



**HAL**  
open science

## A Taxonomy of Real-Life Questions and Answers in Dialogue

Maxime Amblard, Maria Boritchev, Marta Carletti, Lea Dieudonat, Yiting Tsai

► **To cite this version:**

Maxime Amblard, Maria Boritchev, Marta Carletti, Lea Dieudonat, Yiting Tsai. A Taxonomy of Real-Life Questions and Answers in Dialogue. SemDial 2019 - LondonLogue - 23rd Workshop on the semantics and pragmatics of dialogue, Sep 2019, London, United Kingdom. hal-02269609

**HAL Id: hal-02269609**

**<https://inria.hal.science/hal-02269609>**

Submitted on 23 Aug 2019

**HAL** is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

# A Taxonomy of Real-Life Questions and Answers in Dialogue

Maxime Amblard, Maria Boritchev, Marta Carletti, Lea Dieudonat, Yiting Tsai

LORIA, UMR 7503, Université de Lorraine, CNRS, Inria

Nancy, France

{maxime.amblard, maria.boritchev}@loria.fr

{martacarletti1993, leadieudonat}@gmail.com

yi-ting.tsai5@etu.univ-lorraine.fr

## Abstract

We present a taxonomy of questions and answers based on real-life data extracted from spontaneous dialogue corpora. This classification allowed us to build a fine-grained annotation schema, which we applied to several languages: English, French, Italian and Chinese.

## 1 Introduction

Nowadays, most spoken dialogue systems focus on task-based communication (making reservations, getting information, *etc.*). Annotations are often limited to domain-specific purposes. Many dialogues, especially task-oriented ones, are annotated with speech acts, which are a powerful tool to detect questions' and answers' intentions. A tradition of question and answers modelling inspired by logic approaches has been introduced by (Asher and Lascarides, 2003). From a more linguistic point of view, (Ginzburg and Sag, 2000) presents a detailed study of questions coupled with insights on their answers.

As most annotations are highly specific to a task, they fail to account for the complexity of spontaneous dialogues. Our schema is designed to handle phenomena encountered in real-life conversations. We worked on corpora of transcriptions of spontaneous dialogues, mainly in English (Norrick, 2017). We produced an annotation schema that we tested on French (ATILF, 2018), Italian (Sciubba et al., 2014) and Chinese (University, 2015). In this short paper, we focus on questions and answers classification (sect. 2) and on their combinations (sect. 3).

## 2 Questions and answers classification

We classify the questions and the answers according to their *form* and their *function*, following (Freed, 1994; Blandón et al., 2019). We do not pretend to be exhaustive here as answers can take

arbitrary forms following the non-verbal context of the dialogue. This taxonomy presents the main types of answers one can encounter in real-life corpora of transcribed oral conversations. The form of an utterance is defined by its syntactic form – such as syntactic inversions – and the lexical items that it contains (*wh*-words, 'yes', 'no', *etc.*). The function of an utterance is close to the concept of Austin's illocutionary force (Austin, 1975): it is defined by the intention of the speaker. Our taxonomy takes root in a previous classification schema where questions and answers were classified according to a mixture of form and function (Blandón et al., 2019). In this annotation schema we want to keep the form and the function of questions and answers separate.

In Table 1, we sum up the possible forms and functions for questions and answers. We assume that the interpretation of answers' forms (upper-right) and questions' functions (lower-left) do not need to be developed here. If we look at question forms, *disjunctive* questions can be *inclusive* or *exclusive* (resp.), depending on the interpretation of 'or': 'Do you want sugar or **milk** in your coffee?' vs 'Do you want sugar or **stevia** in your coffee?'. Here, the interpretation of 'or' depends on its arguments. Questions can be *auxiliary-deontic* ('Can you hand me the salt?') or *auxiliary-epistemic* ('Can you swim?') depending on the auxiliary they contain.

Finally, answers functions can vary a lot. Some are lexical, such as *give* feature, proposed in Boritchev (2017) (adapted from Jurafsky and Martin 2000), which corresponds to an answer to a *wh*-question ('Where do you live?'/ 'In Paris.'). Others correspond to an action, such as *perform* ('Can you hand me the salt?'/ '...'/ 'Thank you.').

	Questions	Answers
Form	Yes/No, Wh, Disjunctive-Inclusive, Disjunctive-Exclusive, Auxiliary-Deontic, Auxiliary-Epistemic	Yes/No, Wh, Uncertain, Unknown
Function	Completion Suggestion, Phatic, Ask_Confirmation, Ask_Feature, Ask_Performance, Reported Speech (RS)	Refuse, Accept, Phatic, Give_Confirmation, Give_Uncertainty, Give_Unknown, Reported Speech (RS), Give_Feature, Perform, NONE

Table 1: Forms and Functions of Questions and Answers

### 3 Combining questions and answers

Questions and answers interact with each other. After an analysis of them in isolation, we consider how their association works and how it can result in comprehension. To do so, we introduce the notions of *symmetry* and *mismatch*. An answer is symmetric (see ex. 1) to its question when the semantic or syntactic requirements imposed by the question are fulfilled by the answer. If it is not the case, it is asymmetric (see ex. 2).

#### Example 1 Symmetry of form and function

A: *Why are you crying?*

B: *Because I hurt myself.*

In this example, the question is of Wh-form and its function is Ask\_Feature. As the answer starts by ‘Because’, it is classified as of Wh-form and its function Give\_Feature. Therefore, the semantic requirement imposed by the question is fulfilled by the answer.

#### Example 2 Asymmetry of form and function

A: *so- wh- where can you move to?*

B: *Well...you know...I don't even know where I'm living next year.*

In ex. 2, the question is of Wh-form and its function is Ask\_Feature. Yet, the answer is fuzzy and is classified as of Uncertain form and Give\_Uncertainty function. Therefore, the syntactic requirement is not fulfilled.

Next, we define the notions of *mismatch of form (resp. function)*: when there is an asymmetry of form (resp. function) between a question and its answer, a mismatch of form (resp. function) occurs if and only if the form (resp. function) of the given answer doesn't fall under one of the forms (resp. functions) accepted by the question. The identification of compatible questions and answers goes through tables of compatibility. They map the forms and functions that can combine with each other (in both cases of symmetry and asymmetry). In Table 2, question forms are associ-

ated with a set of answer forms that do not trigger a mismatch. Table 3 presents compatibilities of functions.

Q_Forms	Expected answer forms
Yes-no	{Yes/No, Uncertain, Unknown}
Wh	{Wh, Uncertain, Unknown}
Disj._Inclusive	{Yes/No, Uncertain, Unknown}
Disj._Exclusive	{Wh, Uncertain, Unknown}
Aux._Deontic	{Yes/No, NONE, Performance}
Aux._Epistemic	{Yes/No, Uncertain, Unknown}

Table 2: Compatibility form

Q_Function	Expected answer function
Completion Suggestion	{Refuse, Accept, Phatic, Give_Confirmation}
Phatic	{Refuse, Phatic, Give_Confirmation, Report, NONE}
Ask_Confirmation	{Refuse, Accept, Give_Uncertainty, Give_Unknown, Give_Confirmation}
Ask_Feature	{Give_Feature, Give_Uncertainty, Give_Unknown}
Ask_Performance	{Perform, NONE, Give_Unknown, Give_Uncertainty, Accept}
RS	{Phatic, Reported, NONE}

Table 3: Compatibility function

## 4 Conclusion

This taxonomy of questions and answers allowed us to produce an annotation schema. We tested it on English, French, Italian and Chinese corpora.<sup>1</sup> We were able to tag a wide range of questions and their possible answers. The notion of mismatch allowed us to detect cases of indirect answers and distinguish them from cases where no answers were given. Following this process, we

<sup>1</sup>See our poster for results.

are also able to combine sequences of questions and answers in coherent blocs that constitute negotiation phases (Boritchev and Amblard, 2018).

## References

- Nicholas Asher and Alex Lascarides. 2003. *Logics of conversation*. Cambridge University Press.
- ATILF. 2018. *Tcof : Traitement de corpus oraux en français*. ORTOLANG (Open Resources and TOols for LANGUAGE) –www.ortolang.fr.
- John Langshaw Austin. 1975. *How to do things with words*. Oxford university press.
- María Andrea Cruz Blandón, Gosse Minnema, Aria Nourbakhsh, Maria Boritchev, and Maxime Amblard. 2019. Toward dialogue modeling: A semantic annotation scheme for questions and answers. In *The 13th Linguistic Annotation Workshop (The LAW XIII)*.
- Maria Boritchev. 2017. Approaching dialogue modeling in a dynamic framework. Master's thesis, Université de Lorraine.
- Maria Boritchev and Maxime Amblard. 2018. *Coffee or tea? Yes*. SEMDIAL 2018 (AixDial) - The 22nd workshop on the Semantics and Pragmatics of Dialogue. Poster.
- Alice F. Freed. 1994. The form and function of questions in informal dyadic conversation. *Journal of Pragmatics*, 21(6):621 – 644.
- Jonathan Ginzburg and Ivan A. Sag. 2000. *Interrogative Investigations: the form, meaning, and use of English interrogatives*. CSLI Publications, Stanford.
- Daniel Jurafsky and James H. Martin. 2000. *Speech and Language Processing: An Introduction to Natural Language Processing, Computational Linguistics, and Speech Recognition*, 1st edition. Prentice Hall PTR, Upper Saddle River, NJ, USA.
- Neal Norrick. 2017. *SCoSE part 1: Complete conversations*. English Linguistics, Department of English at Saarland University.
- Maria Eleonora Sciubba, Stefania Marzo, and Elwys De Stefani. 2014. Strengthening students interactional competence in Italian L2 by exploiting a corpus of video-recorded spontaneous interactions. ALIAS–Archivio di LinguA Spontanea. In *Euro-Call 2014, Date: 2014/08/20-2014/08/23, Location: Groningen*.
- HongKong Polytechnic University. 2015. PolyU corpus of spoken Chinese. Department of English.