



Commentary

Academic Forgetting



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Fawcett and Hubert's (2020) essay on the functionality of forgetting is timely. It follows a current trend in psychology toward considering forgetting as a purposeful cognitive process serving important adaptive functions, rather than a cognitive failure (e.g., Nørby, 2015; Schacter, 2001). This is also the key point of a recent popular science article in *Nature*: "Long thought to be a glitch of memory, researchers are coming to realize that the ability to forget is crucial to how the brain works" (Gravitz, 2019,) p. 12.

As Fawcett and Hubert (2020) review, many types of forgetting can be distinguished, such as directed forgetting, retrieval-induced forgetting, and suppression-induced forgetting, to mention a few. We take this opportunity to introduce a new type of forgetting: *Academic Forgetting*. We arrived at this new concept when reading Fawcett and Hubert's article. First, we find that aspects of their target article illustrate academic forgetting, as most target articles probably would do. Second, we find that some of the roles they identify for everyday forgetting (their Table 1) can be extended to apply to academic forgetting. We will elaborate on these two points in the following. Finally, we will discuss some of the possible mechanisms underlying academic forgetting as well as some of its consequences.

Academic Forgetting in Fawcett and Hubert (2020)

All researchers, including ourselves, are prone to academic forgetting. Fawcett and Hubert's article is no exception. A PsycInfo search with forgetting as a keyword yielded more

than 2000 hits. Fawcett and Hubert's article includes 197 references. Obviously, a substantial reduction has taken place. It is equally obvious that such a reduction is necessary in order to write a meaningful article. However, Fawcett and Hubert do not describe their criteria for excluding literature. Quite the contrary, in the very beginning they leave the impression of providing an exhaustive review when stating their goal is "to organize what we know about forgetting into an overarching functional framework" (p. 2). What should be included and excluded in a review can always be debated. However, from our perspective we were surprised to find no consideration of some of the most substantial contributions to the study of everyday forgetting according to most historical accounts (e.g., Roediger & Yamashiro, 2019, for a recent review).

Let us begin with the beginning. In his groundbreaking book, pioneering experimental research on memory, Ebbinghaus (1885/1964) identified a systematic relation between forgetting and the passage of time, which subsequently was labeled as the forgetting curve. The forgetting curve has a steep drop in the beginning of the retention period and a slower decline as retention time increases. A meta-analysis (Rubin & Wenzel, 1996) based on 210 published data sets concluded that the best mathematical functions included the logarithmic, power, hyperbolic, exponential in the square root of time, and the hyperbolic in the square root of time. The basic monotonically decreasing shape of this curve has been replicated hundreds of times in a variety of domains. In addition to laboratory settings for

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laboratory material, it has been documented for memories of everyday, autobiographical events retrieved in response to cue words (Crovitz & Schiffman, 1974), and for the frequency of imagined future events using distance into the future (Spreng & Levine, 2006). None of this research is addressed in the target article.

Important exceptions to the forgetting curve have been identified, but they also receive no mentioning by Fawcett and Hulbert (2020). One is the reminiscence bump for autobiographical memories retrieved across the life span in middle-aged and older adults. The distribution of the memories differs from a monotonically decreasing curve by showing an increase in memories from the second and third decades of life (Rubin, Wetzler, & Nebes, 1986; see Koppel & Berntsen, 2015 for a review). Another highly replicable exception is childhood amnesia—a dramatic reduction in memories from the first years of life, which also goes unmentioned (for reviews, see Bauer, 2015; Nelson & Fivush, 2004).

Although Fawcett and Hulbert (2020) acknowledge the constructive nature of memory, they do not consider Bartlett (1932) in the context of everyday forgetting and his critique of the Ebbinghaus tradition. From this perspective, and its modern adherents (see Rubin, 2006 for a review), nothing can be shown to be forgotten. All that can be shown is a failure to remember in a particular context using a particular retrieval task Tulving & Thomsen (1973). Memories that were inaccessible in one situation may spring to mind in another (Berntsen, 2009). Fawcett and Hulbert also do not consider J.R. Anderson and L.J. Schooler's (1991) rational (functional) analysis of forgetting and their central claim that human memory is "adapted to the structure of the environment" (p. 400). According to J.R. Anderson and L.J. Schooler's theory, this allows memory to operate in ways that optimize the probability that a given memory meets a need for information in an ongoing situation. The gains (informational relevance) associated with retrieving the memory should exceed the costs (cognitive efforts) for the system to work adaptively. Information with a higher probability of meeting an informational need therefore is made more available. Essentially, this means "that at any point in time, memories vary in how likely they are to be needed and the memory system tries to make available those memories that are most likely to be useful" (p. 400). This *need probability* is what accounts for forgetting in J.R. Anderson and L.J. Schooler's (1991, 2000) theory. Although this theory is a serious attempt to provide a systematic and testable account for the adaptive constraints governing everyday forgetting, it receives no attention in Fawcett and Hulbert (2020).

From our perspective, the literatures we have mentioned above would belong in a more complete discussion of everyday forgetting and its functional values. The fact that this literature is left out with no explanation or justification illustrates what we mean by *academic forgetting*. Academic forgetting takes place, when a scientific paper on a given topic leaves out substantial parts of previous work of relevance for this topic, and thereby reduces the range of theoretical perspectives and prior findings. Readers may object that, to some degree, this is true for almost any psychology paper. We agree that Fawcett and Hulbert (2020)

illustrate a phenomenon that is more general. To further support our claim that this article is an example of academic forgetting, consider two figures. Figure 1 illustrates the relative dominance of authors cited by Fawcett and Hulbert in their list of references. The size of the names depends on the number of times a name appears in the references. One author, M.C. Anderson clearly dominates with 20 citations. The following four most frequently cited authors (Storm [11], R.A. Bjork [8], Fawcett [8], and Hulbert [7]) have all coauthored at least one of their cited papers with M.C. Anderson, and in some cases collaborated with each other. This suggests that the target article is dominated by a network of authors, who have a history of collaboration, who share interests and ideas and who tend to cite one another. Although this work is relevant to the topic, important, and insightful, it nonetheless represents a particular approach to the study of forgetting, which alone does not do justice to the complexity of the field.

Figure 2 illustrates authors who are not cited at all by Fawcett and Hulbert (2020) but which from our perspective belong in a review of everyday forgetting. This alternative figure does not do justice to authors, who are cited once or more in Fawcett and Hulbert, but are still underrepresented compared to their contributions. Their importance has faded and they are hard if not impossible to see in Figure 1. Figure 2 only includes authors who are not cited at all. We are well aware that readers are likely to miss authors we have forgotten, which simply underscore the point that academic forgetting is pervasive.

Figure 3 illustrates that the references in Fawcett and Hulbert (2020) forms a forgetting curve when their frequency is plotted as a function of time since publication. It is our assumption that an analysis of the publication years in the reference list of most psychology articles would show similar, or maybe even steeper, forgetting curves. Thus, we do not wish to claim that this curve in any way is unique for Fawcett and Hulbert's target article—which, in fact, seems to have a higher frequency of older references than what might characterize a typical psychology article. Still, a dominance of references to recent work dropping off quickly, followed by a slower decline as retention time increases, is consistent with a standard forgetting function (Ebbinghaus, 1885/1964). The retention curve shown in Figure 3 was best fitted to a hyperbolic function ($r^2 = .975$). The hyperbolic function is a standard retention function, often used in studies of animal learning, but other types of retention data are also fitted well to this function (see Rubin & Wenzel, 1996, for systematic analyses).

Functional Values of Academic Forgetting

We are all prone to academic forgetting. Often, it may reflect ignorance of approaches that are distant from one's own, or that psychology is an increasingly diverse and multifaceted field for which reason it is more and more difficult to do justice to its complexity. However, academic forgetting can also have functional (as well as dysfunctional) values, to which we now turn. Our discussion of the functional and dysfunctional values follows the three roles aptly identified by Fawcett and Hulbert (2020): The Librarian, the Inventor, and the Guardian.

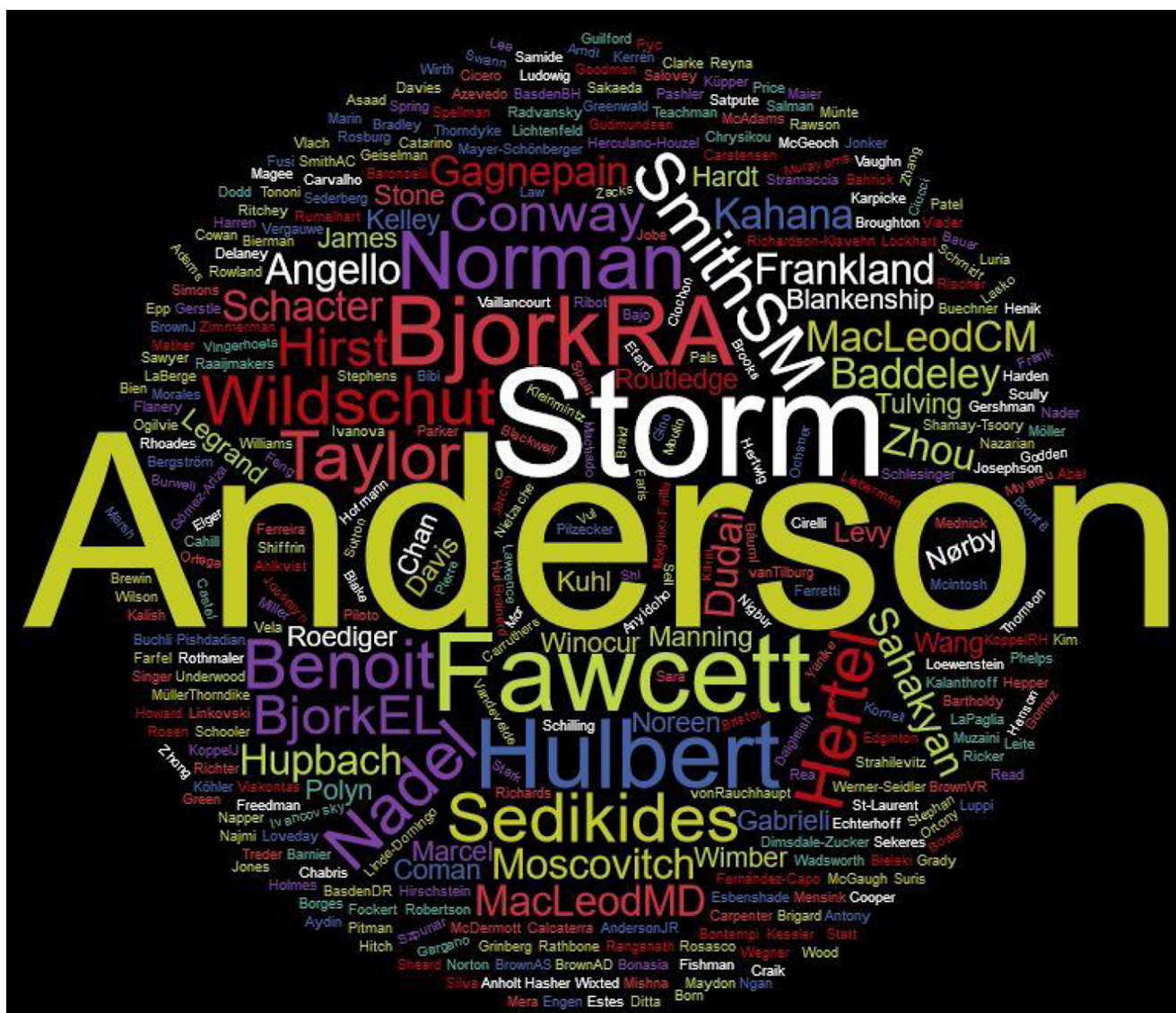


Figure 1. Word cloud based on last names of authors to publications in the reference list of Fawcett and Hubert's (2020). The size of the names depends on the number of times a name appears in the references. Cases with authors sharing last names are distinguished by initials (e.g., BjorkRA, BjorkEL). Anderson refers to M.C. Anderson. Another Anderson (J.R. Anderson) is cited once and designated as AndersonJR in the word cloud. If a publication appears in an edited book, the authors of edited book are not included in the word count.

The Academic Librarian. Fawcett and Hubert's (2020) Librarian facilitates efficient and well-organized cognition by reducing access to an otherwise infinite supply of information and by supporting integration and abstraction. It enables a knowledge base that is up-to-date. Clearly, these functions are also very important to ensure a meaningful accumulation of knowledge in a scientific field. It appears psychology could need more "academic librarians" who meticulously organize and update knowledge of the field, by writing systematic and integrative reviews that follow transparent and objective inclusion and exclusion criteria. Unfortunately, psychology has relatively few outlets for such ambitious reviews and theoretical integrations. Instead, most theoretical reviews are in the form of short introductions to empirical papers. These reviews are almost never exhaustive, and typically biased to emphasize the novelty and importance of the empirical project they serve to motivate, and

sometimes fail to acknowledge the first demonstration of the phenomenon under study. Furthermore, the fact that more and more journals favor short manuscripts with strict word limits, especially for the introductions and discussions, appears to be an incentive for increased, less healthy academic forgetting that could, if this continues, approach academic amnesia. Emphasis on the most recent work is the general principle in most academic fields. However, this principle only works if science is cumulative. That is, it only works if the previous work adequately has been developed on the basis of insights from preceding studies and integrated into them. If earlier studies simply have been overlooked or neglected, then a focus on the most recent work no longer is producing cumulative state-of-the-art knowledge, but rather reflects current fashion or power structures in the field. Thus, while forgetting governed by the librarian generally is healthy and even necessary, it only works under some conditions.

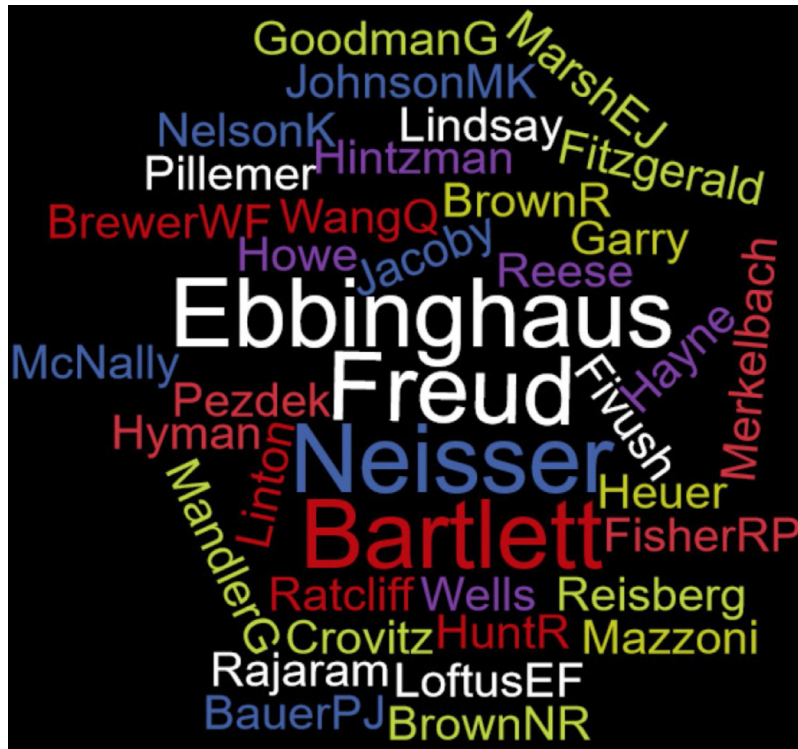


Figure 2. Word cloud for names of authors who have contributed to everyday forgetting research but are not cited by Fawcett and Hubert (2020). Names are not weighted by amount of contribution. However, four outstanding (deceased) researchers (Bartlett, Ebbinghaus, Freud, and Neisser) are made twice as big as the rest to highlight their exceptional impact. Authors cited at least once are not included, even if underrepresented in the target article and thus almost invisible in Figure 1, such as J.R. Anderson, L. Hasher, K.B. McDermott, L.J. Schooler, J.T. Wixted, and many others. We left ourselves out as well (although we are not cited by Fawcett and Hubert), in solidarity with those we forgot.

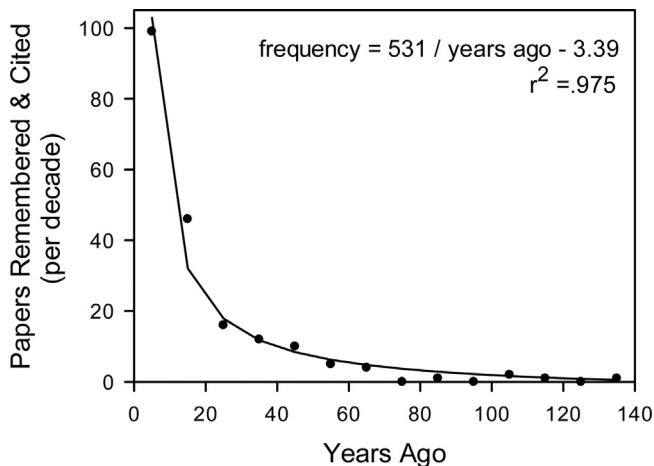


Figure 3. Number of references per year since the time of their publication in the reference list of Fawcett and Hubert (2020), fitted by a hyperbolic function. The classic forgetting function shown in the figure is here an *academic forgetting function*, showing how often published work is *remembered* and cited over 137 years in the target article.

If these conditions are absent, less healthy forms of academic forgetting may take over and become dominant, which takes us to the next parts.

The Academic Inventor. One important value of the Inventor in Fawcett and Hulbert's (2020) taxonomy is to use forgetting to free oneself from past experience in order to discover

new ideas or solutions. Obviously, the history of science holds plenty of examples of individuals who developed new and influential ideas by actively breaking away from history. Bartlett (1932) breaking away from the verbal learning tradition founded by Ebbinghaus is just one of many examples of this in memory research (see Roediger & Yamashiro, 2019). However, usually these advances do not take place by forgetting or ignoring past contributions, but by having a deep and critical understanding of them, and on this basis developing alternatives.

Nonetheless, sometimes the introduction of new scientific concepts may actually reflect forgetting. As Fawcett and Hulbert (2020) mention, "the old can become new again when one's perspective is not so constrained by the past" (p. 10). In academia, when not constrained by the past, old concepts may become dressed up as new and be used in a different domain. History of psychology holds many successful cases of such transformations. Here we provide only a few examples to make our point. Retroactive interference (McGeoch, 1932) found new applications in the misinformation effect (Loftus, Miller, & Burns, 1978). Carmichael, Hogan, and Walter's (1932) classical experiment showing that the use of different verbal labels to describe visual forms influenced subsequent drawing of the figures was many years later recaptured as verbal overshadowing (Schooler & Engstler-Schooler, 1990). Likewise, *Daydreaming* (Singer, 1966) came back as *mind wandering* forty years later (Smallwood & Schooler, 2006). One of the most extensive cases

in forgetting research is the cognitive revolution, which vilified the extensive research on classical and operant conditioning, research that often had to be reinvented. Although these transformations and extensions might have left some of the original ideas behind and thus had their intellectual costs, they also had clear benefits by taking old insights in new directions, showing their relevance in novel contexts, and spurring productive new research programs. Still, better integration with the old versions of the same concepts might have done even more service to the field.

The Academic Guardian. The Guardian in Fawcett and Hulbert's (2020) taxonomy "maintains a coherent, positive self-image and permits us to disengage from harmful thoughts and behavior" (p. 2). Academic forgetting may serve to shield the researcher from counterevidence or alternative views the same way as the Fawcett and Hulbert suggest ordinary forgetting helps to maintain a positive self-image by shielding the person from remembering unpleasant or embarrassing past experiences. While this may be healthy for the individual to keep up a positive self-image, it is destructive when this type of self-serving forgetting is applied in an academic context, because it contradicts the very basis of science: the principles of objectivity and transparency. Unfortunately, it seems to be a problem. Bibliometric analyses raise issues of "citation farms" where researchers are boosting their citations by forming small clusters of authors who massively cite one another (Ioannidis, Baas, Klavans, & Boyack, 2019). A recent study also points to a problem with some reviewers apparently abusing their role to request citations to their own work (Baas & Fennell, 2019). In other words, the emphasis on citation analyses in career evaluations may lead to biased reviews of the literature, reviews that serve to boost a person's or a group's citations rather than describing and integrating earlier work. One might object that the peer review system prevents such practices. To some extent we agree. However, at the same time we here add the concern of *reviewer cartels*, where researchers have implicit agreements with other researchers about reviewing one another's work favorably. Small, specialized areas that have their own social structure can support cumulative research, but also foster reviewer cartels. In a situation where it has become increasingly difficult for editors to find reviewers, this might not be an unrealistic fear. That said, we are confident that most researchers are strongly committed to basic scientific principles and that extreme cases of guardian-based academic forgetting still are rare. Yet, we are probably all sinners in the more moderate versions of this type of (self-serving) academic forgetting.

Mechanisms and Perspectives

We want to finish this commentary by briefly and speculatively addressing some possible mechanisms underlying academic forgetting. In contrast to normal forgetting, measured at the individual level, we can rule out decay. Our data sources in terms of journal articles and books clearly are not subject to decay. Quite the opposite, they are as accessible as ever in the digital age. At the same time, it is our impression that academic forgetting is a growing problem. Obviously, given the abundance

of information available in the digital age and the relative ease of accessing this information, one problem may be interference. It is increasingly hard to exhaustively review a field. We are limited to area- or paradigm specific overviews, which involves obvious risks of missing important connections and developments in other domains than one's own expertise, and thereby reinventing the wheel or exaggerating the novelty of one's own contributions. Additional factors are a growing emphasis on brief research reports, short deadlines, and expectations of short turn-around times for manuscripts. This is unlikely to stimulate quality, but it is likely to spur academic forgetting. However, as a science, we have to accumulate knowledge, not just publish papers. Failure to review previous research (i.e., academic forgetting) may be as big a problem for psychology as failure to replicate it.

Author Contribution

The authors collaborated on writing this commentary.

Declaration of Competing Interest

The authors report no conflict of interest.

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