

Antonymic co-occurrence: overview of the syntactic patterns model

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1. Introduction

The lexical relation of antonymy is generally conceived as a paradigmatic relation between two lexemes with opposite meanings. Antonyms are mainly studied in pairs and out of their context of use; e.g. *good/bad*, *do/undo* or *brightness/darkness*. In this perspective, the main goal of existing research is to use notions such as polarity, semantic scales or gradation to describe the type of opposition characterizing the observed pairs.

This approach masks both the semantic influence of the context on antonymic pairings (*brightness* is also an antonym of *stupidity* in some contexts) and the syntactic and semantic roles of antonyms that are used together in the same sentence or in the same group of sentences. These roles are highlighted by lexicometric studies (Justeson and Katz 1991) demonstrating that antonyms appear together in the same sentence more often than predicted by chance. This observation is the starting point of discourse studies recently dedicated to antonymy.

2. Studies on antonymic co-occurrence

Studies on antonymy in discourse can be classified into three categories.

- (1) The first category consists of rhetorical and pragmatic analyses of antonyms uses in stylistic figures like paradoxes (Landheer and Smith 1996). Antonyms are studied as one kind of instrument that serves a rhetorical purpose.
- (2) Studies of the second type describe the process of creating "new antonyms" in context next to antonymic pairs already encoded in the language system

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(Jeffries 2010). The term *antonymy* thence comprises any opposition relationship in discourse: it is not limited to relationships between lexemes considered as antonyms outside the particular utterance studied.

- (3) The third type of study focuses on contextual uses, be they rhetorical or not, of conventionalized antonymic pairs. These studies, based on the empirical analysis of textual data, consider two key aspects of discursive antonymy: 1) syntactic patterns that underlie the co-occurrence of antonyms in discourse and 2) discourse functions that co-occurrent antonyms can fulfil.

This paper focuses on the third category.

3. The syntactic patterns model

The generally preferred model for analyzing contexts with co-occurrent antonyms is the syntactic patterns model. Syntactic patterns, such as *X connector Y*, where *X* and *Y* are antonyms, are identified by Arthur Mettinger (1994) through the study of antonymic co-occurrence in a literary corpus. Mettinger identifies patterns such as *X and Y*; *X, at the same time Y*; *neither X nor Y*; *X or Y*; etc., as well as a pattern where *X* and *Y* are simply juxtaposed without any connector.

Jones (2002), then the CLRG (2012), make use of Mettinger's patterns and enrich them by searching within a broader corpus for 56 selected antonymic pairs. They identify 26 syntactic patterns (*turning X into Y*; *X gives way to Y*; *from X to Y*; *X but Y*; *either too X or too Y*; *deeply X and deeply Y*; etc.).

The approach is adapted to French in Natural Language Processing (NLP) studies (Morlane-Hondère 2008, Fabre 2010). Ten syntactic patterns (*à la fois X et Y*; *X ou Y*; *ni X ni Y*; *soit X soit Y*; etc.) are used for the automatic extraction of antonymic relationships from a corpus. The restricted use of these patterns for NLP purposes explains their low numbers: patterns that are too general (*X and Y*) or too specific (*a gap between X and Y*) are less efficient for searching within corpora (they output too much irrelevant data).

This paper on co-occurrences of conventionalized antonyms in written French aims to describe the semantic and syntactic relationships between co-occurrent antonyms; and between them and their linguistic environment. Unlike Morlane-Hondère and Fabre, it does not focus on confirming antonymic pairings listed in dictionaries or identifying new ones in syntactic patterns. Neither does it proceed as Mettinger, Jones or the CLRG do, by identifying the surface formal structure of antonymic co-occurrence.

4. Limits of the syntactic patterns model

Co-occurrent antonyms can be linked without any overt connector, and thus cannot be described in terms of syntactic patterns.

To demonstrate this, co-occurrent antonyms were extracted from a corpus consisting of articles from *Le Monde* newspaper. With a search engine, the corpus was searched for each of the antonymic pairs of the list we established according to the *Grand Robert* (2001). This list contains more than a thousand pairs. The results show that more complex and less linear co-occurrences, sometimes without a connector, can be identified. Co-occurrences can thus be classified into six categories: (1) with connector; (2) without connector; (3) endo-sentential; (4) trans-sentential; (5) homocategorical; (6) heterocategorical (see Table 1).

(1)(2) The absence of a connector between two co-occurrent antonyms does not mean the absence of a relationship between them. They can be linked by predicative structures: predicative antonyms sharing their arguments (h), antonyms sharing their governors (e), semantic connections between the arguments or governors of each member of an antonymic pair (f, g).

	Endo-sentential	Trans-sentential
With connector	<u>Homocategorical</u> (a) « [...] présence captivante et voix capiteuse, aigus et graves faciles, diction plus que satisfaisante. » (<i>Le Monde</i> 15/05/2011)	<u>Homocategorical</u> c) « Car l'enjeu véritable n'est pas le plafond de la dette, mais la baisse drastique des dépenses publiques [...] Or, les études abondent : en prônant un mixte de coupes budgétaires et de hausse s ciblées d'impôts, le plan Obama est bien plus à même de résorber la dette [...] » (<i>Le Monde</i> 25/05/2011)
	<u>Heterocategorical</u> (b) « La critique boude le film mais la [Valentine Tessier] couvre d' éloges . » (<i>Le Monde</i> 10/03/1991)	<u>Heterocategorical</u> d) « Le PRI s'attendait à une large victoire comme pour les législatives de 2009. Mais il va perdre deux, voire trois États très peuplés [...] » (<i>Le Monde</i> 07/07/2010)

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Without connector	<u>Homocategorical</u> e) « Pour Marion Bartoli, un mouvement ne naît jamais de l' immobilité . » (<i>Le Monde</i> 03/06/2011).	<u>Homocategorical</u> g) « Le projet [...] doit permettre de réduire l'insécurité énergétique du pays. Les six unités du site déployées de 2012 à 2015, la centrale devrait afficher une puissance de 4 800 mégawatts (MW) et augmenter le potentiel électrique du pays de près de 12 %.. » (<i>Le Monde</i> 08/04/2010)
	<u>Heterocategorical</u> f) « La discussion exprime, à mots calmes , l' anxiété d'une saison ravageuse. » (<i>Le Monde</i> 05/06/2011)	<u>Heterocategorical</u> h) « [...] il existe un lien inversement proportionnel entre l' augmentation des déficits et de la dette et la croissance. [...] le patron de l'AMF ajouta que toute la question est, dorénavant, de savoir comment répartir les efforts, comment réduire les déficits dans le respect de l'équité et de la justice. » (<i>Le Monde</i> 19/05/2010)

Table 1 – Six categories of antonymic co-occurrence

(3)(4) Studies of antonymic co-occurrence do not pay attention to antonymic pairs spread across two typographical sentences – henceforth ‘trans-sentential co-occurrence’; vs. endo-sentential co-occurrence, where both antonyms are in the same sentence. Syntactic patterns have been identified for endo-sentential co-occurrences. Trans-sentential co-occurrences may also correspond to these patterns, as in d): *The party expects victory. But loses.* However, the structures of these patterns are not comparable across endo-sentential and trans-sentential co-occurrences, due to the variable number of clauses or adjuncts. If a typical surface syntactic pattern between antonyms *X* and *Y* has to be formalized, it must be *X An connector Bn Y*, where *An* and *Bn* are strings containing an indefinite number of words.

(5)(6) Heterocategorical co-occurrence is co-occurrence of antonyms that do not belong to the same part of speech. Heterocategorical pairs can be considered as non-prototypical antonyms. Syntactic patterns cannot bring together all homo- or heterocategorical antonymic pairs. *X devient Y* or *X se transforme en Y*, for example, are not compatible with pairs of verbs (**Monter devient descendre* but *La montée devient descente*) nor with heterocategorical pairs which include a verb (**L'augmentation devient baisser* but *L'augmentation devient baisse*).

Only the top four cells of the table are fully compatible with the model of syntactic patterns as described in particular by Jones (2002).

5. Towards an alternative model

To provide a finer tool for antonymic co-occurrence analysis, we propose a method based on the semantic-syntactic functions (Mejri 2011, Gross 2012). According to this theory, a lexeme in a sentence like *Yesterday, John gave flowers to Mary*, can be (i) a predicate, i.e. a unit which selects other units to construct with them a basic assertion scheme (*give*), (ii) an argument, i.e. a unit selected by a predicate (*John, flowers* and *Mary*) or (iii) an actualizer, i.e. a unit used to insert a predicate in a spatial-temporal situation (*yesterday*).

Applied to antonymic co-occurrences, this analysis grid provides a fine-grained approach that is useful to distinguish these three sentences where antonyms are involved in the same syntactic pattern, *X et Y*.

- 1) [à propos des aliments] « Il faut simplement en **supprimer** certains et en **ajouter** d'autres, indiquent les chercheurs. » (*Le Monde* 07/05/2011).
- 2) « Bloch **abandonne** l'aventure pour quelque temps, et Potez **poursuit** seul l'entreprise. » (*Le Monde* 31/05/2011).
- 3) « Mais Bocharova fait oublier Borodina en quelques secondes : présence captivante et voix capiteuse, **aigus** et **graves** faciles, diction plus que satisfaisante. » (*Le Monde* 15/05/2011).

In the first two sentences, antonyms are predicative verbs with different arguments. In example 1), these arguments (*certaines; d'autres*) are pronouns that designate different types of foods. In example 2), the subject-arguments of the antonyms are two different proper nouns (*Bloch; Potez*). The second argument is the same for the two antonyms – *aventure* and *entreprise* being here synonyms designating the same referent. In example 3), both antonyms are arguments of the same predicative adjective *facile*. In these sentences, the semantic-referential functions of co-occurrent antonyms are different: antonyms are used to distinguish two sub-species of foods depending on whether or not we should eat them (ex. 1), to oppose two people in terms of their behavior (ex. 2) or to indicate that a singer easily performs all sounds regardless of their pitch (ex. 3). These semantic-referential functions rely on the semantic-syntactic roles of the antonyms (predicate, argument and actualizer), not on the syntactic pattern in which they appear.

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6. Conclusions

The analysis of the antonymic co-occurrences extracted from our French journalistic corpus shows two important facts that cannot be neglected in further studies on antonymy in discourse:

- 1) Antonymic co-occurrences are not limited to syntactic patterns.
- 2) Semantic-syntactic functions are essential to describe antonymic co-occurrences and their discursive roles.

Notes

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