consciousness, the speaker cannot consciously control the sentence beginning when he or she ends a sentence, and vice versa.[26] Hence, without resonating mental representations, no sentence processing would be possible. Starting from this view of the conscious (narrowness) and the unconscious (resonance), Steinthal gives the following definition of associations:

> Under the Law of *Association* of representations we understand the following transfer, or conduct, or movement of the mind: the bringing-to-conscious of mental elements which are not triggered by a sensual stimulation *a* or by the very same contents, but which are *co-triggered* by the link of representations *c′* with elements *b′* which have become conscious by the sensually given same content *b*. [...] The representations hence form sequences by association, each of them being a link in a chain. Only one link is conscious directly; the other links follow in the same way, each of them bringing the next one into consciousness,

24 [I]n allgemeinster Bezeichnung das Streben der materiellen Dinge wie der psychischen Faktoren, mit einander in Verhältniss und Verbindung zu treten; also das Streben, indem sie in ihrem Sein beharren, sich doch an einander zu schließen zur Bildung umfassenderer Gestalten.

25 Vorstellungen nun, welche ohne bewusst zu sein, dennoch wirken, appercipiren, nennen wir *schwingende* Vorstellungen.

26 It seems that Paul did not pick up this idea in his syntactic associations. The idea of resonating unconscious representations in the mind was vital for the development of psychological association theory and its application to psychotherapy as a way of accessing the unconscious through association experiments. The use of associations as a means to access the unconscious for therapeutic reasons was first suggested by Freud in his association-based *Redekur* (therapy by talk) (cf. Freud & Breuer 1895). The separation of the mind and the consciousness is therefore not an invention of Freud, let alone Saussure, as suggested in Jäger (2012), but can be traced back at least to Steinthal.

> and each of them repelling the previous one from consciousness, or rather: each of them handing over the privilege of consciousness to the next. (1871: 140)[27]

Association is a way of indirectly bringing elements of the mind into consciousness; it is therefore linked to memory. If memory and sensual impression diverge, the first may win over the second; such a misperception Steinthal calls *Unterschiebung*.[28]

Steinthal in many ways presents a more detailed and reflective account of the working of associations in the mind than Paul, including an in-depth discussion of language acquisition and aphasia. He develops the idea that the strength of an association between two representations varies with the frequency of the link (1871: 160) and formulates various laws regarding the strength of associations (1871: 161). Paul clearly left this kind of basic psychological research to Steinthal, whom he obviously considered to be a psychologist more than a linguist. When it comes to language, however, he goes considerably beyond Steinthal. One example is indeed his treatment of form-related associations (see above, p. 191), which is central to Paul's theory since it allows him to formulate his concept of analogy. Groupings of representations based exclusively on form are acknowledged by Steinthal and even linked to analogy, but he calls them "puzzling" [*rätselhaft*] (p. 246) and confesses that he has little to say about them. His main topic is material (semantic) associations. Yet, "[w]e have to acknowledge that when a child has learned to understand a sentence, he or she has not only grasped the contents (*Stoff*) consciously, but its form will also resonate. […] [I]n this way, those wonderful groupings come into existence which do not have a content-based effect, and which have content only to serve as a carrier for their resonanting form […]" (1871: 246–247).[29] For Paul, however, these groupings were not at all puzzling, but rather the basis of all grammar.

---

27 Solches Bewusstwerden seelischer Elemente, welches weder unmittelbar durch den sinnlichen Reiz (a) oder auch nur durch den ganz gleichen Inhalt […], sondern welches nur durch die Verbindung der Vorstellungen (c′) mit solchen Elementen (b′), welche durch den sinnlich gegebenen gleichen Inhalt (b) bewusst worden sind, mit *veranlasst* wird, […] solche eigentliche Übertragung oder Leitung, Fortbewegung der Bewusstheit, versteht man unter dem Gesetze der *Association* der Vorstellungen. […] Die Vorstellungen bilden also durch Association Reihen, in denen jede das Glied einer Kette ausmacht. Nur ein Glied wird unmittelbar bewusst, so folgen die andern Glieder der Kette, jedes das folgende in das Bewusstsein hebend, und jedes das vorangegangene aus dem Bewusstsein stoßend, oder genauer: jede den Vorzug der Bewusstheit an die andere abgebend.

28 The term is used by Paul as well (see § 19, this volume, p. 56), but in a different sense which we translated as 'displacement'.

29 Es muss eben anerkannt werden, dass, wenn ein in einen Satz verstehn gelernt hat, es nicht

Having discussed Paul's predecessors, let us now turn to his impact on linguistics and psycholinguistics. Here, Saussure comes to mind immediately.[30] As shown in the last section, Paul assumes that associations between linguistic representations can be based on similarity or contiguity. Saussure's distinction between *rapports associatifs* (later termed "paradigmatic" by Hjelmslev) and *rapports syntagmatiques* looks like an obvious copy, since it builds on the same contrast. However, Saussure (1967–1974: D266, 279) restricts the term "association" to the first ("outside speech: the association, which is created in the mind between the words that have something in common"[31]): Only the paradigmatic associations take place in the mind, while the syntagmatic relationships originate in context (Saussure 1967–1974: D282, 2000).[32]

Among the associations by similarity, the *Cours* distinguishes, like Paul, between association-based groupings according to grammatical form (stem or suffix), meaning, and phonological similarity:

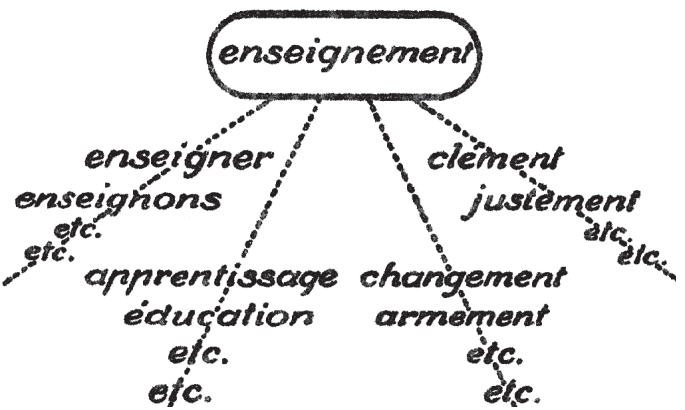

Figure 4: Saussure's (1916[1974: 175]) network of associations

nur den Stoff desselben mit Bewusstheit erfassst, sondern dass auch seine Form schwingend wird. […] So entstehen diese wunderbaren Gruppen, die nach ihre Stoffe gar nicht wirken, und die einen solchen nur haben um daran einen Träger zu besitzen für die schwingende Form […].

30 Saussure owned a copy of *Prinzipien* (cf. Koerner 2008: note 30). In addition, it is entirely unlikely that he would have been unfamiliar with the most authoritative neogrammarian book, which by the turn of the century had become a "standard textbook" (Reis 1978: 167; see also the Introduction to this volume), even though this indebtedness is hardly acknowledged in his notes or in the published text of the *Cours*. The biographical reasons are well known (see Jäger 2010).

31 Hors de la parole, association qui se fait dans la mémoire entre les mots offrant quelque chose de commun.

32 I am indebted to Ludwig Jäger for drawing my attention to these quotations from the Notes.

Figure 4 shows a network of associations around the word *enseignement* 'teaching' based on meaning (*enseignement – apprentissage – éducation*), identity of stem (*enseignement – enseigner – enseignons*), identity of suffix (*enseignement – changement – armement*), and purely phonological similarity (*enseignement – clément – justement*). According to De Mauro (1974: 468), the example is from Saussure, while the figure is added by the "editors" of the *Cours*.

But taking a closer look, not only is Saussure's syntagmatic axis different from Paul's, the same applies to Saussure's paradigmatic axis. Although Saussure sometimes speaks of similarity (as in the above quote), for him the paradigmatic relationships are primarily defined by negation; they are built on oppositions between the element in question and all the others in the system. Their basis of paradigmaticity is difference. Saussure (2002[2006: 46]) calls this the "principle of the negativity of signs or meanings": "Form implies difference from other forms and nothing else" (Saussure 2002[2006: 29]). But negativity is an abstract relationship between signs which is hard to locate in the mind of the language user.[33] The structuralist notion of paradigmatic oppositions, although terminologically indebted to the tradition of association psychology, is in fact rather distant from it. Paul's understanding of association, on the contrary, is that of 19th century psychology. Only on this basis could his theory be of such interest to experimental psychologists in the beginning of the twentieth century, and the prediction of language change on the basis of "proportional groups" a testable hypothesis, while a similar uptake of Saussure's work among experimental psychologists is not known. Saussure and structuralism led away from the strong cognitive orientation of linguistics in the neogrammarian paradigm. It dissolves the close relationship which is so typical of the late 19th century.

In the last quarter of the 19th century, psychology developed from the earlier, mainly introspective discipline of the mind (as, for instance, advocated by Steinthal) to an empirical science based on observational data collected in experiments. For this new psychology, the neogrammarian notion of analogy was an important source of inspiration, starting perhaps with Thumb & Marbe's[34] seminal 1901 monograph *Experimentelle Untersuchungen über die psychologischen Grundlagen der sprachlichen Analogiebildung*. The authors tried to show by experimental methods that Paul's proportional groups – and hence analogical change in language – are based on strongly entrenched associations. Their famous "law", according to which reaction time logarithmically correlates with

33 Cf. again Jäger (2012: 47) on the role of association in Saussure's semiotics.

34 Marbe studied linguistics in Freiburg with Hermann Paul before he left linguistics for psychology.

frequency of response (i. e. the association), is interpreted as a proof for Paul's hypothesis that infrequent words are more prone to analogical adaptation than frequent ones (Thumb & Marbe 1901: 83). Thumb's research was continued by his student Paul Menzerath (1908, 1909).

There is also an interesting and little acknowledged link between the neogrammarian, associationist language theory (as worked out by Paul in the *Principles*) and Freud's early writings. Marshall (1974) and Buckingham (2006) go as far as claiming that Sigmund Freud was "the first neogrammarian neurolinguist" (Marshall 1974: 359). There can be no doubt that *Studien über Hysterie* (Breuer & Freud 1895) and *Zur Auffassung der Aphasien* (1891) are full of terminology and assumptions that are part of the associationist legacy (among them, the notions of *Vorstellungsmechanik* 'mechanics of representation', *Unbewusstes* 'unconcious', and *Verschiebung "längs gewisser assoziativer Kategorien"* 'displacement alongside certain associative categories'; see the detailed account in Dorer 1932). Freud's "~~speech~~ therapy" (*Redetherapie*), with which he experimented at the time, was entirely based on associations. However, despite this interest in language and the associationist theory of the mind, the only explicit reference to a linguist's work by Freud is not to Hermann Paul but to Berthold Delbrück, who, unlike Paul, was highly interested in clinical neurology. In 1886, Delbrück published a lecture to the *Medicinisch-Naturwissenschaftliche Gesellschaft zu Jena* on the topic of "Amnestische Aphasie", which Freud refers to (Freud 1891: 22–23). Delbrück set out to apply the "fundamentals of modern linguistic analysis" as laid out in the "excellent book" by Hermann Paul (i. e. the first edition of the *Principles*) to what he had read about aphasia and observed in aphasic patients. He argued that both the accessibility of a word for an aphasic patient and the paraphasias s/he will perhaps produce when accessing and uttering it can be explained by the strength of the associative groupings of representations, be they formal or semantic. Delbrück also mentions in passing contaminations (his example is *Vutter* from *Vater* and *Mutter*) and insists that they are not due to mispronunciation but to a "mixing of mental images". Freud takes up both issues; the issue of contamination foreshadows his later interest in slips of the tongue.[35]

35 Freud's book had the general aim of establishing a view of aphasia based on pathways and not on localization. Regarding aphasic symptoms as a disturbance of associations was of course highly compatible with this view. In addition to his explicit reference to Delbrück, he comes back to the issue of strength of association as a predictor of aphasic speech in later passages of his book (Freud 1891: 75). Here, he reformulates Delbrück's thesis (Freud 1891: 90, without explicit reference) as follows: "Furthermore, it is worth noticing that representations of words that are associated with each other in groups are better retained than single ones, and that words are the better retained the more extensive their associations are". [Es ist ferner bemerkenswert, daß

The link between association and linguistic analogy was only lost in the 1920s and 1930s, due to the dwindling importance of the neogrammarian school. Psychologists of course continued to work on associations by ever more refined experimental methods. But symptomatically, overview articles of the time – such as Prandtl's chapter on *Assoziationspsychologie* in Saupe's *Handbook* (1927) – no longer mention linguistics. Associations are grouped on the two axes of contiguity and similarity, but no specific link to language is made.

6 Conclusion

Hermann Paul is surprisingly modern today. His views are easily compatible with those of modern cognitive grammar, particularly with usage-based approaches to language and its representation in the mind. It is evident that the neogrammarians' heritage is not restricted to their particular way of approaching sound change which translates quite easily into (and is a historical precedent of) modern variationist theories, particularly the Labovian quantitative approach to sound change. The neogrammarians, with Paul as their most successful and influential protagonist, had a second story to tell: that of analogy as the fundamental "generative" principle of language use (which they equated with language change), and that of association as the basic cognitive principle behind it. I have tried to reconstruct in the context of his time Paul's concept of analogy that is based on the cognitive processing of experience. Although this concept bears some resemblance to (and surely must have influenced) Saussure's *liens associatifs*, Saussure's transference of association from the psychological into the semiotic domain (in the sense of the structuralist "paradigmatic" relations) ended a fruitful phase of cooperation between linguistics and psychology as it emerged in the second half of the 19th century. Hence, rereading Paul also means rediscovering this phase in the history of linguistics which sounds more compatible with modern approaches to language today than it did 50 years ago.

References

Barlow, Michael & Suzanne Kemmer (eds.) (2000) *Usage-based models of language*. Stanford: Center for the Study of Language and Information.

Bloomfield, Leonard (1933) *Language*. New York: Holt, Rinehart and Winston.

Wortvorstellungen, die *zu Reihen assoziiert* sind, besser erhalten werden als einzelne und daß Worte desto leichter erhalten bleiben, je *weitläufiger* ihre Assoziationen sind.]

Breuer, Josef & Sigmund Freud (1895) *Studien zur Hysterie.* Leipzig & Wien: Deuticke.
Buckingham, Hugh W. (2006) Was Sigmund Freud the first neogrammarian neurolinguist? *Aphasiology* 20, 1085–1104.
Bybee, Joan (1995) Regular morphology and the lexicon. *Language and Cognitive Processes* 10: 425–455.
Bybee, Joan (2007) *Frequency of use and the organization of language*. Oxford: Oxford University Press.
Bybee, Joan (2010) *Language, usage, and cognition*. Cambridge: Cambridge University Press.
Bybee, Joan & Carol Lynn Moder (1983) Morphological classes as natural categories. *Language* 59: 251–270.
Chomsky, Noam (1964) *Current issues in linguistic theory.* The Hague: Mouton.
Delbrück, Berthold (1886) Amnestische Aphasie. *Jena'sche Zeitschrift für Naturwissenschaften, Supplement II* (Sitzungsberichte, Sitzung vom 7. Mai 1886), 91–98.
Delbrück, Berthold (1901) *Grundfragen der Sprachforschung mit Rücksicht auf W. Wundts Sprachpsychologie erörtert.* Strasbourg: Karl J. Trübner.
Diessel, Holger (2011) Review article of *Language, usage, and cognition* by Joan Bybee. *Language* 87, 830–844.
Dorer, Maria (1932) *Historische Grundlagen der Psychoanalyse*. Leipzig: Felix Meiner.
Esper, Erwin E. (1973) *Analogy and association in linguistics and psychology.* Athens: University of Georgia Press.
Freud, Sigmund (1891) *Zur Auffassung der Aphasien. Eine kritische Studie.* Leipzig & Wien: Deuticke.
Herbart, Johann Friedrich (1816) *Lehrbuch zur Psychologie*. Königsberg: Bornträger.
Herbart, Johann Friedrich (1824–1825) *Psychologie als Wissenschaft.* Königsberg: Bornträger.
Hermann, Eduard (1931) *Lautgesetz und Analogie* (*Abhandlungen der Gesellschaft der Wissenschaften zu Göttingen, Philologisch-Historische Klasse*, neue Folge 23, 3). Berlin: Weidmann'sche Buchhandlung.
Hopper, Paul J. (2011) Emergent grammar (2). In: James Paul Gee & Michael Handford (eds.), *The Routledge handbook of discourse analysis,* 301–314. London: Routledge.
Jäger, Ludwig (2010) *Ferdinand de Saussure zur Einführung*. Hamburg: Junius.
Jäger, Ludwig (2012) Der assoziative Sprachapparat. Anmerkungen zu Saussure und Freud. *Sprache und Literatur* 43(1): 36–51.
Koerner, E. F. Konrad (2008) Hermann Paul and general linguistic theory. *Language Sciences* 30(1): 102–132.
Knobloch, Clemens (1988) *Geschichte der psychologischen Sprachauffassung in Deutschland von 1850 bis 1920*. Tübingen: Max Niemeyer.
Labov, William (1994) *Principles of linguistic change*, vol. 1: *Internal factors*. Oxford: Blackwell.
Labov, William (2010) *Principles of linguistic change*, vol. 3: *Cognitive and cultural factors.* Hoboken: John Wiley.
Langacker, Ronald W. (1988) A usage-based model. In: Brydida Rudzka-Ostyn (ed.), *Topics in cognitive linguistics*, 127–161. Amsterdam: John Benjamins.
Lehmann, Winfred (ed.) (1967) *A reader in nineteenth-century historical Indo-European linguistics*. Bloomington: Indiana University. [http://www.utexas.edu/cola/centers/lrc/books/readT.html]
Litt, Theodor (1926) *Individuum und Gemeinschaft. Grundlegung der Kulturphilosophie.* 3rd edn. Leipzig & Berlin: B. G. Teubner.

Levelt, Willem J. M. (2013) *A history of psycholinguistics: the pre-Chomskyan era*. Oxford: Oxford University Press.

Marshall, J. C. (1974) Freud's psychology of language. In: R. Wollheim (ed.), *Freud: A collection of critical essays*, 349–365. New York: Anchor.

Mauro, Tullio de (1967[1972]) Editor's notes, in Saussure (1972).

Menzerath, Paul (1908) Die Bedeutung der sprachlichen Geläufigkeit oder der formalen sprachlichen Beziehung für die Reproduktion, *Zeitschrift f*ür *Psychologie* 48: 1–95.

Menzerath, Paul (1909) Psychologische Untersuchungen über die sprachliche Kontamination. *Zeitschrift f*ür *angewandte Psychologie* 2: 280–290.

Müller, Johannes (1835) *Handbuch der Physiologie des Menschen*. (2nd edn.) Koblenz: Hölscher.

Murray, Robert W. (2010) Language and space. The neogrammarian tradition. In: Peter Auer & Jürgen Erich Schmidt, *Language and space. An international handbook of linguistic variation*, 70–87. Berlin: Mouton de Gruyter.

Paul, Hermann (1877[1879]) Zur geschichte des germanischen vocalismus. *Beiträge zur Geschichte der deutschen Sprache und Literatur* 6: 1–256. [Also published as the first chapter in *Untersuchungen über den germanischen Vokalismus*. Halle: Max Niemeyer, 1879.]

Paul, Hermann (1910) Über Völkerpsychologie. *Süddeutsche Monatshefte* 2: 363–373.

Paul, Hermann (1922) Mein Leben, *PBB* (= *Pauls und Braunes Beiträge zur Geschichte der deutschen Sprache*) 46: 495–500.

Percival, W. Keith (1973) Methodological principles. An introduction to the new edition of "The study of the history of language". Preface to the reprint of: H. A. Strong, W. S. Logeman, & B. I. Wheeler, *Introduction to the study of the history of language*. New York: AMS Press.

Prandtl, Antonin (1927) Assoziationspsychologie. In: Emil Saupe (ed.), *Einführung in die neuere Psychologie* (= Handbücher der neueren Erziehungswissenschaft, vol. 3), 84–99. Osterwieck am Harz: Zickfeldt.

Reis, Marga (1978) Hermann Paul. *Beiträge zur Geschichte der deutschen Sprache* 100(2): 159–204.

Saussure, Ferdinand de (1972[1916]) *Cours de linguistique générale*, publié par Charles Bally et Albert Sechehaye avec la collaboration de Albert Riedlinger; édition critique préparé par Tullio de Mauro. Paris: Payot. (First published 1967 in Rome by Laterza.)

Saussure, Ferdinand de (1967–1972[1916]) *Cours de linguistique générale. Édition critique* par Rudolf Engler. 2 vols. Wiesbaden: Harrassowitz.

Saussure, Ferdinand de (2006[2002]) *Ecrits de linguistique générale*, ed. by Simon Bouquet, Rudolf Engler, & Antoinette Weil. Paris: Gallimard. [English translation: *Writings in general linguistics*. Oxford, 2006: Oxford University Press.]

Schuchardt, Hugo (1885) *Über die Lautgesetze: Gegen die Junggrammatiker*. Berlin: Robert Oppenheim. [Reprint in Vennemann & Wilbur 1972, 1–38; English translation 41–72.]

Schütz, Alfred & Thomas Luckmann (1975) *Strukturen der Lebenswelt*. Neuwied & Darmstadt: Luchterhand.

Sievers, Eduard (1876[1901]) *Grundzüge der Lautphysiologie [Phonetik] zur Einführung in das Studium der Lautlehre der indogermanischen Sprachen*. Leipzig: Breitkopf & Härtel. [2nd edn., 1881; 3rd edn., 1885; 4th edn., 1893.]

Steinthal, Chaijim (also: Heymann) (1855) *Grammatik, Logik und Psychologie, ihre Principien und ihr Verhältniß zu einander*. Berlin: F. Dümmler.

Steinthal, Chaijim (also: Heymann) (1871) *Einleitung in die Psychologie und Sprachwissenschaft*. Berlin: F. Dümmler.

Thumb, Albert & Karl Marbe (1901) *Experimentelle Untersuchungen über die psychologischen Grundlagen der sprachlichen Analogiebildung*. Leipzig: Wilhelm Engelmann [Reprint 1978, with an introduction by D. J. Muttay. Amsterdam: John Benjamins).

Trudgill, Peter (2004) *New-dialect formation: The inevitability of colonial Englishes*. Edinburgh: Edinburgh University Press.

Vennemann, Theo & Terence Wilbur (eds.) (1972) *Schuchardt, the neogrammarians, and the transformational theory of phonological change.* Frankfurt a. M.: Athenäum.

Voloshinov, Valentin (1929) *Marksizm i filosofia jazyka*. Leningrad: Akademia Nauk. [English translation: *Marxism and the philosophy of language.* 5th edn., 1993. Cambridge, MA: Harvard University Press.]

Wiesinger, Peter (1976) Die Wiener dialektologische Schule. In: *Festgabe für Otto Höfler,* ed. by Helmut Birkhan, 661–703. Vienna: Braumüller

Wernicke, Carl (1874) *Der aphasische Symptomencomplex: Eine psychologische Studie auf anatomischer Basis*. Breslau: Cohn & Weigert. [Reprinted in: *Gesammelte Aufsätze und kritische Referate zur Pathologie des Nervensystems*, Berlin: Fischer, 1893, 1–10.] [English translation in: G. H. Eggert (ed.), 1977 *Wernicke's works on aphasia*. = *Early sources in aphasia and related disorders*, vol. I. The Hague: Mouton, 91–145.]

Weinreich, Uriel, William Labov, & Marvin Herzog (1968) Empirical foundations for a theory of language change. In: Winfred P. Lehmann & Yakov Malkiel (eds.), *Directions for historical linguistics*, 95–198. Austin: University of Texas Press.

Whitney, William Dwight (1867) *Language and the study of language*. New York: Charles Scribner & Co.

Wundt, Wilhelm (1886 [1921]) Ziele und Wege der Völkerpsychologie. In: *Probleme der Völkerpsychologie.* 2nd edn., 1–37. Stuttgart: Kröner. [Earlier version published as: Über Ziele und Wege der Völkerpsychologie, *Philosophische Studien* 4: 1–27.]

Wundt, Wilhelm (1901) Besprechung von Thumb & Marbe 1901. *Anzeiger f*ür *indogermanische Sprach- und Altertumskunde* (*Beiblatt zu den Indogermanischen Forschungen*) 12: 17–20.

David Fertig

Two Conceptions of Analogical Innovation/Change*

1 Introduction

At least since neogrammarian times, there have been two fundamentally different understandings of the process of analogical innovation in morphology and morphophonology, which I will refer to here as lexical-replacive vs. assimilatory. According to the lexical-replacive conception, analogical innovation involves the wholesale substitution of one (set of) wordform(s) for another, such that the only connection between the old and new forms is the fact that they express the same meaning/function. Under an assimilatory conception, by contrast, analogy is a matter of forms influencing related forms; the innovative forms are thus regarded as altered continuations of the corresponding older forms (Wundt 1904; Hermann 1931: 81–82), with any replacement occurring at the level of individual sounds within the affected form(s). Paul is more unequivocal than any other linguist before or since in his insistence on a lexical-replacive and his rejection of any assimilatory understanding of analogy. In this Reflection I explore the reasons for and the implications of Paul's uncompromising stance on this issue.

An important secondary theme of this contribution is the relationship between the model of productive grammar that Paul lays out in chapter 5 of the *Principles* and calls "analogy" and his extensive and detailed account in subsequent chapters of what has come to be called "analogical change", a term that Paul himself never uses. Because of the widespread and long-standing practice of using the term "analogy" to refer to a type of change, many linguists today look to chapter 5 assuming, from the title, that it contains Paul's account of analogical change. The few who read on discover that most of what Paul has to say about the role of analogy in morphological and morphophonological change is contained in chapters 10–13 (see Reis 1978).

* I am grateful for funding from the Freiburg Institute of Advanced Studies (FRIAS) that allowed me to attend FRIAS colloquia on the topic of this volume in 2012 and 2013. Comments from and discussions with Robert Murray, Peter Auer, Paul Hopper, Orrin Robinson, Jeannette Marsh, and Garry Davis on earlier versions of this Reflection and related presentations have been tremendously helpful.

All translations are my own, except where otherwise indicated.

Under a replacive conception, overt analogical innovations are commonly understood as products of speakers' normal, productive use of their mental grammars. In Saussure's terms, "analogy [...] is entirely grammatical and synchronic" [l'analogie [...] est toute entière grammaticale et synchronique] (1995[1916]: 227–228; see also Bloomfield 1933: 275–276, 405–406). Using one of several distinctions that he adopts from Steinthal (1860: 142; more on Steinthal in Auer, this volume), Paul argues that analogical innovation crucially involves "production" – in the sense of speakers using their mental grammars to create forms that they may have never before encountered – as opposed to "reproduction" of forms stored in memory. Productive grammar use is a matter of solving for unknowns, of guessing at forms for which a speaker cannot rely on any stored representation; analogical innovation amounts to guessing wrong. Paul models this creative process with proportional equations in which the terms must be whole word-forms, reflecting his strictly word-based view of the morphological component of the mental grammar, but it can also, at least in many cases, be modeled with operations on abstract underlying stems (Osthoff 1879b: 142) or rules that concatenate morphemes (Jespersen 1887: 194), and Paul acknowledges that certain replacive morphological innovations actually require one or the other of these alternative devices (§ 83, this volume, pp. 94–95). Besides Paul, prominent advocates of a more or less exclusively replacive conception of analogy include Saussure (1995[1916]) and Bloomfield (1933).

Opponents of a replacive conception often explicitly characterize analogical innovation as a process akin to assimilation. The affinity with phonological assimilation is most apparent in cases where the affecting and affected forms frequently co-occur within an utterance. Schuchardt (1885: 7) and Hermann (1931: 76–77, 86) regard syntagmatic relations between co-occurring forms as an important supporting factor in much analogical change. Hermann, for instance, attributes the shift of the Latin noun *senatus* 'senate' from the 4th declension to the 2nd partly to its frequent co-occurrence with the original 2nd-declension noun *populus* 'people', as in the formulation *senatus populusque romanus* 'the Roman senate and people'.

Where the relevant forms rarely or never co-occur in an utterance, many scholars see what amounts to "paradigmatic assimilation" at work (Andersen 1980: 16–17). These assimilatory forces are generally regarded as extra-grammatical, perhaps involving the same kinds of factors – mishearing, slips of the tongue, intentional deviation from prevailing norms – that Paul sees at work in contamination and folk etymology (see sections 4 and 5 below), although it has recently become more common to try to incorporate paradigmatic assimilatory forces into the grammar itself, especially in Optimality Theory (McCarthy 2005). Scholars who – implicitly or explicitly – define analogical innovation/change primarily in

assimilatory terms include Schuchardt (1885), Wheeler (1887), Hermann (1931), Vennemann (1972a), and most unequivocally Wundt (1904; see also Delbrück 1901: 109–111). We find a pre-neogrammarian statement of the assimilatory conception in Curtius (1860: 331, quoted in Wheeler 1887: 40):

> Above all, the entirety of language in its living reality is pervaded by the force of analogy. Language has a feeling for the affiliation of related forms; every one of these affects the others, and they show an unmistakable striving to make each other similar, even identical, to level out small differences resulting from individual conditions.[1]

For a much more recent example, consider Joseph's (1998: 362) characterization of analogy "in a broad sense" as "any change due to the influence of one form on another".

For several decades now, the mainstream view has granted an important status to lexical-replacive developments while adopting a broader definition of analogical change that also includes various undeniably assimilatory processes, now usually included under the heading "non-proportional analogy" – a phrase that would be an oxymoron for Paul and his closest followers. Important early proponents of this view include Jespersen (1887: 190–196) and Oertel (1901).

Keep in mind that the contrast between lexical-replacive and assimilatory conceptions concerns the *process* – or what some might call the *mechanism* – of analogical innovation. No one would dispute that the *effects* of analogical change are generally assimilatory in the sense that they result in semantically/functionally related expressions becoming more similar in their phonetic and/or morphological make-up. What, if any, role do these assimilatory effects play in the motivation of analogical change? They could be entirely epiphenomenal, "a gratuitous by-product of the basic process" (Vennemann 1972a: 144), but many scholars, including Paul and others (e. g. Hock 1991: 167) who conceive of the process largely or entirely in replacive terms, regard the assimilatory effects as somehow reflecting the *function* of analogical change. Brugmann (1876: 317–318, note 33) waxes poetic on this topic, quoting Schiller's *Lied von der Glocke*:

> If one wants to apply value judgements to the forces that condition the ongoing development of language – which is certainly permissible – one could rightly [...] portray the operation of false analogy as something highly beneficial for language and claim that only

1 Vor allem durchdringt das ganze Sprachleben die Macht der Analogie. Die Sprache hat ein Gefühl für die Zusammengehörigkeit der verwandten Formen; eine jede von diesen wirkt auf die andere ein, und es giebt ein unverkennbares Streben sie einander ähnlich, ja gleich zu machen, kleine aus den individuellen Bedingungen hervorgegangene Verschiedenheiten auszugleichen.

> this force – as "the beneficent heavenly daughter who freely and easily and joyfully binds that which is alike" – has brought out the true harmony in the structure of language.[2]

Paul (1920: § 155) expresses similar views repeatedly in chapters 10 and 11 of the *Principles*, e. g.: "Every language is constantly busy eliminating all useless deviations from uniformity, creating the same phonetic expression for that which is functionally the same".[3] The neogrammarians' insistence on these beneficial effects are a reaction to the prevailing earlier attitude towards analogy as "something pathological and degenerative in the development of a language" [etwas Krankhaftes und Degenerierendes in der Entwicklung einer Sprache] (Brugmann 1876: 317, note 33).

The assimilatory conception of the process of analogical innovation is closely tied to an assumption that there must be a straightforward connection between the function of change and the motivation for individual innovations, or as Anttila (1985: 7) puts it, that "final causes seek out efficient causes" (see also Vennemann 1972a: 144–6). Paul, by contrast, sees the relationship between functional considerations and individual historical developments in Darwinian terms: Initial innovations are – like biological mutations – largely random with respect to functionality, but functionality plays an important role in determining which new forms and structures survive and which do not (chapter 1, § 16, this volume, p. 54). For phonetic change, Paul invokes the Darwinian principle in accounting for individual developments (see § 47, this volume, pp. 78–80), but when it comes to analogical change he is more inclined to apply the notion of (un)fitness for survival to entire morphological systems. In an early statement, he relates this specifically to memory burden:

> So-called false analogy is not only a necessary consequence of this disruption of the harmony but also, at the same time, a reaction against it, by means of which the memory is freed from the crushing burden of the mass of peculiarities that have imposed themselves on it. Due to the seemingly arbitrary randomness of this burden, the memory is no longer capable of dealing with it. (Paul 1877: 328)[4]

---

2 Will man an die Kräfte, die die Fortentwicklung der Sprachen bedingen, im Hinblick auf ihre Wirkungen den Massstab des Wertes legen, was ja immerhin erlaubt ist, so könnte man mit […] Rechte […] das Wirken der falschen Analogie als etwas für die Sprachen höchst förderliches hinstellen und behaupten, diese Kraft habe als "die segenreiche Himmelstochter, die das Gleiche frei und leicht und freudig bindet", erst die wahre Harmonie im Sprachbau hervorgebracht.

3 Jede Sprache ist unaufhörlich damit beschäftigt alle unnützen Ungleichmässigkeiten zu beseitigen, für das funktionell Gleiche auch den gleichen lautlichen Ausdruck zu schaffen.

4 Die sogenannte falsche analogie ist nun nicht bloss eine notwendige folge dieser störung der harmonie, sondern zugleich eine reaction dagegen, wodurch das gedächtnis von der sich

In chapter 10 of the *Principles*, Paul (1920: § 138) elaborates on this notion that a hypothetical morphological system deprived of the salutary effects of analogical change would be unfit for survival, although he drops the explicit mention of memory burden:

> It is hard to imagine the degree of disconnectedness, confusion, and incomprehensibility that language would gradually reach if it were obliged to patiently endure the devastations of phonetic change, if no reaction against this were possible. But a means for such a reaction is available in analogical formation. With its help, language gradually works its way back, again and again, to a more tolerable situation, to firmer connectedness and more functional groupings in inflection and word formation. (original emphasis omitted)[5]

2 Replacive vs. assimilatory accounts of paradigm leveling

The differences between the two conceptions of analogical innovation are clearest and perhaps most important in the case of paradigm leveling, which can be attributed either to the (assimilatory) influence of one or more forms on other forms in the same paradigm, or to the creation of new form(s) based on the non-alternating pattern found in items not subject to the alternation in question (Hill 2007; Garrett 2008). Take the elimination of the [z]~[r] alternation in English *freeze–frozen* from Old English *frēosan–froren*, for example. An assimilatory account would maintain that the forms with *s* (= [z]) exerted an influence on those with *r*, effecting a replacement of *r* by *z* at the segmental level but leaving the rest of an older form such as *froren* unchanged. Advocates of a lexical-replacive approach would instead maintain that the innovators came up with the new form *frozen* on the basis of non-alternating models such as *bēodan–boden* 'offer' and that the similarities between earlier *froren* and innovative *frozen* are essentially coincidental.

Some linguists see a fundamental distinction between paradigm leveling, which they regard as (largely) assimilatory, and the interparadigmatic extension

---

ihm aufdrängenden erdrückenden last einer menge von absonderlichkeiten befreit wird, die es wegen ihrer scheinbar willkürlichen regellosigkeit nicht mehr zu beherschen vermag.

5 Man kann sich schwer eine Vorstellung davon machen, bis zu welchem Grade der Zusammenhangslosigkeit, Verworrenheit und Unverständlichkeit die Sprache allmählich gelangen würde, wenn sie alle Verheerungen des Lautwandels geduldig ertragen müsste, wenn keine Reaktion dagegen möglich wäre. Ein Mittel zu solcher Reaktion ist nun aber in der Analogiebildung gegeben. Mit Hilfe derselben arbeitet sich die Sprache allmählich immer wieder zu angemesseneren Verhältnissen durch, zu festerem Zusammenhalt und zweckmässiger Gruppierung in Flexion und Wortbildung.

of affixes and alternations, which they consider replacive. Early neogrammarians who emphasized the distinction between "material" and "formal leveling" (*stoffliche* vs. *formale Ausgleichung*) sometimes saw things this way (Brugmann 1876: 318–319, note 33; Paul 1879: 7; Osthoff 1879a: 25, 1879b: 143), and the corresponding contrast between "leveling" and "extension" has in recent decades become a mainstay of textbook accounts of analogical change (e. g. Anttila 1989: 104; McMahon 1994: 70–4; Haspelmath & Sims 2010: 127).

The earliest neogrammarian discussions of analogical change often characterize the process in terms that are more assimilatory than lexical-replacive or that are vague enough to be compatible with either conception (see Davies 1978), as when Brugmann (1876: 318, note 33) writes that analogical innovations "come about because the speaking individual has – at the moment when he wants to speak – a different formation in mind (association), in view of which the new formation is then implemented".[6] In his first major theoretical discussion of analogy, Paul (1877) is already starting to think in more clearly lexical-replacive terms. Proportional equations, which Paul may have adopted from Havet (1875), make their first appearance in the first edition (1880) of the *Principles*. In subsequent editions, Paul is increasingly emphatic about defining analogy in strictly proportional/replacive terms. His categorical rejection of any assimilatory conception of paradigm leveling is most explicit in a footnote that first appears in the fourth edition (1909; see § 82, note 4, this volume, pp. 93–94), but he already makes his position quite clear in a paragraph that he adds to chapter 10 of the second edition:

> Where an unnecessary and useless difference has arisen through phonetic change, it can be eliminated with the help of analogy, specifically through the gradual replacement of the form that became differentiated in this way by a new formation that does not contain the difference in question. We can call this process leveling (*Ausgleichung*), but we must be clear in our own minds that the true essence of the process is not captured by this expression, that it consists rather of a complicated series of individual processes, which were analyzed in chapter 5. (1886a: 161[1920: § 138]; original emphasis omitted)[7]

6 Sie kommen dadurch zu Stande, dass dem redenden Individuum im Moment des Aussprechenwollens eine andere Formation im Sinne liegt (Association), im Hinblick auf die nun die Neubildung sich vollzieht.

7 Wo durch den Lautwandel eine unnötige und unzweckmässige Differenz entstanden ist, da kann dieselbe mit Hilfe der Analogie beseitigt werden, indem nämlich eine so differenzierte Form allmählich durch eine Neubildung verdrängt wird, welche die betreffende Differenz nicht enthält. Wir können diesen Prozess als Ausgleichung bezeichnen, nur müssen wir uns klar darüber sein, dass mit diesem Ausdruck nicht das eigentliche Wesen des Vorgangs bezeichnet ist, dass derselbe sich vielmehr aus einer komplizierten Reihe von Einzelvorgängen zusammensetzt,