Conclusion

The take-away message from this book is quite simple: studying connectives and discourse relations matters because they represent cornerstone elements of discourse coherence. Throughout the book, our aim has been to illustrate the wide variety of research produced over the past decades on these two central notions. We have seen that although both concepts are intrinsically related, they cannot be entirely merged. Discourse relations can be conveyed in the absence of connectives through simple juxtaposition, and connectives can in many cases be used to convey more than one discourse relation depending on context.

A major goal of the book was to assume a broad view on both concepts and their interrelations. We illustrated not only connectives' meanings and functions, but also their links to syntax and their emergence in diachrony. We encompassed the comparison of connectives and discourse relations across different languages, genres, and populations of language users. We reserved a large space for the discussion of psycholinguistic studies, illustrating the importance of both concepts for discourse processing, memorization and comprehension throughout the lifespan, for speakers with various degrees of linguistic competences in the spoken and the written modes.

We have addressed a number of important issues linked to the notion of discourse relations. One of them was to explain why a list of unanimously accepted discourse relations cannot be found in the literature. We argued that this lack of consensus reflects the fact that the definition of discourse relations depends to a great extent on the goals of an annotation project, and the level of granularity that it requires. However, we also saw that similar relations exist across frameworks, and that a broad consensus seems to exist about what constitutes a discourse relation. From a psycholinguistic perspective, we saw that different discourse relations do not play the same role for discourse processing. While causal relations seem to be an essential building block for discourse coherence, facilitating both discourse processing and comprehension, other relations are either more

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complex to process (e.g., concessive relations) or do not always facilitate comprehension (e.g., additive relations). Importantly, these processing constraints seem to hold cross-linguistically, at least between the Indo-European languages in which most experiments have been performed. For example, a processing difference between causally or temporally continuous and discontinuous relations (Murray, 1997; Sanders, 2005) has been found in several languages, both in experimental research and in cross-linguistic research performed on parallel directional corpora. Another important finding with respect to the notion of discourse relations – that partly explains differences in processing – is that they are not equal in terms of their degree of cognitive complexity. As a result, children do not acquire them at the same pace. Finally, a crucial observation emerging from the study of discourse relations is their variability across genres, as for example the prevalence of temporal relations is higher in narrative than in argumentative discourse.

We also tackled a variety of questions arising from the study of discourse connectives. We discussed the thorny issue of their categorization depending both on the type of meaning they convey and their actual use in discourse. Regarding their semantic description, we have shown how the semasiological and onomasiological approaches are complementary in uncovering connectives' polyfunctionality. We have also illustrated the multidimensional links that they have with syntax, a lesser-studied topic that nonetheless plays a crucial role in their disambiguation, especially in computational applications. By integrating a diachronic perspective, we were able to sketch different scenarios for the evolution of several categories of connectives, such as coordinating and subordinating conjunctions. We have stressed that most of these diachronic paths are cross-linguistically valid. We also underlined connectives' crucial role for discourse processing and comprehension. In this respect, one of the most notable results is that connectives facilitate discourse processing, and in many cases, also improve comprehension compared to implicit relations, for both children and learners. In the field of first language acquisition, we illustrated the fact that connectives are not easy to master for children. Indeed, while young children already produce many frequent connectives by the time they reach their third birthday, they do not fully understand the same connectives when they are used in texts until the end of their primary school years. We discussed several factors that could explain these difficulties, including the cognitive complexity of the discourse relations that they convey, the order of the segments, but also their polyfunctionality and their frequency in language use.

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We saw that the connectives that remain difficult to master during the teenage years are precisely those with a lower frequency that are often bound to the written mode and polyfunctional. Similar problems are in part responsible for learners' difficulties with connectives, although some of learners' limitations are also specific. For example, many studies have illustrated the role of transfers from the first language, a problem not encountered by monolingual children acquiring their first language. Taken together, these results illustrate the many reasons why connectives are a particularly important but also challenging category of lexical items to master, explaining why important variations of competence remain even between adult native speakers.

It is more than likely that research on discourse relations and connectives will continue to expand during the next decades, bringing answers to currently open questions. We briefly highlight some of the most pressing issues and promising avenues of enquiry. First, most of the empirical research so far included a limited set of mostly Indo-European languages, as well as some widely spoken languages such as Arabic and Mandarin Chinese. Yet, the use of connectives is likely to be much more variable than what has been observed so far based on this rather limited dataset. It will be crucial for future research to target languages from other families and continents in order to broaden the scope of our knowledge, for example, by exploring the use of connectives in languages that are not written. In this respect, Marchal, Scholman and Demberg (2021) showed that pidgin languages too can develop at least some specific uses of connectives. There is also emerging research in the area of signed languages, where the focus has mainly been on a restricted set of signs fulfilling discourse connective (and discourse marker) functions (Gabarró-López, 2019; Crible & Gabarró-López, 2021). More research of a similar nature will represent an important step ahead to understand the way discourse is structured across languages, be they written, spoken or signed.

The inclusion of languages without writing systems in empirical research is all the more important as the use of connectives in speech was found to be quite different from their written usages, even in Indo-European languages (e.g., Crible & Cuenca, 2017). In speech, the line between discourse connectives and discourse markers is also less clear-cut than in writing, leading to interesting renegotiations of the meanings and functions for both categories. Here again, the inclusion of more spoken languages will be crucial to add validity to current definitions. In addition to including more languages, future research will also need to compare genres more systematically, both in the written and the spoken modes. Spoken genres and written genres related to

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new media are still far too underrepresented in current analyses compared to more traditional written genres such as journal articles and argumentative texts (but see Sanders and Spooren (2015) for a study including chat interactions or Uygur-Distexhe and Degand (2015) for a comparative study between face-to-face, chat and SMS interaction). This limitation is all the more important in cross-linguistic studies, which are still mostly limited to one or two genres. In this respect, the development of new corpora and tools to analyze them will enable researchers in future years to broaden these comparisons to more numerous and diverse genres. A few studies have already shown that crucial differences emerge from such cross-linguistic, cross-genre comparisons, both for connectives (e.g., Dupont & Zufferey, 2017) and discourse relations (Lapshinova-Koltunski, Nedoluzkho & Kunz, 2015), but similar comparisons should be generalized to cross-linguistic corpus research.

Another currently underexplored area of research concerns the role of alternative signals such as syntactic patterns, semantic relations between content words and punctuation marks for the communication of discourse relations. Even though corpus research has demonstrated that a large majority of discourse relations are signaled by such means rather than by connectives (e.g., Das & Taboada, 2013), they have so far not been the topic of much empirical research (but see Crible & Pickering, 2020; Schwab & Liu, 2020). Such studies will be crucial to enhance our understanding of the factors that guide discourse processing and comprehension, and constitute a promising avenue of enquiry for future research.

Alongside these new theoretical developments, the use of experimental methods has spread at a very rapid pace in linguistics over the past decades (Zufferey & Gygax, 2023), and these new methods have been applied to the study of discourse relations and connectives. As we saw in Chapters 6, 8 and 9, such studies have already proved invaluable to increase our understanding of connectives' functions in discourse, as well as the way discourse relations are acquired, understood and processed during reading. In the coming years, experiments should be devised to assess a broader range of connectives, as well as discourse relations in many different languages, as these studies still, for the time being, almost exclusively focus on prototypical and frequent connectives, in a handful of languages. In addition, while it is clear that all connectives are not equally difficult to process and understand, the factors that could influence this complexity are still not fully known. So far, most studies focus on the notions of cognitive complexity and frequency in language use, yet other factors such as

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the mode in which a connective is typically used, its register, as well as the semantic transparency of the connective's meaning should also be investigated more systematically. In terms of populations, more studies are needed in particular to assess growing competence during the teenage years, in order to bridge the gap between early acquisition studies and studies focusing on adult populations.

In the case of adults, a crucial development for future research will be the inclusion of more systematic measures of individual variations, as these seem to be quite large, at least for connectives from the written mode. Yet, compared to other domains of language, research on individual variations in the domain of discourse remains scarce (Kidd, Donnelly & Christiansen, 2018). Future research should therefore strive to include more sociolinguistic diversity in the tested populations, and to resort to crowdsourcing techniques to test the validity of theoretical categories such as discourse relations that are defined by linguists (see, e.g., Scholman & Demberg, 2017; Scholman et al., 2022). Another domain in which experimental research still needs to be expanded is the study of second language learners, as so far, corpus studies still largely dominate the field. Yet, experimental data provides a unique viewpoint on the causes of learners' many difficulties with connectives. Future studies should also investigate the impact of teaching techniques for the acquisition of connectives, both in L1 and L2, as current experimental research often lacks concrete pedagogical applications.

In sum, the study of connectives and discourse relations has been very prolific for the past decades, leading to important new findings regarding the way discourse is structured, processed and understood. This research already provided a unique viewpoint on the manifold links between the lexicon, grammar and discourse, across languages and minds. Yet, the many open questions still remaining will keep linguists and psychologists busy for decades to come.

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