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Multiple languages, memory, and regression: an examination of Ribot's Law

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Abstract

Background: In his major work on diseases of memory, Théodule Ribot (1881) offered an explanation of the selective recovery patterns observed in some bilingual aphasics. His theory has been continuously cited in the aphasia literature over the past 125 years in as one explanation for the relative sparing of an aphasic person's first language.

Aims: This paper examines the history of ideas regarding language and memory with respect to understanding bilingual aphasia.

Main Contribution: A significant distinction drawn by Ribot between disorders in monolingual and multilingual speakers appears to have been lost. Monolingual aphasic cases were discussed by Ribot under the classification of “partial amnesia.” In contrast, impairments in language with respect to those who had learned multiple languages were classified as “exaltations of memory, or hypermnesias.” Examination of Ribot’s writings reveals a conceptual approach to memory, learning, and aging which is distinct from that assumed today. This paper will critically examine these ideas and analyse the sources of Ribot’s conceptualization by placing his work in its historical context, and tracing the antecedents of his theories through the authors he cited.

Conclusions: This review of the writings of Ribot, and those of his predecessors, highlights the fact that conceptual distinctions held in the 19th century led to research questions that were conceived of in a wholly different light from the present day. It throws into relief the strong distinctions currently assumed to exist between learning languages and learning other information, between first language acquisition and adult second language learning, and between lexical and syntactic knowledge. This investigation into the history of ideas suggests ways to further develop our current approach to account for the multitude of patterns observed in bilingual aphasia.

This paper examines the history of ideas regarding memory, regression, and aging in bilingual speakers. The notion that “senescence itself is an illness” has a long tradition (Schafer, 2002). The common link between increasing difficulty with memory and aging was generally accepted as the natural course of events throughout the history of western culture up to the Enlightenment. In the 19th century, the increasing medicalization of mental processes brought about novel conceptualizations of memory and language function. The focus of the majority of this work was linked to efforts to localize mental functions in areas of the brain; this was specifically concerned with the faculty of language and acquired difficulties resulting in aphasia (Harrington, 1987). The key work of Théodule Ribot (1839-1916) who synthesized his contemporaries’ work with respect to memory is of particular relevance to issues regarding the psychological organization of multiple languages. His original contribution was to offer an explanation of bilingual aphasia as representing a specific memory impairment.

The short passage contained in Théodule Ribot’s book on *Diseases of Memory (Les maladies de la mémoire*, 1881; English Translation, 1882) on the language abilities of second language learners in later life form the foundation of our modern understanding of the neurolinguistics of bilingualism (e.g., Critchely, 1974; Paradis, 1977; Albert and Obler, 1978; Fabbro, 1999). Detailed consideration of Ribot’s original thesis provides a new perspective on current research on bilingual speakers that is predicated on a different set of theoretical assumptions (e.g., Paradis, 2000; Fabbro, 2001).

Ribot's book presents a detailed investigation of memory impairments of various sorts, and offers a number of axiomatic principles derived from the pathological cases to explain the workings of memory in general. The 'law of regression', which is nowadays referred to as Ribot's Law, predicts the gradient of forgetting from the most recent to the oldest memories (e.g., Hodges and Graham, 1998). Ribot's Law has been formatively applied to a variety of phenomena in neuropsychology in the past century notably influencing Freud (1915) and Jakobson (1962) to name only two (Spreeen, 1968). However, within the world of bilingualism, Ribot's name has been associated closely with attempts to explain the selective recovery of languages in multilingual speakers with language disorders (Lambert and Fillenbaum, 1959; Albert and Obler, 1978).

Although his book has been cited frequently and continuously in the aphasia literature over the past 125 years, a significant distinction that Ribot drew between disorders in monolingual and multilingual speakers appears to have been lost. Impairments in language that he classified as aphasia are discussed under the classification of "partial amnesia." However, impairments in language with respect to those who had learned multiple languages were classified as "exaltations of memory, or hypermnesias." [The Oxford English Dictionary (1989) gives as the fifth non-material meaning for 'exaltation' as an augmentation in degree or intensity. It cites a mid-nineteenth century source for this meaning: Alexander Bain's *The Senses and the Intellect* (1855, p.177) as an example of this usage: "The skin is therefore marked by a great exaltation of the common sensibility of the body."]

Examination of Ribot's writings reveals a conceptual approach to memory, learning, and aging which is distinct from that assumed today. This paper will critically

examine these ideas and analyse the sources of Ribot's conceptualization by placing his work in its historical context, and tracing the antecedents of his theories through the authors he cited.

Théodule-Armand Ribot (1839-1916)

Ribot is considered to be the founding father of French Psychology (Nicolas and Murray, 1999). He was trained in both Philosophy and Medicine, having a particular interest in psychiatric patients and the empirical investigation of the relations between pathology of mind and brain. Ribot was a founding editor of the first psychology journal in France--*Revue philosophique de la France et de l'étranger* in 1876, which still in publication today. In addition, he authored a large number of influential psychology texts. His work on diseases of memory (1881) is the one upon which his reputation was founded. Today it is considered a significant source of theoretical development in late 19th century French neuropsychology.

An Original Synthesis on Memory

Unlike earlier authors such as John Locke (1689) and David Hartley (1749), Ribot wished to explain memory in empirical rather than metaphysical terms. In the preface, Ribot clearly states his objective:

“My purpose in this work is to provide a psychological monograph upon the diseases of memory, and ...to derive from them certain deductions. The phenomena of memory have often been investigated, but never from a pathological standpoint.”

Ribot's general thesis was based on the notion that the acquisition of memories, and subsequent defects of those memories, followed general principles of the theory of

association. Ribot was a strong proponent of the 'English School of Psychology' and was well known for his text in French on *La psychologie anglaise contemporaine (école expérimentale)* (1870) which discussed the work of David Hartley (1705-1757), J. S. Mill (1806-1873), Alexander Bain (1811-1877), Herbert Spencer (1820-1903) and George Henry Lewes (1817-1878). His ideas about language were also strongly influenced by the ideas of Immanuel Kant (1724-1804). Ribot cited the work of the English philosopher David Hartley as the foundation for his model of memory structure and function

Specifically, Ribot linked the Theory of Association in memory to what he termed the 'Law of Regression'. Ribot stated that the dissolution of memory followed a consistent and predictable pattern: "In cases of general dissolution of the memory, loss of recollections follows an invariable path: recent events, ideas in general, feelings and acts." (1882:203) However, Ribot spent much of his book discussing the "partial dissolution" [i.e. selective impairments] of memory, arguing that memory is not a unitary function but comprised of independent memories, "each form being clearly established by morbid cases." (1882:203) In the classical tradition, memory was considered to be a monolithic function. Ribot's innovation was to clearly argue that there are different types of memory (i.e., currently termed semantic, episodic, procedural, etc.) which can show dissociations in pathology.

This notion that psychological principles can be deduced from pathological observations was a significant contribution by Ribot to the development of the neuropsychological method of clinico-pathological correlation. (Nicolas, 1998)

Ribot was original in arguing that "...diseases of memory must be studied by themselves, as morbid psychological states, through which we better understand the same elements in a healthy condition." (1882: 70).

Memory in First and Second Language Acquisition

With respect to partial disturbances of memory, Ribot focused on the loss of lexical items in acquired language disorders. He considered names to be 'signs' in the Kantian sense (i.e. conceptual content which is not sensory). Ribot determined the pattern of word finding difficulty in what is now termed anomia to be:

"... [In] the best-known cases of partial dissolution (forgetfulness of signs), loss of recollection follows an invariable path: proper names, common nouns, adjectives and verbs, interjections, gestures. In each of these classes [of signs] the destructive process is identical. It is a regression from the new to the old, from the complex to the simple, from the voluntary to the automatic, from the least organized to the best organized." (1882:203)

Ribot's approach was original in his emphasis on 'age of acquisition' as a significant factor in the patterns seen in memory loss with aging. While the relation of language and memory to aging in adult pathology was discussed widely throughout the 19th century (e.g. Abercrombie, 1828, Richards, 1828, Graves, 1838, Upham, 1840), similar consideration of pediatric conditions was fairly limited. The investigation of childhood disorders of language and memory during this time primarily concerned extreme cognitive impairments of so-called idiocy and imbecility (see Wright, 1998) on the one hand, or the less severe impairments in speech production of stuttering and stammering (see Rockey, 1980 and Bobrick, 1995) on the other.

To put Ribot's contribution in perspective it is useful to review the state of affairs with respect to language learning in the second half of the nineteenth century. Many aspects of adult psychology were investigated throughout the century; however,

details of normal child development were not well elaborated. Indeed, the modern investigation of child language acquisition and infant development had its beginnings relatively late in the century with the works of Taine (1876), Darwin (1877), Sully (1880) and Preyer (1890). In contrast, within the literature on education at least, discussion of the teaching and learning of second languages was a well-established concern (see Howatt, 1984).

The notion that memory was the relevant domain for the consideration of second language learning was dominant throughout the century (Lorch, 2007). This conceptualization arose from classical models whereby language comprehension was considered a component of mind (cognition), whereas speech was considered a component of expression (motor function) (Whitaker, 1988). This conceptually significant division separated human behaviour that was a production of the corporeal being from that of the soul (i.e., non-materialist). Thus, Ribot's book on diseases of memory represented something of a watershed. In it, we find memory being discussed with a shift in emphasis and novel distinctions being drawn.

Ribot stated that the "true type of organic memory" is linked to motor memories (those that were called secondary automatic actions by Hartley (1749). In the discussion of how these motor memories are acquired and reproduced, Ribot made reference to classical notions on the formation of associations, but with a modern materialist interpretation:

"The organic memory thus formed resembles the psychological memory in all but one point—the absence of consciousness... In the method of acquisition, conservation, and reproduction, we find, then, that the organic memory is identical with that of the mind." (1882: 18).

Ribot is original in insisting that memory must be defined biologically and not as a faculty of the soul (Gasser, 1995). In this, he draws on contemporary innovations such as Claude Bernard's (1865) approach to empirical medicine with respect to the relation between pathological and normal function; to Herbert Spencer's (1855) with respect to notions of evolution in psychology; and to Hughlings Jackson (e.g., 1879 in Taylor, 1932) with respect to patterns of dissolution of behaviour. In fact, according to Gasser (1995), in *Diseases of Memory* Ribot was the first French writer to discuss Hughlings Jackson's ideas of regression from the complex to the simple, the voluntary to the automatic, and the more organized to the less organized in the pathological dissolution of behaviour due to nervous diseases. In addition, Gasser suggests that Ribot's approach to consciousness in relation to memory had a great impact on the development of Freud's ideas later in the century.

As for the formation of organic memory, Ribot stated that this depended on "dynamic affinities which become stable modifications of nervous elements through repetition."

The manner in which a number of elements group themselves and form a "complexus" [i.e. functional network] was thought to be the crucial factor in the actual formation of associations:

"We may compare the modified cell to a letter of the alphabet; this letter, always preserving its own identity, aids in the formation of millions of words in many languages, living and dead. By proper association, numerous and complex combinations may be derived from a small number of elements."
(1882: 28)

This provided an account for how a finite system can generate an extremely large number of items through the generation of combinations. Ribot then discussed the actual contents of memory:

“Each of us has in his consciousness a certain number of recollections: images of men, animals, cities, countries, facts of history, or science or language. These recollections come back to us in the form of a more or less extended series. The formation of these series has been very clearly explained by the laws of association between different states of consciousness.” (1882: 41-2).

In this statement, Ribot includes language learning together with the learning of items of world knowledge. However, he goes on to discuss the physical basis of the process of visual perception with the example of recognition of an apple, and then extends this explanation to word memory: “We thus see that the case does not differ from the preceding, either in nature or complexity, and that the memory of every word must have as its basis a determinate association of nervous elements.” (1882:44) In this discussion, Ribot cited as supporting evidence two cases from Forbes Winslow (1868); one of selective loss of the memory for the numbers ‘five’ and ‘seven’, and another of the loss of the knowledge of the letter ‘F’ (c.f., present day work on category specific semantic memory impairments such as Warrington and Shallice, 1984). Ribot drew the conclusion that “Recollection is not a faculty but...the result of aggregate conditions.” (1882: 54-5)

In considering those “conscious and semi-organized” recollections, Ribot grouped together examples of language learning, studying science and manual skills. In these instances, he stated that the recollection is not based on localization in time, nor personal impressions of the original experience. Thus, as this experience of a language, science or art becomes more detailed it becomes less “psychical” (i.e., conscious) and more in “the nature of an organic memory” (i.e., unconscious, learned, and automatic). Having given examples of what might today be considered learning of information and/or skills through formal education for older children, Ribot

concludes, “Such, in the case of an adult, is the memory of his mother tongue” (1882: 63).

This juxtaposition is perhaps unexpected to the 21st century reader who holds with Chomskian views on acquisition of a first language and innateness, or more neuropsychologically defined categories of learning (e.g., Gardner, 1983). It is clear that in his initial discussion of language learning Ribot was referring to adult foreign languages. Ribot even supplied a personal example: “I remember having learned such a German or English word, in such a city, under such circumstance. This is a *survival*, the mark of an anterior state, an original imprint.” (1882: 63). The close juxtaposition of these two statements--on first language acquisition in children and adult foreign language learning, makes it difficult to determine whether for Ribot there was any significant distinction between first and second language learning, or any relevance for age of acquisition on learning. It is important to avoid ‘presentism’ (i.e., anachronistically using present-day attitudes and knowledge) when reading such passages from the late 19th century. Nevertheless, Ribot was innovative in distinguishing the conservation of memory from its recollection on the one hand, and its temporal location on the other. Since the middle of 20th century, new distinctions between episodic, procedural, declarative, working, etc. have become accepted (e.g., Baddeley, Koppelman and Wilson, 2002).

However, further detail of Ribot’s conceptualization of multilingualism is revealed in his discussion of “exaltations of memory” or hypermnesia which results from morbid causes. Ribot states “In the evolution of partial hypermnesia no law is discernable... The only cases where there would seem to be any trace of a law are

those...where several languages returned successively to memory.” (1882: 178). He subsequently presents a series of cases of “the complete recovery of forgotten language” which can be brought on by anaesthetic sleep induced by chloroform, or ether, or febrile excitation. The case, which Ribot cites by way of illustration (from Duval’ article on ‘Hypnotism’ in *La Nouvelle Dictionnaire de médecine*) is as follows:

“An old forester had lived in his boyhood on the frontier of Poland, where he had never spoken anything but the Polish tongue. Afterward he lived in the German districts, and his children assert that for thirty or forty years he neither heard nor pronounced a single Polish word. During an attack of anaesthesia which lasted nearly two hours, he spoke, prayed, and sang, using only the Polish tongue.” (1882: 181).

Significantly, the consideration of the progressive return of several languages was not based on detailed descriptions from contemporaneous case material as its evidence.

This is notably in contrast to the material citations in the rest of the book. Ribot complains: “Unfortunately, authors who have reported facts of this kind speak of them as simple curiosities without giving the information necessary for their interpretation.” (1882: 181-2). The fact was that, subsequent to Broca’s description of aphemia in 1861, there were no detailed clinical case descriptions of acquired language disorders in polyglots until Pitres’ paper in 1895 (Lorch and Barrière, 2002).

The case material that Ribot drew upon for his examples of progressive recovery of language in polyglots was taken from Benjamin Rush’s work *Medical Inquiries and Observations upon Diseases of the Mind* (1812) published 70 years earlier. After a review of Rush’s cases, is Ribot’s now famous passage:

“This return of languages and forgotten phrases seems to me, when properly interpreted, to be only a particular case of the law of regression. In the progress of a morbid action which nearly always ends in death, the most recent formations of memory are first destroyed, and the destructive work goes on, descending, so to speak, from layer to layer, until it reaches the oldest acquisitions—that is to say, the most stable—incites them to temporary

activity, brings them for a time into consciousness, and then wipes them out for ever. Hypermnesia would then be only the result of conditions entirely negative; regression would result, not from a normal return to consciousness, but from the suppression of more active and more intense states, like a weak voice that could only make itself heard when more powerful organs of speech had relapsed into silence. The acquisitions of infancy and youth come into prominence, not because of some ulterior force pushing them out from their environment, but because there is nothing left to interfere with their freedom of action. Revivifications of this kind are, strictly speaking, only a return to pristine vigor, to conditions of existence which had apparently disappeared forever, but which the retrograde work of dissolution brings again into operation.” (1882: 183-4)

In this passage, the language is clearly Jacksonian (e.g., in speaking of descending layer to layer) although there is no direct citation. Ribot does credit Jackson directly in an earlier chapter: “Hughlings Jackson was the first to show that the higher functions—the complex, special, voluntary functions of the nervous system—were the first to disappear; that the lower, the simple, general automatic functions were the last to go.” (1882: 127) However, what is Ribot’s original contribution was his inclusion of a distinction between impaired access and impaired representation of memory. He argued that the evidence for this could be seen in the recovery of function: “The rapidity with which the patient learns shows that all was not lost.” (1882:201) Ribot described the mechanism for this recovery as follows:

“The cells may have been atrophied; but, if their nuclei (generally considered as the seat of reproduction) give origin to other cells, the bases of memory are re-established; the new cells resemble the parent-cells by virtue of that tendency of every organism to maintain its type, and of every acquired modification to transmit its characteristics to succeeding forms; memory in this case is only a phase of heredity.” (1882:201)

In the singular passage where Ribot discusses child memory he glibly asserts, “That children learn with marvellous facility, and that everything depending upon memory, such as the acquirement of a language, is easily mastered by them, is a matter of common observation.” (1882: 193) He attributed this to the fact that “the processes

of nutrition are so great that new associations are rapidly established” and goes on to contrast this to the rapid forgetting in the aged, which coincides with a diminution of this activity. [Note that the use of the term ‘nutrition’ meaning the process of supplying nourishment should be taken in the 19th century sense of the word. The *Oxford English Dictionary* cites George Day’s (1845) usage from his book *Animal Chemistry* (p. 161) “The metamorphosis of the plasma during the nutrition of every form of tissue.”]

In connection with the general dissolution of memory in dementia Ribot states: “Intellectual acquisitions—the technique of science and art, professional knowledge, the command of foreign languages—disappear little by little.” (1882: 119) In the advanced stages of dementia, “experiences and songs of childhood often return. Sometimes the subject forgets the greater portion of his own language. Expressions are revived, as it were, by accident; but, ordinarily, any words that may remain in the memory are repeated over and over in a purely automatic way.” (1882: 120)

In contrast, Ribot had very little to say about the so-called “congenital amnesia” found in cases of idiots, imbeciles and cretins. “The amnesia may extend so far in some instances as to prevent the acquisition and conservation of the ordinary acts that go to make up the routine of life” (1882: 131-2) (i.e. both anterograde and retrograde amnesia). Ribot pointed out that the exceptions were those idiots with special areas of memory that are highly developed (i.e. what is now called savant syndrome).

Partial Amnesia and Hypermnnesia

The ‘partial amnesia of signs’ is discussed by Ribot at length, and distinctions are drawn both between oral and other modes of communication, and between motor memory and higher order memory. Ribot emphasizes what is for him a significant distinction:

“Reflection will show that amnesia of signs [i.e. words] is not comparable to that of [amnesia of] colors, sounds, a foreign language or a period of life. It includes the whole activity of the mind; in this sense it is general; and yet it is partial, since the patient retains his ideas and recollections, and is conscious of his condition.” (1882: 154). [Emphasis added]

This quote shows a significant distinction is being drawn between the primary lexicon-- i.e. signs, and knowledge of a foreign language. In discussing what we would consider the dominant or mother tongue lexicon, Ribot described in detail the now well-accepted gradient of dissolution from proper nouns, substantives, adjectives, verbs, emotional expressions, and gestures found in aphasia and in other types of partial memory disorders. However, Ribot dismissed the study of first language acquisition as a source of relevant data:

“...it would seem reasonable that we should first examine its [i.e. language’s] individual development. This, however, is impossible. When we learn to speak, our language is borrowed. Although a child, as M. Taine has well said, ‘learns a language already made’ ...in fact he creates nothing.” (1882:169)

More notable still is the fact that in this 20-page discussion of aphasia there is no mention of bilingual speakers. Ribot discussed instances of what we would term bilingual aphasia at great length, but only under the heading of hypermnesia.

With respect to these “exaltations of memory”, Ribot discussed several cases of the return of a language acquired in childhood, and subsequently forgotten until disease and/or aging caused it to reappear (i.e. language attrition). These cases, cited by Ribot as evidence of hypermnesia with respect of “recovery of a forgotten language”, are

primarily drawn from early nineteenth century English writers. When discussing instances of memory disorder in multilingual speakers, Ribot gives citations from the works of Samuel Taylor Coleridge (1772-1834); John Abercrombie (1780-1844); William Hamilton (1788-1856); William Benjamin Carpenter (1813-1885); Forbes Winslow (1810-1874) in the UK, and Benjamin Rush (1746-1813) in the USA. Perhaps with the exception of Carpenter, the work of all of these authors' represents a psychological perspective of mental functions that does not refer to neuronal organization. This was true in all the writings prior to the localization of damage in the left frontal lobe and its association with aphasia in the pioneering work of Broca (1861).

This point becomes more significant when contrasted with Ribot's discussion of aphasia, for which his citations are primarily from contemporaneous French authors including Broca (1824-1880), Trousseau (1801-1867), Falret (1794-1870), and Proust (1834-1903), as well as Kussmaul (1822-1902) (German), and Hughlings Jackson (1835-1911), Broadbent (1837-1907) and Maudsley (1835-1918) (English). It is should be pointed out that none of these writers who discussed monolingual aphasia considered instances of bilingual aphasia in their works.

For Ribot, the most clearly described case of recovery of "forgotten language" was recorded by Benjamin Rush (1812). Rush's book on *Medical Inquiries and Observations, upon the Diseases of the Mind* includes a chapter devoted to "Derangement in the Memory." Rush states that "However strange it may appear...there is sometimes an oblivion of the most *recent*, the most *important*, and the most *interesting* events...the objects of knowledge either *perish* or *sleep*, only in the mind...[and can be] revived." (1812: 279) His first point describes difficulty

with word finding, giving the example of a man “who, in calling for a knife, asked for a bushel of wheat.” (1812: 276) His second point details examples of polyglot aphasia: “There is an oblivion of the names of substances in a vernacular language, and a facility of calling them by their proper names in a dead, or foreign language.” This is then contrasted with the opposite occurrence of “an oblivion of all foreign and acquired languages, and a recollection only of a vernacular language.” (1812:277).

Discussion and Conclusion

Ribot, like Rush, made categorical distinctions between loss of memory for names and words in monolinguals on the one hand, and the return of disused childhood languages in adult second language learners on the other. There is no consideration of instances where two or more languages are used concurrently in adulthood, or the acquisition of several languages from birth. More significantly, there is no mention of bilingual aphasics with language impairment affecting the two languages in parallel. Although a great many of the patients and clinicians in 19th century Europe and USA, most certainly including Ribot himself, were multilingual no description of such a situation could be found with extensive searching of this literature.

When ideas exploring the localization of function for language developed in the second half of the 19th century, the focus was initially on disorders of expression. In this context, it is significant that all mention of cases of what came to be known as aphasia after Trousseau (1864) were monolingual, while cases of bilingual aphasia were considered within the domain of memory disorder (Lorch, 2007). The most significant writer in France on aphasia in this period was Jean-Marie Charcot (1825-1893) whose lectures at the Salpêtrière on aphasia in 1883 appear to be greatly

influenced by his colleague and friend Ribot and his book on *Diseases of Memory* (Gasser, 1991). Charcot describes a case of trilingual aphasia in his 1883 aphasia lectures. This case is included in Albert Pitres' now classic paper of 1895.

Pitres extended Ribot's ideas and made them more clinico-pathologically testable. He insisted on an explicitly modular and modality based view of memory that could be demonstrated and verified by dissociations of disorders. Pitres first referred directly to Ribot in the introduction to his own model of reading and writing:

“Modern psycho-physiologists accept that the link which joins together the superior psychological faculties to the various types of expressions of thought is mainly represented by memory (for more on this subject see the most interesting book by M. Ribot, *Diseases of Memory*).” (Pitres, 1884, p859; translation in Barrière and Lorch, 2003)

Pitres used Ribot's notion of “partial memories” to refer to modality specific representations that have distinct neurophysiological centers. The disturbance of these partial memories after neurological insult would, in Pitres' model, result in “functional inertial” (i.e. inhibition) and followed by “restitution” (i.e. recovery from diaschisis) with the most familiar language memories reappearing first. Pitres explained that “the most familiar to the patient (usually, but not always, the mother tongue)...reappears first because it is the one that uses the most solidly fixed associations” (Pitres 1895, English translation, Paradis, 1983, 47). Pitres also elaborated on Ribot's initial proposals by suggesting that there was an important distinction between memories that were inaccessible and memories that were destroyed (c.f., the concepts of inhibition and loss in models such as that of Green, 1986)

The notion of “strength of associations” is also used by Pitres to explain why both children acquiring their first language and recovering aphasics understand speech before they are able to speak themselves: “because the verbal hearing center has the earliest and closest links to the language function.” (Pitres 1895, translated in Paradis, 1983, p. 47). In this way, Pitres redefined Ribot’s law of partial memory loss and restitution, which had been based on antecedence, by adding to it the notion of intensiveness or strength of association in memory representation. This explanation of restitution in polyglot aphasia is still referred to in the modern literature as Pitres’ rule.

Paradis (1998) plots the changing perspective in the history of bilingual aphasia research using Pitres (1895) as a starting point. He identifies a number of shifts in the focus of investigation. Paradis categorizes the research arising from Pitres’ paper throughout the first half of the 20th century as being primarily focussed on the different patterns of recovery found in bilingual aphasics. This interest in which variables will predict differential recovery patterns has been pursued by many researchers over the past 100 years. In the 1970s, Paradis notes the beginnings of psycholinguistically-based research into right hemisphere involvement in language functioning in bilingual subjects. Interest in determining localization of cerebral representations of multiple languages within the left hemisphere began to develop in the 1980s and was strengthened by the more recent developments in brain imaging technology (e.g., Klein, et al. 1994; Price, Green, and von Studnitz, 1999; Vingerhoets, et al. 2003). To a large extent, this question of how multiple languages are organized in the brain remains of fundamental concern today (Dehaene, 1999).

From this review of the writings of Ribot, and those of Rush upon which his ideas rest, it is clear that conceptual distinctions held in the 19th century led to research questions that were conceived of in a wholly different light from the present day. It throws into relief the strong distinctions currently assumed to exist between learning languages and learning other information, between first language acquisition and second language learning, and between lexical and syntactic knowledge of languages. These conceptual distinctions were not fully formulated until well into the 20th century.

The close reading of earlier works provides an opportunity to examine in turn what these theoretical assumptions bring to the current understanding bilingualism. It provides an opportunity to reflect on how different philosophical foundations influence research questions and treatment of evidence. The historical perspective offered in this review provides insight into current implicit assumptions regarding language and memory.

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