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Competence Attrition: A linguistic theory of the effects of external competence acquisition for organizations

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Abstract

What happens to old competences in organizations when new competences are acquired? In this paper, we propose a competence attrition theory to explain the effects of acquiring new competences on previously acquired ones. While the presumed positive role of available competences for the acquisition of new competences has been the subject of extensive research, the potentially negative effect of the acquisition of external competences on the availability and use of existing competences has not been sufficiently theorized. We aim to do so by extending existing learning and absorptive capacity theories with insights from linguistics on competence attrition. Specifically, informed by parallel patterns in language acquisition and attrition, we develop a set of focused propositions on competence acquisition and attrition in organizations. We end the paper by discussing the implications of our theorizing for existing theory and research.

Keywords

absorptive capacity, competence attrition, knowledge, language attrition, learning, organization

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Introduction

Although the notion that existing competences and knowledge can impact the acquisition of new competences has been extensively discussed (Cohen & Levinthal, 1989), little thought has been given to what happens to existing competences within organizations when new competences are acquired. Introducing a competence attrition theory, we theorize about the relation between existing competences and the acquisition of new external competences. The specific concept of competence attrition that we propose and develop in the paper refers to a partial competence loss due to new competences vying for attention with older, previously acquired competences; and in some instances, supplanting previous forms of knowing.

In general terms, a competence is the ability to do or perform something at both the individual and organizational levels (Le Deist & Winterton, 2005; McEvily et al., 2000). While the concept of competence is associated with that of knowledge (Winter, 1988), competence has a greater proximity to action, as it is deemed an 'experience-near concept' (Geertz, 1983). In fact, competence is the ability to perform a specific task or task-set, and we can speak of a competence only when there is a fit between specific knowledge and the carrying out of a specific task (Sandberg, 2000). In other words, 'competence is both knowledge-specific and task-specific' (Von Krogh & Roos 1995, p. 62). Given this relationship between competence and knowledge, insofar as it fits a particular task, knowledge can be seen as a necessary, albeit insufficient, basis for competence (Le Deist & Winterton, 2005).

Why is it important to understand what happens to old competences when new competences are acquired? This issue is relevant since organizations are continuously in the process of having to reconsider or revise past competences in light of new competences as they grow and develop over time. For example, a firm may in the past have resorted to outsourcing certain components to suppliers in distant countries, but may come to reconsider its production strategy by integrating the manufacturing of these components, or reshoring and transferring production to other, nearer suppliers. In this case, the firm will need to assess whether the competences it had in the past are still present, and whether it is able to go back to producing these components itself or transfer the technology to new suppliers (Lechner et al., 2020). More generally, while the relationship between new and old competences is perhaps by itself not a new topic (Schooler & Hertwig, 2005), we argue that it merits further theoretical attention. Specifically, we argue that it has not been adequately theorized in a sufficiently nuanced manner, despite it being a relevant and significant problem within organizations. We therefore ask in this paper: *What happens with old competences when new competences are acquired?*

We address this general question in two steps. First, building on existing theories on the influence of competences in organizations, we review and evaluate past theorizing, highlighting how the predominant focus in past research has been on knowledge acquisition with little attention being devoted to the 'negative' effects of new knowledge acquisition and possible forms of attrition. Second, to tackle the question of potential attrition (i.e. the loss of ability in a previous competence and its gradual decline), we draw on an insightful analogy with linguistics (De Bot & Clyne, 1989; Schmid, 2011), which allows us to conceptualize the contours of the attrition process and develop a number of formative propositions on when and how competence attrition takes place in organizations.

Within the existing literature, the prevalent focus has been on an organization's absorptive capacity as a way of explaining the relationship between an organization's current stocks of knowledge and its acquisition of new knowledge (Cohen & Levinthal, 1989, 1990). Absorptive capacity has been one of the most influential concepts in the management field and within the social sciences at large, as witnessed by the considerable number of studies also published outside the management domain (Fischhoff, 2018). Simply put, absorptive capacity suggests a positive relationship between existing knowledge in

the organization and the acquisition of new, external knowledge. Indeed, testing this general relationship has fuelled ongoing empirical investigations (Knoppen et al., 2022; Melnychuk et al., 2021). In this paper, we compare our conceptualization of competence attrition with the main tenets of the absorptive capacity construct to derive novel theoretical propositions on knowledge and competence acquisition at the organizational level, on the effects of learning new competences, and on possible interaction effects when the work of organizations involves multiple competences.

Although absorptive capacity is generally considered an enabling factor for acquiring new competences, the theory does not actually specify the underlying enabling conditions. Instead, it tends to assume some form of positive interaction between competences, yet without laying out the interaction process (Zahra & George, 2002). The possibility of pre-existing competences having a negative effect on the acquisition of new competences has not been considered in this literature. In the paper, we therefore offer a theoretical formulation that considers knowledge acquisition in a more comprehensive way, accounting for the interactions between acquired competences and their positive as well as potentially negative effects. In doing so, we aim to open up the black box of competence acquisition processes, elaborating different pathways and a broader range of possible effects. We furthermore challenge the largely 'positive' role and effect of new competence acquisition that absorptive capacity theory posits by introducing the possibility of both positive and negative interaction effects between existing and new competences.

The remainder of the paper is structured as follows. We start with reviewing and synthesizing past work on organizational knowledge and competences. We then problematize prior work and make the case for a more nuanced theoretical perspective on the impact of new competences on previously acquired ones. Thereafter, we turn to language attrition theory in linguistics as a basis for developing a theory of competence attrition in the organizational domain. Informed by these insights, we develop our main arguments and formalize a set of propositions. We illustrate the potential application of the theory with real-life examples from organizations. We conclude by discussing the implications of our theory development and its overall contributions.

Existing Theory

The relation between external and internal organizational competences

The role of acquiring new knowledge from the external market and institutional environment has long been considered essential for organizational performance and survival (Chesbrough, 2003; Laursen & Salter, 2006). Such external knowledge can be acquired, learned, or accessed (Buckley, et al., 2009; Grant & Baden-Fuller, 2004). The learning of new knowledge in relation to existing knowledge is often considered a prerequisite for its subsequent use by an organization; and has been generally conceptualized as a firm's absorptive capacity (Fischhoff, 2018; Zahra & George, 2002). The number of articles published in scientific journals on the concept of absorptive capacity has continued to grow (Song et al., 2018), as evidenced by for example Scopus reporting more than 400 articles being published annually since 2018 (compared to less than 70 in 2004).

Indeed, absorptive capacity has been the default concept that is applied to knowledge acquisition and learning processes in different settings, including, but not limited to, the study of interaction modes in supply chains (Dobrzykowski et al., 2015), new product development (Backmann et al., 2015), the organizational implications of the innovation process (Peeters et al., 2014), entrepreneurship across cultural settings (Flatten et al., 2015), the impact of knowledge flows on regional innovation (Miguélez & Moreno, 2015), the advantage of newness in startups (Posen & Chen, 2013), and even concerning different directions in the fields of strategic management and organization studies (Tortoriello, 2015; Volberda et al., 2010).

The absorptive capacity construct

As mentioned, absorptive capacity is generally defined as the meta-ability of an organization to identify, assimilate and exploit knowledge from the external environment (Cohen & Levinthal, 1990). Even more precisely, it captures the firm's ability to value, assimilate, and commercially exploit external knowledge that is new to the firm. Cohen and Levinthal (1990) introduced this concept, defining absorptive capacity explicitly as a 'learning process', and implicitly as a meta-capability or 'potential ability' where the organization 'needs prior related knowledge to assimilate and use new knowledge' (Cohen & Levinthal, 1990, p. 129).

Defined in this way, the absorptive capacity concept thus speaks not only to the process of acquiring, but also to the very ability of accessing and using any new knowledge (Grant & Baden-Fuller, 2004). In the technology diffusion literature, the ability to acquire knowledge from the external environment had traditionally been seen as related to R&D efforts (Allen, 1977; Tilton, 1971). Cohen and Levinthal (1989) argued that a firm's absorptive capacity would be a better anchor to think about concerning knowledge acquisition and which, they argued, effectively provides a further stimulus to invest in R&D, strengthening the firm's very ability – i.e. its absorptive capacity – to exploit the amount and value of knowledge available in the external environment (Lane et al., 2006, p. 836). Specifically, they argued that in more demanding learning environments, firms who have developed their absorptive capacity are better able to acquire and learn new knowledge. In formal terms, they posited that in a more demanding learning environment, the marginal effect of R&D on absorptive capacity is higher, while in less demanding learning environments, the firm's R&D activity has a lesser impact on the firm's subsequent absorptive capacity to acquire, assimilate and exploit new knowledge (Cohen & Levinthal, 1990, p. 140). Conceived in this way, absorptive capacity is essentially path-dependent, suggesting a process of cumulative learning and the building up of stocks of knowledge (Distel, 2019; Van de Ven et al., 2019). This accumulation logic is evident in another common definition of absorptive capacity as

> a firm's ability to utilize externally held knowledge through: (1) recognizing and understanding potentially valuable new knowledge outside the firms through exploratory learning; (2) assimilating valuable new knowledge through transformative learning; and (3) using the assimilated knowledge to create new knowledge and commercial outputs through exploitative learning. (Lane et al., 2006, p. 856)

In short, processes of learning are not only central to the acquisition of external knowledge (Buckley et al., 2009), but are similarly key to the internalization, evaluation and continuous use of knowledge as a newly established competence within the organization. Thus, to sum up, the absorptive capacity of firms has a cumulative nature. That is, for a firm, its ability to acquire further knowledge is a direct function of its acquisition of previous knowledge, such that the more stocks of knowledge an organization holds internally, the higher its absorptive capacity to integrate – i.e. learn and exploit – new external knowledge.[1]

Learning, memory and competence acquisition

This cumulative assumption is consistent with general behavioural theories of learning at both the individual (Bower & Hilgard, 1981) and organizational level (Cohen & Levinthal, 1990; Walsh & Ungson, 1991). Cohen and Levinthal's (1989, 1990, 1994) studies furthermore linked the emphasis on learning to linguistic categories of knowledge and memory; for example, when they argued that

> to understand complex phrases, much more is needed than exposure to the words: a large body of knowledge must first be accumulated. After all, a word is simply a label for a set of structures within the memory system, so the structures must exist before the word can be considered learned. (Cohen & Levinthal, 1990, p. 129)

In other words, and as illustrated with this quote, a further key assumption with the absorptive capacity construct is that organizations build up stocks of knowledge, as an 'organizational memory', that involves knowledge structures and language-based concepts, as well as procedural knowledge about how to use such concepts within the organization as a learned competence. Such a built-up memory system is then in turn crucial to the learning of yet another 'language' or set of concepts. Furthermore, the knowledge structures constituting the organizational 'memory' on which a firm's absorptive capacity operates 'depend on the absorptive capacities of its individual members' but will, through routinization, gain a semi-autonomous status, such that it forms an absorptive capacity that is 'distinctly organizational' (Cohen & Levinthal, 1990, p. 131).

As we have highlighted so far, the existing literature around the construct assumes that prior knowledge underlies absorptive capacity, and that learning and the availability of existing stocks of knowledge (as 'organizational memory') have important implications for the development of a firm's absorptive capacity over time. This is the case because, first, 'accumulating absorptive capacity in one period will permit its more efficient accumulation in the next' (Cohen & Levinthal, 1990, p. 136), and second, as 'the possession of related expertise will permit the firm to better understand and therefore evaluate the import of intermediate technological advances that provide signals as to the eventual merit of a new technological development' (Cohen & Levinthal, 1990, p. 136). This entire process is effectively conceptualized as a 'lock-out' effect, in comparison to the 'lock-in' effect known from work on path dependencies (Arthur, 1989). The general argument here is that ceasing to invest in absorptive capacity might 'lock out' organizations from acquiring new external knowledge in the long run, especially in fast-moving environments where the gap between any previously acquired knowledge and fast-changing external knowledge might quickly become too large (Cohen & Levinthal 1989). This 'lock-out' assumption implies that firms benefit from keeping a close and direct connection between the most recent internally acquired knowledge and external knowledge for effective acquisition and learning, suggesting as well that firms continuously work at keeping the gap between the two within limits. Another conclusion that can be derived from this argument is that the most recent internally acquired knowledge is a fundamental springboard for whatever external knowledge is acquired next by a firm.

Consistent with this line of reasoning, much work over the years has investigated the 'cognitive proximity' between recent internal knowledge and new external knowledge as key to the ability of a firm towards accommodating and assimilating new knowledge into a fully formed competence (Grant & Baden-Fuller, 2004). The further guiding assumption here has been that the more proximity (or less distance) there is between internal and yet-to-be-acquired external knowledge, the easier knowledge acquisition, as part of a firm's absorptive capacity, will be (Nooteboom et al., 2007). Some work in this vein additionally suggests a simple functional form argument, where cognitive distance (as the reverse of proximity) may hamper knowledge acquisition and learning but may also harbour the potential for creative connections and novel innovations (Nooteboom et al., 2007, p. 1019).

In general terms, then, the relationship between familiarity (through cognitive proximity) and absorptive capacity assumes an interaction, even if extant theorizing on absorptive capacity does not explicitly specify the enabling conditions for such competence acquisition. The central idea, however, is that maximum overlap requires minimum effort to integrate the 'new', as similarity creates the potential for fertile interaction. This also suggests, as a baseline argument, that absorptive capacity favours the integration of proximate and related knowledge. That is, the more similar the external knowledge compared to the stock of internal knowledge, the more efficient and effective the integration of knowledge will be. This also means that the integration of what is initially

dissimilar external knowledge will not only be more challenging, but also often less efficient and effective.

Central limitations of the absorptive capacity construct

Summarizing our review of the absorptive capacity concept, we highlight what we see as the key limitations of the construct. We use those limitations as a steppingstone for our own theory development concerning competence acquisition and attrition.

First of all, the learning underlying absorptive capacity is considered to be cumulative in nature, and, based on this additive logic, appears to be potentially infinite. Yet, organizational memory, and the knowledge accumulation on which it rests, is not unbounded, and is subject to its own memory-related dynamics as well, including memory loss and forgetting. Specifically, while forgetting plays a key role in individual as well as organizational memory (Schooler & Hertwig, 2005), it has been largely ignored in relation to absorptive capacity (Cohen & Levinthal, 1990). This limitation is even more acute when we consider the fact that studies on organizational forgetting suggest that it is central to the development of new knowledge as part of the innovation process; as effectively an antecedent and not a consequence of the acquisition of new knowledge and organizational competences (Huang et al. 2018).

As a second main limitation we have highlighted how absorptive capacity assumes that the most recently acquired knowledge is central to any subsequent knowledge that is acquired. This enabling function only considers the effect that internal knowledge has on the external knowledge (i.e. acquisition). However, the idea of integrating and assimilating new knowledge into old knowledge (Grant & Baden-Fuller, 2004) should consider the inverse effect as well. In fact, the new to-be-acquired knowledge might have an impact on the existing knowledge base as well. For example, it might have the potential to modify the existing knowledge base and the competencies that it enables. The absorptive capacity construct does not consider this potential influence on internal knowledge when external knowledge is being acquired. The construct, as part of its functional form, only considers potential interaction effects between knowledge components from the old to the new component, but crucially not from the new to the old. This one-sided view of interactions and interaction-related effects is a central limitation.

In this paper, we aim to address these limitations by proposing a theory on the effects of external competence acquisition on the organization's current competencies and vice versa. The theoretical formulation that we propose considers those effects not to be unidirectional – from the existing to the new competence – but bidirectional. We furthermore consider how this influence is not limited to an enabling condition but sets in motion a process of iterative interactions between competencies leading to a variable 'net' outcome. In this way our analysis also goes beyond previously suggested concepts such as 'unlearning' or 'negative transfer' (Singley & Anderson, 1989; Tsang & Zahra, 2008) that stipulate a reverse effect, compared to absorptive capacity, but do so largely in an episodic manner, and without considering the process of competence loss or attrition that, in time, it might lead to.

Our interest in the process of competence development initially led us to explore other disciplinary areas that deal with the consequences of learning new things. As acquiring new knowledge is like learning a new language, we turned our attention to linguistic theories that draw on the relation between the knowledge of an existing language with the acquisition of a new language. Based on these parallels, we draw on specific insights from the body of work in linguistics on language attrition (Seliger & Vago, 1991) and reason by analogy (Ketokivi et al., 2017) to conceptualize analogous processes in the context of organizations acquiring new competences. On this basis, we offer a theoretical formulation of competence attrition that accounts for different types of competences and with a further specification of contextual and boundary conditions (Whetten, 1989).

Competence attrition theory based on analogical reasoning

As mentioned, we draw on writings on language attrition in linguistics to develop a competence attrition theory (henceforth, CA). In linguistics, language attrition is defined as the 'non-pathological' loss (i.e. not due to trauma, developmental or general cognitive delays) of a language in a bilingual individual (Köpke, 2004; Seliger & Vago, 1991). Attrition research generally focuses on the extreme case of a partial loss of the first language of a native speaker when learning a new second language (Schmid, 2002).

As mastering a language is considered a competence at the individual level (Hansen, 2001; Schmid, 2013; Sharwood Smith & Van Burren, 1991; Von Krogh & Roos, 1995), we abstract out the language attrition processes that we argue might similarly describe competence attrition in organizations (De Bot & Clyne, 1989; De Bot & Stoessel, 2000). Specifically, we argue that we might benefit from research on language attrition to develop theory on competence acquisition and attrition by using the underlying analogy not as an expressive key 'to evoke or describe', but above all, as an explanatory key 'to explain and predict' (Gentner, 1981, p. 18; Cornelissen & Durand, 2014; Ketokivi et al., 2017).

Turning to the domain of linguistics, a pervasive assumption there is that the native or first language (L1) that an individual learns in her or his culture of origin (first or native language) is potentially affected by a second language (L2) when this one is learned later in life. Concretely, when individuals begin learning a new language, the language or languages already known will influence how they learn and use the new language. In some respects, the acquisition of a new language-related competence can benefit from previously acquired competence of a language and its continued use. As observed in linguistics, such a new competence, on the one hand, is influenced by the old so that individuals keep their accents or continue making mistakes in L2 by applying, for example, the grammar rules of L1. On the other hand, the new competence being acquired can also affect the language already known and how it is being used (Pavlenko, 2002). Despite ongoing debates on the most effective methodologies for learning a new language (Khasinah, 2014), competence of L1, or one's native language, generally provides a tool for learning L2. That is, learning a new language is facilitated by using the original language to compare and transmit vocabulary components, translations, grammar, and pronunciation rules from L1 to L2. However, L1 might also at the same time represent a 'cumbersome' element that can make it more difficult to learn the vocabulary, rules of grammar, or pronunciation specific to L2. Indeed, the similarity between L1 and L2 can initially offer learning advantages but can also be a disincentive to learn L2 carefully and for a speaker to become more fluent in the process. In particular, the difficulty of disconnecting from the use of the original language, coupled with an individual not making a real effort to learn the correct form of L2, might lead to not switching fully to the new language and the individual not reaching higher levels of fluency, i.e. leading to a reduced competence in the new language (Grosjean, 1989). A central insight here, and one that we expound on below, is that the interaction between competencies in using different languages affects language acquisition and attrition (Schmid & Köpke, 2007).

Two further interesting insights emerge from this comparison that are central to our theoretical arguments. First, the specific conditions of L1 have an influence on the acquisition of L2. Second, the interactions are bidirectional, moving back and forth between L1 and L2. Specifically, language attrition, the process of losing one's ability in using a native or first language, is associated with specific conditions and takes place when individuals not only acquire knowledge of a second language (Schmid, 2011, pp. 15–17), but (1) also make particularly intense and frequent use of it, e.g. on a daily basis, (2) experience a simultaneous reduction in the use of the competence developed previously, and (3)

operate in a different language environment in which the original competences are often isolated (e.g. only spoken at home) and without other actors present who would otherwise stimulate their use. In other words, attrition is paired with a significant reduction in exposure to the use of the older competence for which activation thresholds are no longer reached, as in the case of individual emigrants fully immersed in a new language environment (Paradis, 2007, p. 125).

Theory and research in linguistics furthermore suggests that a language learned after one's mother tongue might generate both multicompetence integration as well as the possibility of language attrition (Schmid, 2011). Attrition manifests itself, in particular, when the second language is used repeatedly, frequently, continuously, and accompanied by a significant reduction in the input and use of the original linguistic competence. Attrition occurs due to experiencing a different linguistic environment and is thus context-dependent (Schmid, 2011, p. 12). Among the explanations for this phenomenon is the so-called activation threshold hypothesis, understood as a lack of stimulation concerning the use of L1, as the original competence (Paradis, 2007, p. 125). According to this hypothesis, the activation threshold predicts that, *ceteris paribus*, the less a language is used, even if it is one's mother tongue, it may lead to gradual losses. Failure to use a language does not determine its immediate loss, however, but the hypothesis instead suggests that it requires more effort for its subsequent activation and retention. Functionally, attrition occurs when the structures and components of the new competence interact with elements of the old competence that are still strongly present in the person or group (Schmid, 2011, p. 16).

We argue that competence attrition at the individual level as it relates to learning a second language is applicable to the organizational level. There are several good reasons to defend this position. In the first place, the source phenomenon – language attrition – is used to formulate and articulate theory through an analogy that works here at two levels: first, from language use to competence, and second, from the individual to the organization. We have justified the first level by pointing out that language itself is a competence, and that therefore what occurs in the language domain may work similarly with respect to an individual competence. The second level, that of analogy from the individual to the organization, is supported by the fact that the same language is, by definition, a widespread competence in a group and communal environment. The linguistic phenomenon can in itself be seen both as a competence of a community and as a phenomenon that presupposes the existence of a group within which an individual makes use of a language. Given that language is thus similarly both an individual and organizational competence, we suggest that this parallel offers a fundamental plank to defend the transfer of our analogy between language and CA from the individual to the organizational level.

Toward the Formation of a Competence Attrition Theory

From language attrition to competence attrition

Studies on language attrition have dealt with second language (L2) attrition and more recently with first language (L1) attrition (Bahrick, 1984; Köpke & Schmid, 2004). Schmid (2011) presents in the opening part of his book the case of some German nationals who emigrated to English-speaking countries after the Second World War and who, after more than fifty years, returned to interact with native Germans. Their belief was that they still possessed their German language skills, it being their mother tongue (L1); and they assumed that, even if they would not be as fluent as before, they would still possess an innate and latent competence that could be 'activated' again. By concentrating on the mother tongue again they assumed that they could recover it in full again, but this was in fact not the case. These German-speaking natives had lived in an environment where their original language had not been used. They had thus lost competence

not only through non-use but through their interaction with English as a language and competence in the target country. This interaction had produced an attrition that they directly experienced when they returned to their home country and would, in a more general sense, experience when they would interact again with speakers of their native language. This same phenomenon is, we argue, similarly likely within organizations – and we spell out its contours in the organizational context below.

At the centre of the attrition concept is the relationship between new and old languages which we analogously apply to competences. Acquiring and using a new competence is not neutral to any previous competence, and, unlike what the absorptive capacity construct suggests, the effect is not always simply cumulative (Hansen, 2001). In this respect, the language attrition literature suggests several ideas that can be effectively applied to the organizational context. As Schmid (2011, pp. 13–15) instructively suggests,

> When you begin to learn a new language, you cannot re-initialize your brain: the language(s) you already know will affect the way you learn and use the new one (. . .), however, the new knowledge which you are acquiring may also impact back on the language(s) that you already know, and affect the way in which you use them.

Similar to the example of the German speakers we highlighted above, organizations experiencing competence attrition may have the impression that they can easily recover their unused competence again whenever they want. But, analogous to this example, the problem of competence loss (and of its eventual recovery) is not only – and simply – an issue of reactivation, as the loss itself is the result of, and continues to be affected by, the interaction between competences, namely, between the competence that has been partially lost due to attrition and the one that has been learnt in the meantime. This insight is instructive for thinking about competencies in organizations, where we can differentiate similarly between different conditions of interaction between competences depending on whether they are deeply rooted or newly acquired. A first point of particular importance for our theorizing, therefore, concerns the concept of 'cross-competence influence', in analogy with the concept of 'cross-language influence' at the centre of attrition theory. Transposed to the organizational context, we argue that an already available competence (C1) can influence the process of learning a new one (C2) due to absorptive capacity; but attrition assumes, as we have argued, a bidirectional influence such that it allows us consider the impact that the acquired competence (C2) has in turn on the existing competence (C1). A second aspect of interest is the nature of the cross-competence influence, since this affects various components, including within linguistics elements of the structure and functions with which a competence is used (such as grammar) and which furthermore provides direction to its effective usage (such as lexical choices and semantics). The concept of cross-competence influence is important to underline for organizations, since attrition does not require C1 (or large parts of it) to disappear but entails the occurrence of processes and effects other than a straight substitution. For example, within linguistics, 'Russian speakers often express emotion by means of verbs, while English speakers tend to use adjectives' (Schmid, 2011, p. 36). However, a shift has been observed in native Russian speakers who switched to using English, and on returning to using Russian no longer 'view[ed] emotions as an active process' (Pavlenko, 2002, p. 67). In this case, and similarly within organizations, the impact of C2 affects C1 in a more general way since the pre-existing competence totally or partially moves toward the structure and components that are specific to C2. To recall, the attrition concept does not assume the complete loss of a competence but only a partial loss. While in everyday life this partial loss might be largely inconsequential, in the competitive settings of organizations it might be, depending on what is being 'overwritten' or lost, decisive.

For organizations, a similar phenomenon may occur when, for some reason, it is necessary to return to the use of competences that have not recently been used, nor therefore been exposed to interaction with other competences that have been learnt in the meantime. This 'return' to the use of competences may similarly lead to instances where organizations are convinced that they still possess them, especially when these have long been prominently used by the organization itself in the past (such as a mother tongue or L1). Organizations, like the speakers in Schmid's example, may then be strongly convinced that they still have the competence, but in all likelihood, we surmise, will experience similar unforeseen problems.

Our theorizing is, informed by this analogy with linguistics, functional in form in that we stipulate similar dynamics around cross-competence interactions and the effect of a hypothesized activation threshold around original competences. Because of this form, one may challenge our theorizing by suggesting that it is only or primarily based on an analogy. In response, we offer stylized vignettes (Aguinis & Bradley, 2014; Gherardi, 2009; Hughes & Huby, 2004) alongside each of the theoretical propositions that we develop below. These vignettes add concrete detail to the theoretical arguments that we develop and are meant to ground our arguments in the context of competence attrition within organizations. Specifically, we use three stylized vignettes from the same industry and that all capture instances of organizations experiencing competence attrition. The first vignette involves a textile company which, under the pressure of sustainability, tried to recover an old technology of producing regenerated wool from industrial waste and used clothing. The second vignette is about issues that can emerge in the interaction between old and more recently developed competences in the case of diversification within a fashion company. The third vignette that we consider is about a sports shoe company bringing a previously outsourced part of its manufacturing in-house again.

New competence acquisition and competency-related effects

For starters, one can assume that an individual acquires a first competence and that the acquisition of the second competence then occurs largely in isolation. Clearly, as we have argued, this is not the case; the existing stock of knowledge will influence the way a new competence is learned, which is also, as we have highlighted, a main assumption of the absorptive capacity construct. However, the acquisition of a new competence interacts with existing competences (Köpke, 2004; Pavlenko, 2004), an effect that the absorptive capacity construct has largely neglected, including the many ways in which this interaction might take shape.

But, when we consider this in more detail, how does competence attrition within organizations work? As mentioned, attrition generally alludes to the partial loss of a pre-existing competence in the face of acquiring a new competence. The main factors that drive attrition are the use of a new competence and the interaction effects between competencies (Schmid, 2011). If we assume bounded rationality (Simon, 1991), or a finite amount of attention or memory (Seliger & Vago, 1991), then any capacity to acquire a further competence is itself limited. To acquire a new competence, the organization will generally invest more time and resources in that particular competence, and thus, *ceteris paribus*, invest less in existing competences (Seliger & Vago, 1991). The subsequent lesser use of these older competences, if prolonged, will over time reduce the level of competence in enacting that knowledge. Even if the structures and processes underlying this competence are somehow preserved (e.g. in manuals, records, databases, etc.), reduced performance in using the original competence is likely (Aitchison, 1991) and, depending on the case, this attrition process may be more or less rapid.

What increases the attrition of an existing competence? As already noted, a first main determinant is the use of the competence itself (Schmid, 2011) whereby the less the existing

competence is used, the higher the attrition effects over time. This might, for example, be the case for outsourced activities, and which, in the long run, may affect the capacity of the organization to continue to integrate such knowledge (Lechner et al., 2020). But as we mentioned, it is not just the absence of using a competence. Interaction effects between competences cannot be overlooked (Pavlenko, 2004) and in fact concern both competence acquisition and attrition simultaneously (Pallier, 2007), which we call cross-competence influence. That is, the increased efforts in acquiring and then accessing the new competence will increase the potential interaction effects between the two competences (Schmid, 2011). Accordingly, and when there are such strong interactions between competencies, the process may foster the acquisition of a new competence as well as importantly competence attrition. Thus, summarizing our arguments so far, our first proposition states:

> *The higher the interaction between two competences, the more likely is competence attrition.*

This proposition captures the fact that, first, the key to understanding competence attrition (CA) is the interaction effects between existing competencies and the to-be-acquired competencies. Second, learning requires effort, and given that old and new competencies compete for a finite amount of memory and attention (Seliger & Vago, 1991), the amount of effort required offers insights into CA.

We briefly illustrate this proposition with a vignette of textile companies trying to recover an older technology for regenerating wool from industrial waste, especially from used clothing (Guercini & Runfola, 2021). The old competence had been in use for decades until the 1980s. It had involved recovering and tracing all the natural fibres leading, however, to imprecise labelling for the new garment (e.g. '90% wool, 10% other fibers'). Regulatory changes requiring exact labelling of the materials and further technical changes fostering the use of chemical fibrers had made this traditional process less appropriate and had shifted companies towards new competencies. These new competencies involved using chemicals to dissolve some fibres and only trace (partially) the dominant fibres used in the product. The interaction between these older and newer certification competencies was particularly intense for products where mixed fibres were present. Specifically, many textile companies – after a series of experiments of re-implementing the old system – realized that recovering the old competence was not automatic. The newly acquired competence in chemical processes that was required for certification had redefined the scope of the older regeneration skills, which came to be used for the remanufacturing of pure, high-value fibres, and for a different purpose (i.e. for the recovery of a smaller percentage of fibres).

Similar competences and competence attrition

What factors drive the interaction between competencies and their effects? First, we argue that the degree of similarity of a new competence with an existing competence increases their interaction effects (Schmid & Köpke, 2007). The more similar two competences, the easier it is to find plausible (although not necessarily valid) associations between elements of one competence and the other. Learning will be associative in nature (Kruglanski & Gigerenzer, 2011), whereby the more similar the new competence, the more 'gaps' will be rapidly filled with components of C1, and the more 'false friends'[2] will enter into assimilating C2 as well. What this process suggests is that, first of all, acquiring the new competence is heavily influenced by the existing competence: there is interaction between the two competences. Second, the habitual use of associations will make the 'learning' almost effortless such that this perceived ease may in turn reduce the willingness to further increase efforts to learn, and to potentially learn differently or more deeply as well.

Indeed, the more similar the two competencies are, we hypothesize, the lower the general motivation to learn (Schmid, 2011). Such a motivation to learn is necessary to activate further learning processes: the activation threshold hypothesis states that a minimum of information and stimuli needs to be reached for learning to take place (Paradis, 2007). Thus, the impression that acquiring C2 is easy reduces the motivation to truly acquire C2 (consider an Italian speaking Spanish). As such, acquiring a very similar C2 may affect its basic mastery (through the use of associations). Indeed, given the interaction effects and the activation threshold, it is very unlikely, we argue, that the new competence will be acquired with proficiency as this would require further deliberate learning efforts.

In comparison, a competence that is initially dissimilar must be acquired through learning efforts since interactions with the existing competencies and the possible use of associations are reduced. Efforts towards learning, in this case, are more likely to be perceived as rewarding and in turn, may further increase the motivation to learn as part of such a more strenuous effort (Ma & Klinger, 2000). Thus, given the degree of similarity between new and old competencies, we formulate our second proposition as follows:

> *The higher the degree of similarity between two competences, the higher the initial acquisition effects, but the lower the probability of effective competence acquisition.*

Thus, when the similarity between competencies is higher, the potential of full and effective competence acquisition decreases. This line of reasoning contrasts with what the absorptive capacity construct predicts. Our second vignette illustrates this proposition and involves a fashion company that had specialized in women's fashion diversifying into the different related industry of male fashion. The idea was to integrate the design of men's fashion using the existing design competencies and to make the product using its existing suppliers. While the shift from women to men's clothing may not suggest a radical innovation on paper, it turned out to be a very challenging journey for the company involved (Guercini, 2008). When the design department started to work on the design of men's fashion and the specifications for production, their activities were strongly influenced by their design expertise in fashion for women. Designers reported that they were confused about what to design. The most difficult was the translation from design to production specifications. This difficulty of shifting between the two is also reflected in the industry at large, where the design, pattern making and textile manufacturing to clothing manufacturing is generally separated between women's and men's fashion (Guercini, 2004). The increasing difficulties of moving back and forth between women's and men's fashion with unsatisfactory results finally led the company to halt the diversification completely and to outsource this activity by just licensing the brand to specialized designers and producers in male fashion.

Cognitive proximity or distance has, as in this case, a bearing on competence acquisition. On the one hand, in the case of high competence similarity, both the activation threshold and the interaction effects inhibit learning. The assumed similarity between male and female fashion hindered the case company in fully acquiring a new set of bespoke competencies in line with the intended diversification. On the other hand, the lowest interaction effects occur between distant competencies. However, learning a new competence in such instances – while possible – would require maximum effort. As the amount of organizational effort is limited for new competence acquisition, organizations must therefore decide how to allocate the effort.

Behavioural theory generally suggests that competitively rewarding opportunities are found in distant search (Gavetti, 2012). To us, this argument comes down to realizing that interaction effects decrease with distance while the required effort for learning increases. This trade-off gives organizations different options: for example, they may invest in a relatively high number of moderately distant and thus moderately novel competencies that circumvent the

activation threshold because they come with a basic learning effort that limits the potential for competence attrition. Alternatively, organizations may decide to put maximum effort into a limited set of distant and highly novel competencies through deliberate learning. These choices are underpinned, we suggest, by three factors: (1) the activation threshold; (2) the learning effort that is required; and (3) the possibility of competence attrition. More formally, we interject that the learnable competence space for new competencies begins after the activation threshold is passed; meaning that the amount of new competencies to be effectively acquired is defined by the trade-off between competence attrition and required effort for learning. In contrast to the absorptive capacity construct, the learnable space only starts at a certain amount of competence dissimilarity and not at the point of a maximum overlap between competencies. This argument leads to our third proposition:

> *The effective acquisition of new competencies is positively influenced by the diminishing likelihood of interaction effects and – at the same time – by the increasing learning effort that is associated with their difference (distance) from prior competencies.*

The third vignette highlights how the recovery of old competencies can benefit from isolation from subsequently acquired competencies. This vignette concerns the reshoring attempt of an Italian sports shoe firm aiming to produce and brand some of its historic sports shoes as streetwear (Lechner, et al., 2020). Common with industry norms, the firm kept design and prototyping in-house. However, personnel working in their prototyping laboratory struggled to produce the shoes based on the old design specifications (i.e. the new competence interacting with a now lacking previous or older competence). When the firm attempted to re-hire retired personnel who had produced the original version to help younger colleagues reproduce the historic shoes in the laboratory, this initially failed as well with different ideas and approaches not coming together. In the end, the firm managed to recover the old shop floor competence with the original machines and was able to reproduce the original shoes with the re-hired personnel but in isolation from younger personnel to shield the original competencies. And it was only after the successful re-introduction of the original shoes as streetwear that the former retired employees were able to start training new, specifically hired personnel on the old machines (i.e. deliberate learning of old competence).

Robustness of competences and competence attrition

Another aspect that feeds into our theorizing concerns the robustness or entrenchment of a prior competence. The frequent repetition or application of a competence can lead to robust organizational routines and conventionalized procedural knowledge (Nelson & Winter, 1982). Overall, the more recent the acquisition (i.e. the newer the competence), the stronger or more extreme the attrition process (Pallier, 2007), and the older a competence – often with the side effect of being procedural, leading to routines (Ullman, 2001) – the lower the potential for attrition effects. This is the case because the likelihood of attrition depends not only on the pressure coming from the new competence, but also on the robustness associated with the older competence's entrenchment as part of organizational routines. In fact, within linguistics, the mother tongue (L1) is considered to be robust not only because of the number of years since it was acquired, but also because it was the first language, and therefore has deeper roots in the cognitive structure and competences of those who have learned it. This pattern can analogously be seen in organizational core capabilities that are hard-wired and difficult to change in organizations (Leonard-Barton, 1992). This insight around the robustness of competencies leads to a further novel insight, give that absorptive capacity theory treats any stock of knowledge as independent of when and to what extent the 'in-flow' or 'establishment' occurred. Hence, we have a temporal argument as the basis for our fourth proposition:

Table 1. Competence Attrition as a Cross-Competence Interaction Theory: Problems and Propositions.

Theoretical problem		Proposition
Cross-competence interaction	Learning vs accessing	The higher the interaction between two competences, the more likely is competence attrition.
	Similarity	The higher the degree of similarity between two competences, the higher the initial acquisition effects, but the lower the probability of effective competence acquisition.
	More vs less interaction and distance	The effective acquisition of new competencies is positively influenced by the diminishing likelihood of interaction effects and – at the same time – by the increasing learning effort that is associated with their difference (distance) from prior competencies.
	More vs less recent	The attrition effect is more likely for more recently acquired competences; the time since acquisition is to be considered in relative terms with respect to that of other competences.
	Synthetic statement	The generally positive relation between existing competences and new competence acquisition is contrasted by competence attrition. Competence attrition is specific to the relation between competences, suggesting a more complex interplay between the conditions and processes in acquiring external competences.

The attrition effect is more likely for more recently acquired competences; the time since acquisition is to be considered in relative terms with respect to that of other competences.

Competence acquisition mechanisms

With these theoretical propositions we augment previous research on the assumed positive relation between existing competences and new competence acquisition by highlighting the very real phenomenon of competence attrition. One of the shortcomings of the absorptive capacity construct which has dominated the management and organizational literature is the focus on the positive effects of competence acquisition without any significant consideration of the potential negative attrition effects. While these are two sides of the same coin, as we have argued, absorptive capacity only considers one side. Indeed, competencies interact with each other, are subject to memory dynamics, and their emergence often follows, as we have argued, a particular path-dependent trajectory. This complex process has been theoretically linked to the 'path dependency' concept (Arthur, 1989), well-illustrated in the case of the QWERTY keyboard (David, 1985; Liebowitz & Margolis, 1995). Dierickx and Cool (1989, p. 1506) furthermore describe this path-dependent process with the bathtub example of competence stocks and flows,

> At any moment in time, the stock of water is indicated by the level of water in the tub; it is the cumulative result of flows of water into the tub (through the tap) and out of it (through a leak)'.

Staying with this metaphor, absorptive capacity focuses on the tap, while our focus on competence attrition highlights the possibility and amount of leakage.

We advance these propositions as broad statements covering new theoretical ground (Cornelissen, 2017). They are not intended as hypotheses in the strict sense, but as a synthesis of the analogical reasoning proposed. Table 1 summarizes our propositions. In the next section, we discuss the implications for theory by relating the CA concept to the absorptive capacity construct and spell out a number of directions for further research.

Table 2. Comparing the Predictions from Absorptive Capacity Theory with Competence Attrition.

Absorptive capacity effects	Competence attrition effects
Existing competences have a positive effect on acquiring a new competence.	Acquiring a new competence has a negative effect on existing competences.
C1 → C2 (positive effect)	C1 ← C2 (negative effect)
More recently acquired competences have a positive effect on acquiring a new competence.	Acquiring a new competence has the most negative effect on more recently acquired competences.
$C1_{(recently\ acquired)} \rightarrow C2$ (positive effect)	$C1_{(recently\ acquired)} \leftarrow C2$ (negative effect)
The similarity of existing competences with the new competence to be acquired has a positive effect on acquiring a new competence.	The similarity of existing competences with the new competence to be acquired negatively moderates the positive effects of absorptive capacity.
$C1_{(similar)} \rightarrow C2$ (positive effect)	$C1_{(similar)} \rightarrow C2$ (negative effect)
Complete acquisition of the new competence is likely.	Complete acquisition of the new competence is unlikely.
Innovation is the outcome of extending existing competences or developing new competences.	Innovation can be the outcome of the incomplete acquisition of a new competence when borrowing from existing competences in a coincidental process (or vice versa).

Discussion

In this article, we have formulated a set of propositions on competence attrition (CA) drawn from analogies with linguistics. We have also compared this formulation with absorptive capacity theory since both insist on the relationship between pre-existing competences and any new competences subsequently learned. Here, we briefly discuss the contributions of our theorizing and outline a number of directions for further research.

Theoretical implications

Comparing CA to absorptive capacity offers a new theoretical perspective. Absorptive capacity is 'the ability to evaluate and utilize outside knowledge' (Cohen & Levinthal, 1990, p. 128), and if we consider knowledge as an underlying element of competence, we can integrate the views of absorptive capacity into our formulation of CA. Table 2 compares the traditional predictions of absorptive capacity theory with the modified predictions deriving from our proposed CA theory. We propose that CA can be seen as a roomier framework that integrates absorptive capacity. CA does not oppose the importance of internal knowledge in acquiring external knowledge, but rather challenges the simplistic assumption of cumulative learning processes. In this sense, CA adds a new perspective on the cumulative process of competencies, accommodating yet extending what the absorptive capacity concept proposes.

The absorptive capacity construct assumes a positive relationship between competencies already available and what can be learned. The greater the availability of a competence at time t1 (C1) and its 'similarity' to that to be developed or learned, the greater the possibility of favourably evaluating and utilizing the external knowledge to be acquired at time t2 (C2) not yet owned by the organization at time t1.

The CA concept that we have proposed and developed in this paper has a different inner logic. First, from this perspective, the relatedness of a competence may reduce, as we have argued, its full-scale acquisition potential, thus negatively moderating the absorptive capacity–competence acquisition relationship. Attrition suggests an alternative, reverse path. But what effect does the new competence developed or new knowledge learned have on the original? We have argued that the attrition effect occurs when a new competence

acquired at time t2 (C2) leads to a 'forgetting' of the competence previously available at time t2 (C1). Moreover, the positive effect of more recently acquired internalized competences on the acquisition of new external competences as suggested by the absorptive capacity construct may still apply. However, and in line with our robustness-related arguments, there may still be negative attrition effects given that those recently acquired competences are less robust. Table 2 summarizes how the CA perspective modifies the absorptive capacity perspective.

Grasping the CA phenomenon requires, as we have argued, a sound understanding of competence acquisition in the presence of other competences, since the two concepts are interrelated (Pallier, 2007). Essentially, the concept of competence acquisition generally assumes positive effects, whereas the concept of attrition assumes negative effects. Absorptive capacity theory in particular argues that the existing stock of competences facilitates competence acquisition. The underlying and implicit assumption is that an associative learning style increases the acquisition of a further competence. Indeed, we can assume in many instances that a previous related competence increases the speed of competence acquisition, in line with absorptive capacity research.

However, the activation threshold hypothesis that we formulated suggests that a similar competence might at the same time be only rudimentarily acquired since the motivation to learn the new competence is minimal – and does not pass a specific threshold for learning (Paradis, 1993). Absorptive capacity appears to be high in the case of similar competencies through associative learning. However, such associative learning does not usually lead to profoundly new competencies and may even impede the full acquisition of a new competence for which slow and deliberate learning is required (Kruglanski & Gigerenzer, 2011). Furthermore, in the case of similar competencies, the negative interaction effects are, as we have stipulated, highest, while for absorptive capacity, such cases appear to be the most conducive to knowledge integration. CA is about the partial loss of competence and although we yet lack empirical support for our predictions, we can at least state that CA negatively moderates the effects proposed by absorptive capacity theory. From this perspective, one argument could be that CA can be incorporated into absorptive capacity theory as a useful moderator of new competence acquisition. Another view, and one that is, in our opinion, more helpful, is that CA is a concept that is separate from absorptive capacity, and where both feature as concepts that are helpful to study competence acquisition processes and how their outcomes – both positive and negative – depend on a more exact specification of the interdependencies between prior competencies and any newly acquired ones.

Implications for further research

First of all, the CA concept casts doubt on the simplistic view that effective competence acquisition is the result of the accumulation of competencies and their overlap. As such, the very notion of absorptive capacity appears to be unfavourable to learning, and the construct furthermore ignores, as we have argued, that the mastery of a new competence is affected by cross-competence influence. Future research may therefore, helpfully, extend the propositions that we have offered into further research. Such studies may for example translate our propositions into testable hypotheses and matching research designs, testing and verifying the currency of our main arguments. In addition, future work may further elaborate our basic propositions into additional theoretical and empirical research – expanding our main arguments into a supplementary set of theoretical qualifications. For example, studies may augment our basic propositions into a more qualified account of when and how competence attrition occurs, when we consider the kinds of competencies (complementary or supplementary) involved (Buckley et al., 2009, p. 602) or their life cycles. Helfat and Peteraf (2003) for example suggested the existence of

competence life cycles in which different stages can be recognized: the founding stage in which the competence is established; the development stage in which it develops and achieves effectiveness; and the maturity stage in which the competence ceases to be further developed. These life cycles may have some bearing on the robustness of competencies, in the way we have formulated our main propositions and may therefore potentially impact the form and severity of attrition effects. We believe that future work may helpfully augment and extend our proposed theory around competence interdependencies in ways that further capture the type and timing of competencies and the effects that these might additionally have on competence attrition.

A future main direction for research would be to study the different types of learning processes that we have argued underlie competence acquisition and attrition, including in instances where the competencies that are compared are quite distant (at least initially) from one another. Yet, to date, we have little detailed insight into the actual learning processes constituting the behavioural processes leading to effective competence acquisition (Argote & Miron-Spektor, 2011). This is the case as learning is often assumed rather than directly studied, and is theorized, similar to what we have done here, in rather stylized terms (as associative learning, deliberate learning, etc.). Likewise, there are some basic concepts such as unlearning and forgetting (Tsang & Zahra, 2008) that capture the possibility of competence attrition, but these concepts stay similarly stylized. We believe that research may further unpack the constituent processes that make up different learning styles and how these might variably play a role in the acquisition of competencies (De Houwer, 2009). Such studies of learning processes may then extend beyond the level of individual organizations or firms to an entire community, field or industry as well, as in our examples from the fashion industry, studying whether learning and attrition processes happen similarly across organizations in specific settings.

Concluding comments

In this paper, we have formulated a competence attrition perspective on the acquisition of new competencies. Informed by linguistics, we offer several high-level theoretical propositions regarding the interaction of competences as part of this acquisition process. This formulation extends and augments prior research on this topic from the perspective of absorptive capacity theory. It not only adds important moderating effects to some of the predictions of prior theory but also challenges its main theoretical assumptions and points the way towards a more encompassing modelling of both the positive and negative impacts of new competence acquisition for organizations. We hope that with this formulation we inspire future studies on the important but neglected concept of competence attrition.

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Notes

1. The construct of absorptive capacity has since its inception been subject to revisions. Notably, Zahra and George (2002) identified ambiguities in the definition and raised important questions about the antecedents, components, contingencies and outcomes of the construct. The ambiguities in the definition of the construct have led, they argued, to imprecise or varying applications (Camisón & Forés, 2010), such as, for example, scholars in the field of economic development using the term without providing a definition (Glass & Saggi, 1998; Keller, 1996), or interpreting it in a broad sense as the firm's receptivity to technological change (Kedia & Bhagat, 1988).
2. A word in one language that is similar in form or sound to a word in another language but has a different meaning and may or may not be etymologically related.

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