Table 8.5 Decomposition of Specificity

ID	Type	Freq.
3	Derivational Changes	1 %
5	Same Pol. Sub. (habitual)	17 %
6	Same Pol. Sub. (contextual)	9 %
7	Same Pol. Sub. (named entity)	2 %
9	Opp. Pol. Sub (habitual)	2 %
11	Synthetic / Analytic sub.	9 %
14	Negation Switching	1 %
16	Anaphora	1%
23	Addition / Deletion	50 %
27	Cause and Effect	7 %
28	Condition / Property	1 %
33	Transitivity	1 %
34	Other (General Inferences)	1 %

8.6 Discussion

In Section 8.3, we posed two Research Questions that we wanted to address within this paper. We answered both of them in sections 8.4 and 8.5. Our annotation demonstrated that a shared typology can be successfully applied to multiple relations. The quality of the annotation is attested by the high inter-annotator agreement. We also demonstrated that a shared typology, such as SHARel, is useful to compare different meaning relations in a quantitative and human interpretable way.

In this paper we provide a new perspective on the joint research into multiple meaning relations. Traditionally, the meaning relations have been studied in isolation. Only recently researchers have started to explore the possibility of a joint research and a transfer of knowledge. We propose a new framework for a joint research on meaning relations via a shared typology. This framework has clear advantages: it is intuitive to use and interpret; it is easy to adapt in practical setting - both in corpora creation and in empirical tasks; it is based on solid linguistic theory. We believe that our approach can lead to a better understanding of the workings of the meaning relations, but also to improvements in the performance of automated systems.

The biggest challenge in the joint study of meaning relations is the limited availability of corpora annotated with multiple relations. The corpus that we used for our study is relatively small in size. It also has restrictions in terms of sentence

length and the frequency of Named Entities. However, it is the only corpus to date annotated with all relations of interest.

Despite the limitations of the chosen corpus, the obtained results are promising. We provide interesting insights into the workings of the different relations, and also outline various practical implications. Kovatchev et al. [2019b] demonstrated that a corpus with a size of a few thousand sentence pairs can be successfully used as a qualitative evaluation benchmark. SHARel and the annotation methodology we used easily scale to such size of corpora. This opens up the possibility for a qualitative evaluation of multiple meaning relations as well as for easier transfer of knowledge based on the particular types involved in the relations.

8.7   Conclusions and Future Work

In this paper we presented the first attempt towards decomposing multiple meaning relations using a shared typology. For this purpose we used SHARel - a typology that is not restricted to a single meaning relation. We applied the SHaRel typology in an annotation study and demonstrated its applicability. We analyzed the shared tendencies and the key differences between paraphrasing, textual entailment, contradiction, and specificity at the level of linguistic and reason-based types.

Our work is the first successful step towards building a framework for studying and processing multiple meaning relations. We demonstrate that the linguistic and reasoning phenomena underlying the meaning relations are very similar and can be captured by a shared typology. A single framework for meaning relations can facilitate the analysis and comparison of the different relations and improve the transfer of knowledge between them.

As future work, we aim to use the findings and resources of this study in practical applications such as the development and evaluation of systems for automatic detection of paraphrases, entailment, contradiction, and specificity. We plan to use the SHARel typology for a general-purpose qualitative evaluation framework for meaning relations.