
Combinations and Connections: Reaching Across Disciplinary Boundaries

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The data-rich articles in this special issue invite readers to consider how grammar and multimodality enact social practices. In particular, they propose a reconceptualization of grammar, moving beyond an autonomous system of items and combinatorial rules to demonstrate how grammar is an embodied resource for social interaction. In this discussion, I build on this important reconceptualization of grammar in order to identify cross-cutting themes—themes that result from combining research methodologies and connecting the research reported on here with that originating from other disciplines, especially that inspired by complex dynamic systems theory. My intention is to urge all researchers not only to pursue their own research agendas but also to build on existing common ground, in order to overcome fractionalization and to contribute to our mutual understanding.

Keywords: connections; complex systems; social interaction; longitudinal; synchronization; emergence; affordance; context; adaptation; relational

AS I READ THROUGH THE ARTICLES IN THIS special issue, I was struck by the correspondence between themes in these research articles and those commonly used in the study of complex systems, a study to which I myself have been committed for 25 years. My co-authored book on complex systems and applied linguistics (Larsen-Freeman & Cameron, 2008) ended with a call for researchers to blend methodologies (Mason, 2002) in order to study second language (L2) development. In particular, we recommended combining methodologies that would focus simultaneously on different levels of granularity (in learners' performance) and at different timescales.

One of the combinations that we thought held promise was joining a fine-grained conversation analysis (CA) perspective on interaction—CA offers a rich description of “the most basic site of organized activity where learning can take place” (Mondada & Pekarek Doehler, 2004, p. 502)—with a longitudinal view of language development. We reasoned that if these descriptions were

to be done with a sufficient density over time so that retrospective microanalytic techniques could be applied, it would offer a very useful perspective, connecting single episodes of language used in social practices to its dynamic over-time development.

Happily, this special issue of the journal contains several articles that make use of this combination. Other combinations in the issue are on display as well, such as one between a usage-based approach and CA, both undertaken in the crucible of social interaction. Another is the bringing together of CA and interactional linguistics. Besides these methodological combinations, other connections were made—an important one being between language use and language learning. Also mentioned was the potential for the convergence of language use and language change.

In my International Association of Applied Linguistics (AILA) keynote address (August 2021), I encouraged such combinations and connections for the purpose of reducing the fractional thinking in the field of L2 development, which I had increasingly witnessed. My major contention was that if we continued to participate solely in isolated scholarly communities, we limited the potential for our collective agency to contribute to

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mutual understanding. I further proposed that reducing fractionalism and discipline insularity was key to meeting the challenges that confront us today—both within our field and in the world outside.

To be clear, on its own, CA remains valuable for its emic approach to identifying interactional features in context—a contribution that one should not lose sight of. Nevertheless, I argued that the success of future scholarship lies not only in refining separate research traditions, but rather in acknowledging and building on common ground among them (Byrne & Callaghan, 2014). Doing so would advance an inquiry-driven approach, one that takes as central a problem or inquiry, not one restricted by disciplinary (or methodological) boundaries (Morin, 2008).

In forging connections, we could take advantage of a broader array of perspectives and methods that may act as correctives, or at least challenges, to our understanding of L2 development. I had in mind, for example, Eskildsen (2012), who drew on a combination of CA and usage-based linguistics to study Spanish-speaking participant Valerio's use of English negative constructions. Valerio used negative constructions to accomplish locally contextualized interactional goals in a way that departed from well-established developmental sequences in English. Importantly, Eskildsen's report called attested developmental sequences into question.

Beyond their use to challenge the status quo, these combinations and connections all hold great promise for our collective efforts to better understand language use, learning, teaching, change, and development and to apply this understanding to language problems in the real world (Larsen-Freeman, 2018), the rightful pursuit of applied linguistics.¹

DISCUSSION OF THE ARTICLES

Let me now turn to the articles, highlighting one or more themes in each. Following this eise-gesis, I will point out some connections that can be made, for I define my role as a discussant here as offering ways that the present authors might forge connections with others whose explorations and discoveries lead them to similar places. Most, although not all, of my remarks will come from the perspective of complex dynamic systems theory (CDST); however, they are offered not in a move to stake out and defend scholarly turf or to redress perceived omissions in attribution but rather as a means of contributing to and learning from others. For this reason, I will begin by saying

what I have appreciated and learned from each article. Following this, I will point to connections that might be made. The articles in this special issue are data-rich, and I can do no more than call attention to places where there is resonance that might propel both CA and CDST further when it comes to investigations of second language development.

Pekarek Doehler and Skogmyr Marian

In a commentary published in a special issue of *The Modern Language Journal* edited by Numa Markee and Gaby Kasper (2004), I wrote then that I was optimistic about the prospect of linking CA with second language acquisition (SLA)—but that it 'all depends' (Larsen-Freeman, 2004). It depended on CA researchers adopting a more diachronic approach to investigate the learning of social practices (Hall, 2004; Larsen-Freeman, 2004). In their present contribution to this special issue, it seems to me that Pekarek Doehler and Skogmyr Marian (2022, this issue) have met this challenge. An important decision they made was to have the focus of their research emerge from the data, not from a preordained linguistic category. Indeed, they told us that contrary to preceding by tracking a linguistic form over time, their study started from a precise action context—that is, word searches—where they were able to identify and focus on the recurrent and changing use of a multiword expression or construction in that context—namely, *comment on dit* [how do you say]?

Not only were the researchers able to trace changes in French learner Malia's developmental trajectory of the construction over a 15-month period but they were also able to trace its multimodal realization. Significantly, Malia's use of *comment on dit* followed an increasingly diversified path from its initial literal sense (a request for translation) to more routinized interactional-organizational uses (to hold the floor and to initiate self-correction). This finding supported Pekarek Doehler and Skogmyr Marian's assertion that grammar is a resource for social interaction and hence part of interactional competence.

In keeping with my self-ascribed role, I suggest that one way that the authors might make connections with others is by crossing disciplinary boundaries to consult the work of anthropologist Lévi-Strauss (1960) and his concept of *bricolage*—using available materials in order to solve new problems—or that of biologists' *degeneracy*—using the same parts for different functions. What do seemingly parallel concepts as bricolage and

degeneracy contribute to our understanding of language development?

The authors might also connect with the field of nativization—to work by researcher Roger Andersen (1984) and his 1-to-1 principle: “The One to One Principle of interlanguage construction specifies that an interlanguage system should be constructed in such a way that an intended underlying meaning is expressed with one clear invariant surface form or construction” (p. 77). After continuous exposure to and use of the language, the one form is extended to more instances of use. I realize that the explanandum between these two research agendas is different; nevertheless, there is overlap between Andersen’s principle and Pekarek Doehler and Skogmyr Marian’s observation that *comment on dit* is used in its literal sense initially and later diversified in its function.

Another reason to cite Andersen’s (1984) principle in light of this present work is the bid he made to treat the learner’s system as a system and not simply to examine separate pieces of the system: “I propose that the 1:1 Principle guides the learner in constructing an internally consistent IL [interlanguage] system and in maintaining its internal consistency as it develops over time” (p. 79).

Andersen’s bid aligns well with CDST, because CDST is a systems theory. From a systems perspective, we would want to know how Malia’s use of *comment on dit* compares with other constructions that accomplish the same social actions. Of course, in Malia’s case, *comment on dit* may fill this niche uniquely; however, in a future study, we would want to know at what point she recruits or creates other constructions to fulfill the same social functions. And, we would want to know what motivates Malia to choose one form over the other in order to fulfill a particular function on a particular occasion in a particular context. In other words, the authors have done a fine job of identifying a recurrent construction and tracing its functional diversity. To expand upon their work from a systems perspective would entail the converse: identifying particular functions, such as holding the floor and signaling a self-correction, and tracing the increasing diversity of forms—including, but not limited to, *comment on dit*. In addition, in keeping with the significance accorded variability in CDST, it would be helpful to report the variability in Malia’s performance in order to reveal how it influences the system’s dynamics (Evans & Larsen-Freeman, 2020; Lowie & Verspoor, 2015).

In short, a request I would make of the authors—which would help them forge connections with others—is to address how the construc-

tion *comment on dit* fits into the learner’s developing French system and hence becomes integrated into her interactional competence.

Greer and Nanbu

Greer and Nanbu (2022, this issue) offer a fascinating account of gestures used by L2 speakers—not by studying iconic gestures, as is often the case, but rather by examining gestures that correspond with written forms of a turn-in-progress to make grammar a “shared object of visualization” (p. 70, this issue), as the authors say. I am grateful that Greer and Nanbu have gone beyond platitudes concerning multimodal interactional practices and have done the hard work of investigating them. In addition, I have highlighted, and will give further thought to, the implications of their proposal that “such environmentally coupled gestures thus become part of a laminated action that seamlessly comprises talk, space, bodily movement, gaze, and the like—and this may ultimately become the medium through which learning takes place” (p. 71, this issue).

The speakers’ shared object of visualization facilitates what Mushin & Pekarek Doehler (2021) called *social coordination*, which “requires the real time, mutually adaptive and highly situated ways in which participants synchronize their conduct” (pp. 8–9). Synchronization easily connects to CDST because synchronization enjoys a special place in complex systems. CDST is an ecological theory, which highlights the universal tendency of humans and other organisms to synchronize their behavior in a context (Strogatz, 2003). Synchronization is a form of spontaneous pattern formation that operates according to general principles of self-organization described by nonlinear dynamics (Oullier et al., 2008).

Of course, what is usually studied is the ability of humans to synchronize their physical actions, such as when two individuals adopt a similar posture. However, in Greer and Nanbu’s study, we do not detect any overt mimicking of gestures between interlocutors. The authors explain that “in terms of L2 learning, these practices seem to represent outward manifestations of internal cognitive processing” (p. 83, this issue). In keeping with Greer and Nanbu’s point, complexivists speak of one type of internal “phase synchronization,” in which different areas of the brain synchronize in order to share and to integrate information. Some complexity researchers would extend this position to accommodate synchronization among neural areas of multiple brains in

real time—interbrain synchronization (Valencia & Froese, 2020)—making a case for the neural basis for social interaction.

Attention has also been given to the linguistic coordination that occurs between interlocutors in dialogue (Fusaroli & Tuyen, 2014). By applying a dynamical model of motor coordination to describe the unfolding of conversational perspective-taking, Duran & Dale (2014) have illustrated how low-level coordinative processes ground higher level social and cognitive processes, taking the interaction, rather than the individuals, as the appropriate level of analysis, a point that Hellermann and Thorne (2022, this issue) also make, and a point that I shall return to later.

However, a caveat to all this is that the ability of speakers to synchronize depends in part on the individual(s) with whom they interact. As I have argued (Larsen-Freeman, 2020), in a coupled system, individuals do not function independently in their interaction since each co-adapts in response to the other—continuously, linguistically, physically, affectively, and ideationally as the interaction proceeds. Indeed, communicating and learning from others or distancing from them involve relational thinking—understanding the speaker as well as the message.

This caveat applies, too, to Greer and Nanbu's speculation that it is likely that a learner's reliance on embodied resources lessens over time. This seems a reasonable inference, although as they say, support should be sought by conducting longitudinal studies. In addition, from a CDST perspective, I would say that the extent to which gestures are used is at least partially interlocutor- and context-dependent. So, while the focus in CA is on the interaction, the influence of the particular messenger and context cannot be overlooked.

Hellermann and Thorne

Hellermann and Thorne studied three students walking together through an urban environment, playing a mobile AR game to find specified locations and to make a report on them. The authors demonstrate how language learning can be enhanced through the use of mobile AR, contributing importantly to our understanding of how learning can take place outside of the usual classroom context.

Their study links with Greer and Nanbu's (2022, this issue) in that Hellermann and Thorne write of "interbodied" cooperative practices, which they characterize as synchronized or sequentially mirrored body-to-body practices. In

this discussion, I have already stressed the importance of synchronization in complex systems and of interactional practices as the focus of the investigation. They also note how the speakers orient to the immediately local physical environment, which brings to mind Atkinson et al.'s (2007) concept of alignment, as alignment includes not only face-to-face interaction, but also alignment with the materiality of the extended context.²

There are a number of other connections as well.³ One is a link that Hellermann and Thorne have made between the rewilding of language-learning experiences and the rewilding of nature. The latter initiative introduces fauna and flora into environments in order to increase the biodiversity at a particular location, and the authors propose that rewilding language learning experiences might have the same salutatory effect. The connection is that I also drew on the link between language development and the environment in my AILA address, although I made a suggestion in the opposite direction—that is, we might look to language issues, such as language revitalization, to deal with the environmental challenges that confront us. Both directions illustrate the crossdisciplinary connections that I believe are so important.

The unplanned need for the students to produce three versions of their report allowed the researchers to examine the impact of task repetition. Much has been written of late concerning task repetition (see, e.g., Bygate, 2018). From a complex systems point of view, however, it is not repetition but rather iteration (which Hellermann and Thorne also mention) that propels language development and the emergence of grammar for social action (Larsen-Freeman, 2012).

This accords with perhaps the most foundational tenet of CDST, that of emergence.⁴ From a CDST perspective, emergence refers to the coming of something new, something that might not have been anticipated by antecedent influences. In their study, it is the collaborative and embodied process that Hellermann and Thorne credit for the emergence of a particular academic genre—namely, that of an oral report. This is totally in keeping with a CDST perspective, which points to the self-organization of emergent structure in an open system.

One especially interesting issue that Hellermann and Thorne raise is to point out that "the focus of SLA, and of assessment of learning more broadly, remain[s] oriented toward individuals as the primary unit of analysis" (p. 107, this issue). While acknowledging that an individualistic orientation can be useful, they call for seeking

evidence of growth in the joint work of the participants. Further, they state that, due to the semipermeable nature of communicative repertoires, it was sometimes difficult in their data to separate individuals' productions from those of the group. They advise that researchers need to come up with ways of studying the interactional practices of groups over time. I imagine that this would be an intriguing and worthwhile pursuit.

It also reminds me of McNamara and Roever's (2006) contention that a psychometrically good language test is not necessarily a socially good test, and among other social dimensions, McNamara and Roever identified the need to assess learners on the way that they use language(s) in social settings. They acknowledged,

while psychology, linguistics and psychometrics assume that it is possible to read off underlying individual cognitive abilities from the data of performance, Conversation Analysis sees the performance as a dance in which it is difficult to isolate the contributions of the individual dance partners. (Roever & McNamara, 2006, p. 252)

CDST researchers have studied both levels—individuals and groups. Importantly, we have established that findings from one level do not reflect the other. A significant finding from CDST's studies of individuals is that learners' individual nonlinear developmental trajectories are unique and that, therefore, one cannot infer the performance of the individual from the average performance of the group. However,

traditional models usually assume that behavior is stable, and therefore they ignore the influence of context, focusing instead on averages to reveal 'true' behavior (or ability or knowledge) (...) In contrast, the dynamic systems perspective assumes that context matters, and seeks to identify patterns within the person–context interaction. (Rose, Rouhani, & Fischer, 2013, p. 155)

Clearly, it makes sense when one is studying interactional practices, especially when it is not even possible to determine a particular individual's contribution, to study supraindividual effects. As I say, I think that this is an interesting and valid point; however, to be clear, it depends on what one's research questions are.

Theodórsdóttir and Eskildsen

Theodórsdóttir and Eskildsen (2022, this issue) trace the learning and use of the Icelandic auxiliary verb *ætla* in one individual's learning of Icelandic in the wild over a 3-year period. The learner, Anna, originally learned to use *ætla* in ser-

vice encounters. What was of special interest to me was that Anna's ability to use *ætla* did not transfer to other relevant environments. I have written of "transformation, not transfer" (Larsen–Freeman, 2013) to make the point that in complex systems, such as learners' linguistic repertoires, transfer of a given construction does not take place automatically, but rather is adapted to changing contexts. This is what Pekarek Doehler and Skogmyr Marian (2022, this issue) similarly note: "Longitudinal research on L2 interactions shows that L2 interactional competence is not simply 'transferred' from the first language, but it is recalibrated, readapted in the L2" (p. 24, this issue).

The CDST position would be even stronger, and claim that the re-adaptation is true not only of L1 transfer to an L2 environment but also even within the L2 environment itself, as in Anna's case where she moves from one encounter to the next. In fact, a construction in use is always transformed—even if only in pronunciation—as the context changes. Theodórsdóttir and Eskildsen's study is important in providing evidence for this claim.

Theodórsdóttir and Eskildsen go on to note that constructions themselves are "ultimately sediments of experience" (p. 63, this issue). I realize that *sedimentation* is Paul Hopper's term, but I don't find the metaphor particularly apt. It conjures up sedimentary rocks with immutable layers being laid down in linear fashion. In contrast, a truly emergent language is always open to innovation, "always coming into being" as Hopper (1987, p. 148) himself wrote (see also Kretzschmar, 2015).

I emphasized this point by coining the term *grammaring* to indicate a complex grammatical system that is always in process and open to innovation. Of course, there is stability in the system, which makes possible mutually intelligibility. In a complex system, innovations emerge bottom up through the interaction of heterogeneous agents. The upward emergence of novel patterns is constrained by downward causation, in which the language-using patterns entrain further emergent patterns due to the historic trajectory of the system (its path dependency) and its present sociocultural use. The cycle is known as reciprocal or circular causality, a characteristic of self-organizing systems (Larsen–Freeman & Cameron, 2008), allowing for both innovation and stability in the system.

This fits with Theodórsdóttir and Eskildsen's position that speakers' communicative repertoires are characterized by varying levels of abstraction. Developing a repertoire of

constructions with varying levels of abstraction is especially likely to be the case in learning in the wild with all its diversity and lack of pedagogical interventions. Furthermore, Anna's several inter-related developmental trajectories encourage us to see her developing interactional competence as a natural network of increasing versatility both of function and of form, rather than a linear progression based on formal accuracy alone. From a CDST perspective, this is consonant with the network metaphor used to describe complex systems, which Israel (1996) employed in his description of a grammatical construction: "a massive and highly redundant network of related usages represented at multiple levels of schematicity" (p. 20).

Hall

Hall (2022, this issue) observes that teachers' questions are prevalent in classroom instruction, yet little is known about the social action that they elicit. In her study, more *etic* than *emic*, 4 hours of video recordings in an English-as-an-L2 class were examined for questions posed by the teacher. Hall's analysis revealed the diversity of the teacher's questions—questions that do not simply ask students to display their knowledge—a criticism of teachers' questions that has often been alleged. Hall reports that the majority of the teacher's questions sought specifying rather than telling information. In addition, despite the variation in question type, more questions mobilized responses that were designed as one-word or multi-word phrasal responses than clauses. This finding, according to Hall, limits students' opportunities for language use and "the possible pathways that learners' developing L2 positionally sensitive grammars can take" (p. 113, this issue).

Especially because of their prevalence, I agree with Hall that it is important to understand how teachers use questions in a language classroom, and I appreciate her reminding us that grammars are positionally sensitive. However, in the interest of forging connections, I would like to make several points from the perspective of CDST: First, let us consider research conducted using Lynne Cameron's "interactional differential" (for discussion, see Larsen-Freeman & Cameron, 2008, pp. 204–211), which compares the difference between what is expected in a student's reply to a teacher's question and the actual student utterances the question elicits. Cameron's research showed that despite the form of a teacher's question, students enacting their agency can completely alter the nature of the communication—

resulting in a prolonged exchange rather than an abbreviated one. The point is that it is what a student chooses to do with a turn that is at issue. In her study, Cameron found that a student's reply to a teacher's question redirected the exchange to a related topic that the student was more familiar with and one that he was motivated to converse about. Second, Cameron's study also demonstrated the positive effects of the teacher's accommodating this student's agentive redirection in the conversational flow. Of course, it is not always desirable to go with the flow, but a teacher's micromomentary decisions are very important, and it seems to me that the value in this improvisational accommodation is what teacher interns should become aware of, if they are not already.

Informed by CDST, a second and related point that is embedded in the attention given to learner agency is to think in terms of affordances rather than input. In other words, it is not the input, but the learner's perception of, and action on, the second-order affordances in the ever-changing context that is fundamental to learning (Larsen-Freeman, 2017; van Lier, 2004). What teachers intend by the questions they pose is not always what learners perceive and act upon. Providing enabling conditions for student-created learning opportunities also offers an important lesson to teacher interns (Larsen-Freeman et al., 2021).

Additionally, complexivist Ricca (2012) underscored the importance of understanding mutual influence: "[A] complexity approach (...) requires that teachers must be transformed by their students as a result of the mutual influence of teachers and students" (p. 43). Therefore, we acknowledge that students and teachers cocreate classroom discourse. As such, we need to better understand how students' replies to teachers' questions influence teachers' subsequent moves because "the information-seeking sequences do not occur as isolated sequences but rather in recurring sequences of sequences," as Hall notes (p. 125, this issue). On a theoretical level, mutual influence is illustrative of the power of a complex systems perspective that brings relational systems thinking into a (classroom) ecology.

Notwithstanding what I have just written, it is important, as I have already mentioned, to understand the effect of teachers' questions, especially due to their prevalence. Hall, for example, maintains that the much-maligned initiation-response-follow-up/feedback (IRF) sequence, which teachers are sometimes criticized for following, can be very helpful in guiding student learning. While I am less certain how much

engineering of teacher questions is possible, certainly presenting novice teachers with the sort of data that Hall has collected could be educational in alerting them to the potential effect of their actions and to the need to adjust them accordingly.

TWO BRIEF GENERAL COMMENTS

In my role as discussant, I feel compelled to make two general observations about this collection. First, there is not much discussion of what linguistic resources the research participants bring to their learning opportunities. In a complex system, it is important to know the initial conditions of the system, which would certainly include the linguistic repertoires of the research participants. Of course, the conditions are always being updated, but plurilingual speakers would surely approach the learning challenge from a different vantage point than monolinguals (Larsen-Freeman & Todeva, 2021).

Second, with regard to problems concerning language use in the real world, such as dialect discrimination and the harmful consequences of monolingual ideologies, there is an absence from articles in this volume of a critical perspective, much needed these days, but one that I believe can find support from scholarship such as manifest in this collection.

CONCLUSION

The contribution of this special issue lies in showing the conceptual power of grammar not as an autonomous inventory of structural items and combinatorial rules, but rather as an embodied resource for social interaction (Pekarek Doehler, 2018) that emerges from, and is shaped by, use over time.

To an outside observer, this move might seem punctilious—a disagreement among academics. However, the choice of words and metaphors is important for how we conceptualize, understand, and research a phenomenon. To this point, I have used the opportunity that has been afforded me as a discussant to identify themes in these articles that resonate with those in CDST: system, synchronization, context, co-adaptation, ecology, iteration, emergence, individual and social dimensions of development and assessment, transformation, reciprocal causality, levels of abstraction, relationship, affordance—all inherited in social interaction.

I imagine those who have a different theoretical commitment might identify other common themes. But the point of my exercise was not to detract from research activities within a particular

tradition but rather to encourage researchers to look beyond their disciplinary focus and to make connections with others to benefit their scholarship and for our mutual enlightenment.

To be sure, dwelling on commonality can block alternative ways of learning, communicating, and knowing. And “Clark (2001, pp. 118–119) points out that by exclusively focusing on unity and similarity, that which is ‘special and distinctive’ is lost sight of” (De Jesus, 2016, p. 134). I certainly did not intend to downplay the unique contribution of CA. Instead, I was advocating for the new kind of thinking that French philosopher and complexity theorist Morin (2008) called for:

We need a kind of thinking that reconnects that which is disjointed and compartmentalized, that respects diversity as it recognizes unity, and that tries to discern interdependencies. We need a radical thinking (which gets to the root of problems), a multi-dimensional thinking, and an organizational or systemic thinking. (p. vii)

NOTES

¹ I will not say more about their implications for all these areas, as they are not all represented in this issue. However, I should note that other scholars have adopted combinations of CA and complex systems. I am thinking of scholars such as Paul Seedhouse (2004), who has shown how a combination of CA and viewing language as a complex adaptive system can be fruitful in researching classroom discourse and professional discourse more generally. Also, I note that the topic of language teaching receives its own discussion in this special issue (see Piirainen-Marsh & Lilja, this issue).

² In a more recent CA study, Matsumoto (2019) has also demonstrated how materials act as an interactional resource that is used for embodied meaning making.

³ For instance, Hellermann and Thorne refer to routinization and entrenchment. A useful complex systems reference in this regard is Hans-Jörg Schmid’s (2020) book, which outlines a model of language that can be characterized as functionalist, usage-based, dynamic, and complex-adaptive.

⁴ I prefer emergence over usage-based (Ellis & Larsen-Freeman, 2006) as the former is more often associated with the emergence at many different timescales—not only ontogenetically, but phylogenetically, and so forth.

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