

Annotation of Greeting and Leave-taking in Social Text Dialogues Using ISO 24617-2

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Abstract

Dialogue act annotation aids understanding of interaction structure, and also in the design of artificial dialogue. While many dialogues can be described as task-based or instrumental, others are more interactional. These categories are not mutually exclusive; many service encounters include social talk. Much research on dialogue and particularly on description of dialogue acts for use in dialogue systems has focused on task-based dialogue. However, attention has been focusing on social aspects of spoken and text interaction, particularly in light of newer systems designed for domains such as companionship. In this paper we briefly describe social or casual talk, review how current dialogue annotation schemes, and particularly the ISO standard 24617-2 “Semantic annotation framework, Part 2: Dialogue acts”, treat non-task elements of dialogue. We describe the collection and annotation using the ISO standard of a corpus of 193 text dialogues, report on an analysis of dialogue acts used in greeting, introductions and leave-taking, and propose new dialogue acts to provide coverage of these fundamental conversational sequences.

1 Introduction

It is widely accepted that dialogues proceed through dialogue moves or acts, and dialogue act annotation is very valuable in furthering understanding of the structure of interactions, particularly when such knowledge is needed in the design of artificial spoken or text dialogue. While many dialogues and indeed parts of dialogues can be described as task-based or instrumental, with clear goals, as in the case of a service encounter or business meeting, others are more interactional in nature, as in friendly chats or longer casual conversations. Indeed many service encounters include social talk from formulaic greetings and

leave-taking to smalltalk. Much research on dialogue and particularly on description of dialogue acts for use in dialogue systems has focused on transactional or task-based dialogue, and often on the task itself. However, attention has been focusing on social aspects of spoken interaction, particularly in light of newer systems designed for domains such as companionship. In this paper we briefly describe social or casual talk as a model for spoken and written social interaction, reviewing how current dialogue annotation schemes and particularly the ISO standard 24617-2 Semantic annotation framework, Part 2: Dialogue acts (ISO, 2012) (henceforth ISO standard) treat non-task elements of dialogue. We then describe the collection and annotation using the ISO standard of a corpus of 193 text dialogues and report on a study of the dialogue acts used in greeting and leave-taking. From this we propose new dialogue acts to provide fuller coverage of these sequences which are fundamental to conversation.

2 Instrumental and Interactional Dialogue

With the advent of new communication technologies, text has become a medium for practically synchronous interaction. For much of history, written messages were asynchronous and did not approach the fine-grained interaction and collaboration of spoken interaction. Dialogue systems model spoken or written synchronous or near-synchronous interactions, often to fulfill a task but increasingly to create the illusion of a more social or friendly interaction, whether for casual or interactional conversation or to ‘lubricate’ more transactional exchanges. The text of such exchanges is closer to speech than is traditional formal written language, as has long been observed in Fairclough’s ideas of ‘conversationalization’ of text (Fairclough, 1992) and Ong’s notions of secondary orality (Ong, 1982). With live text exchange a part of everyday life we have seen an explosion of casual writing - writing which is not performed for a formal purpose but rather to fulfill social goals. It seems likely that such dialogues could be better understood with reference to spoken casual conversation, which has been the subject of study in several disciplines - we review the core notions below.

Casual social conversation includes smalltalk, gossip, and conversational narrative. Aimless social talk or ‘phatic communion’ has been described as an emergent activity of congregating people, and viewed as the most basic use of language (Malinowski, 1936). Researchers have theorized that such talk functions to build social bonds and avoid unfriendly or threatening silence, rather than simply to exchange information or express thought, as postulated in much linguistic theory. Instances of these views are found in the phatic component in Jakobson’s model of communication (Jakobson, 1960), distinctions between interactional and instrumental language (Brown and Yule, 1983), and theories that language evolved to maintain social cohesion Dunbar (1998). Early analytic work on smalltalk focused on the ‘psychologically crucial margins of interaction’, conversational openings and closings in particular. This work suggests that small talk performs a lubricating or transitional function allowing talk to progress from initial silence through stages of greeting, to the business or ‘meat’ of the interaction, and back to closing sequences and to leave taking (Laver, 1975). The structure of casual conversation has been described in terms of distinct phases; often beginning with ritualised opening greetings, followed by approach segments of light uncontroversial small talk, and in longer conversations leading to more informative centre phases (consisting of sequential but overlapping topics), and then back to ritualised leave-takings (Ventola, 1979). Schneider (Schneider, 1988) highlighted features prevalent in casual talk which did not seem to conform to Gricean ideas of dialogue - in particular, idling sequences of repetitions of agreeing tails such as ‘Yes, of course’, ‘MmHm’ which seem to keep the conversation going rather than add any new information. He proposed a set of maxims peculiar to this genre, concentrated on the importance of avoiding silence and maintaining politeness, and suggested that Grice’s Co-operative Principle itself (Grice, 1975) remained relevant to small talk although several of the related maxims did not apply.

Syntactical, lexical, and discourse differences between (casual) conversation and more formal spoken and written genres are described in Biber and Leech’s work on the Longman Corpus of Spoken and Written English (LSWE), particularly in their chapter on the grammar of conversation (Biber et al., 1999). In terms of function, Slade and Eggins view casual conversation as the space in which people form and

refine their social reality (Egins and Slade, 2004) citing gossip between workmates, where participants reaffirm their solidarity, and dinner table talk between friends. They describe the structure of social talks as segments of ‘chat’ (interactive exchanges involving short turns by all participants) and ‘chunks’ (longer uninterrupted contributions). Instrumental and interactional exchanges differ in duration; task-based conversations are bounded by task completion and tend to be short, while casual conversation can go on indefinitely. In the current work, we have started at the edges of conversations, with greetings/introductions, and leave-taking sequences. Below we review the coverage of social dimensions of talk in dialogue act annotation schemes.

3 Dialogue Act Annotation of Interactional Talk

Existing dialogue act annotation schemes are very much task-based, perhaps due to the focus on task-based dialogue for much of the history of modern dialogue systems (Allen et al., 2001). While there have been some schemes based on text conversations (Kim et al., 2010), the vast bulk of schemes have been based on spoken interaction. There have been several annotation schemes developed, often in conjunction with particular corpora or experiments, such as the schemes developed to annotate Trips and Trains, Switchboard, ICSI, and the AMI corpus (Traum, 1999; Core and Allen, 1997; Jurafsky et al., 1997; Shriberg et al., 2004; McCowan et al., 2005). More extensive domain independent schemes such as DIT++ (Bunt, 2006) have been developed culminating in the ISO standard for dialogue act annotation. The ISO standard is very useful as it (i) amalgamates contributions from pre-existing schemes, and (ii) is multifunctional and multidimensional - several acts can apply to stretches within the same contribution.

Most dialogue annotation schemes include a number of social obligation management functions. In a survey of 14 schemes, Petukova found that 10 included greeting functions, 4 included introductions, 6 had goodbyes, 5 included apology type functions, and 5 contained thanking (Petukhova, 2011). Three systems (AMI, MALTUS, and Primula) provided broader tags to reflect ideas of positivity and negativity, politeness, and positive and negative face work. The ISO standard covers more of these functions than previous schemes, although it is still largely task-based, with tags for social functions in the Social Obligations Management (SOM) dimension restricted to formalities such as greetings, apologies, or farewells. The SOM dimension of the ISO standard contains nine communicative functions - initialGreeting, initialSelfIntroduction, returnSelfIntroduction, apology, acceptApology, thanking, acceptThanking, initialGoodbye, and returnGoodbye.

Below we describe the collection and annotation of a hybrid social/task-based corpus of text dialogues which was annotated with an extended version of the ISO to more fully cover various social functions in greeting, introductions, and leave-taking.

4 ADELE Corpus - Collection

A corpus of 193 two-person text dialogues was collected and annotated with the ISO standard to provide initial training data for the ADELE project, a personalized intelligent companion capable of conversational, social dialogue. Below we briefly describe the scenario and participants and outline the interaction platform used.

4.1 Scenario

The dialogues were text-based and dyadic between English speaking adults connecting remotely via a web-based interface. Each participant was given a persona with information on home, relationships, nationality, job, hobbies and interests. The objective was to discover this information about the interlocutor and also to discover any facts or interests in common. Participants were instructed to be friendly and chatty. In order to promote friendly chat rather than ‘interviewing’ behaviour, one point was given for each piece of information discovered while five points were given when commonalities were discovered.

While the underlying aim of the collection was to collect dialogue acts requesting or offering information and expanding on topics, the nature of the conversations meant that the corpus also contained examples of greeting and leave-taking and casual talk for practically all of the conversations gathered.

4.2 Interaction Platform Design

The data were collected using a Dialogue Interface, which is a Google Chrome extension for the team collaboration tool Slack¹, developed in HTML5, CSS3 and JQuery. Interactions were scheduled using a Matching Engine, a RESTful API developed in Java JAX-RS and Jersey that creates new conversations between pairs of available participants and assigns each one a randomly-generated persona. All data were collected in the Dialogue Database (PostgreSQL). Through the dialogue interface, participants could converse with their match in the experiment, fill in the persona traits of the other participant and view their own.

4.3 Data Collection

The conversations were collected over two months in late 2016. There were 37 participants (26M/11F, age range 18-43), all of whom were either native English speakers or at least meeting the requirements of the IELTS International English Language Testing Service examination at level 6.5 and working/studying and living in Ireland. A total of 193 completed dialogues were collected. During the experiment, the participants interacted over the interface to discover attributes of their partner's persona. When all the attributes of a persona were discovered, participants could leave the interface. If they wished, they could be re-assigned a new fictitious persona and another anonymous participant to start a new conversation with. Thus, a participant could take part in more than one conversation over the course of the data collection, but not with a previous partner.

5 ADELE Corpus - Annotation

The conversations were annotated using a modified version of the ISO standard. A pilot annotation of a subset of the corpus was carried out by two annotators using the ISO standard to determine its suitability and whether extensions were necessary.

The dialogue act annotation of the entire conversations was to be used to train a spoken dialogue system which would be able to play the roleplaying game described above with a human partner. Therefore, lexical tags were added to the core dialogue InfoTransfer acts. These tags reflected the topic being discussed by the participants. In order to distinguish between utterances which moved the dialogue forward (by informing the interlocutor of one of the pieces of information needed to accomplish the task) and follow up (friendly comments on this information), any inform acts which were not 'first mentions' of relevant information were tagged as comments with lexical tags as above. The lexical tags took the form **[topic]** where the value for topic could be any of the persona attributes in the task, and the tags were appended to the dialogue act tags for the relevant functional segments.

During the course of the pilot annotation, annotators noted that there were recurring dialogue components in extended greeting/introductions and leave-taking (henceforth GIL) sequences which could not easily be satisfactorily annotated using the set of dialogue act tags in the Social Obligations Management (SOM) dimension of the ISO standard. An example of an extended greeting and introductions sequence is shown below to illustrate the challenges in annotation:

1. A: Hi
2. B: Hello, I'm Ann. I'm from Mexico City. Yourself?
3. A: Hi Ann, nice to meet you. I'm John.

¹<https://slack.com/>

4. B: Hey John, nice to meet you too. How are you today?
5. A: Good, good. You? I'm from Paris, living in London now.
6. B: I'm in good form!.

In the above fragment there are four instances of **hello**, **hi**, or **hey**. The first two can be accounted for by the ISO scheme but the latter two cannot as there is not a 'generic' greet tag, but only `initialGreet` and `returnGreet`. The expression **nice to meet you** and response **nice to meet you too** in lines 3 and 4 are clearly formulaic greetings but it is unclear how to annotate them in the ISO standard. One somewhat unsatisfactory solution is to tag them as informs linked by rhetorical relations, but then the question arises of which dimension to place them in - the Task/Communicative or Social Obligations Management? A similar situation obtains with the **How are you today? – Good, good and You? (ellipsis of How are you?) – I'm in good form!** in lines 4-6. If the first part of these adjacency pairs are annotated as `setQuestions` and the second parts as informs or answers with the relevant rhetorical relations, these tags could be placed in the SOM dimension. However, these composite treatments of formulaic sequences are clumsy to implement during annotation and at odds with the specificity of other tags in SOM, and do not pinpoint the illocutionary force of the expressions as clearly as existing tags such as `initialGreet` and `returnGreet` do the **Hi** and **Hello** in lines 1 and 2.

To make annotation more efficient, additional acts were created in the SOM category to more easily mark such sequences and similarly problematic sequences in leave-taking sequences, and were added to the coding manual for the corpus. For greeting sequences, the new tags were **ntmy** and **repNtmy** to tag utterances such as 'It's nice to meet you', and responses such as 'Likewise' or 'Nice to meet you too', **hay** and **repHay** sequences like 'How are you?' and responses such as 'Fine.', and **greet** for extra 'Hello' and 'Hi' utterances. For leave-taking, the new tags were **wntmy** and **repWntmy** for 'It was nice to meet you' and 'It was nice to meet you too'. Table 1 shows the new acts and common examples of how they occur in the corpus.

Table 1: Acts introduced for the ADELE annotation and common surface forms

Act	Common Examples	Functional Area
ntmy	Nice to meet you	Greeting
repNtmy	Good to talk to you Nice to meet you too Good to talk to you too	Greeting Greeting Greeting
hay	How are you?	Greeting
repHay	How's it going? Fine	Greeting Greeting
greet	Hello Hi	Greeting Greeting
wntmy	It was lovely to meet you	leave-taking
repWntmy	Nice talking to you It was nice to meet you too Likewise	leave-taking leave-taking leave-taking

The entire corpus of 193 dialogues was then annotated using this expanded scheme. Conversations were annotated using a Microsoft Excel spreadsheet adapted from those on the DialogBank website. For the purposes of the following analysis six conversations were omitted due to irregularities at the beginning or end of the conversation such as participants using their real name or confusion about the workings of the interface. The GIL sequences in the remaining 187 conversations were then analysed as described below.

6 Analysis of Greeting and leave-taking Sequences in the ADELE Corpus

While there are several areas in which attention needs to be paid to the interactional or social functions of dialogue, we are focussing on greetings and leave-taking for this study. We wish to better understand the common component utterances of these sequences and investigate if additions to the ISO scheme would help provide a clearer picture and annotation of these important elements of dialogue.

GIL sections of each conversation were marked to isolate them from the body of the conversations. Greeting sections were marked as beginning with the first utterance of the conversation, and ending with the last production of a formulaic greeting/introduction or greeting/introduction response. leave-taking sequences were marked from the first attempt to close the conversation to the final utterance of the conversation.

The annotated data set contained 40,297 words over 9231 turns or ‘utterances’ where a turn was defined as the text entered before a user pressed return. The vast bulk of utterances were tagged with a single label (7811 or 84.7%), 1209 (13%) had two tags, 181 (2%) had three tags, while 26 (0.3%) and 3 utterances had four and five tags respectively.

Table 2: Greeting, Introduction, and Leavetaking (GIL) Acts in ADELE corpus

Description	Count	% Corpus
All acts included in GIL sequences (GILseq)	2336	21.5
GILA: Only GIL Acts: GILseq Acts - Interloper Acts	1820	16.7
GILB: Only GIL acts without LeaveTaking Introductions: GILA - Leavetaking Introductions	1626	15
Social Obligation Management Acts (SOM) other than GIL	198	2

There were 10889 dialogue act tags of which 2336 or 21.5% were included in GIL sequences as defined above. Table 2 shows the counts for Greeting, Introduction, and Leavetaking acts in the corpus. 1329 tags related to greeting sequences and the remaining 1007 related to leave-taking sequences. It should be noted that GIL sequences sometimes contained other acts unrelated to greeting, introduction, or leave-taking, as can be seen in the above example where **I’m from Mexico City. Yourself?** in line 2 are an inform[city] and setQuestion[city] related to the task. The question is answered on line 5 near the end of the greeting/introduction sequence. The number of dialogue acts directly involved in greeting/introduction and leave-taking sequences was calculated by disregarding the ‘interloping’ acts related to functions other than greeting/introductions and leave-taking. Greeting/introduction alone accounted for 1034 labels, while leave-taking alone accounted for 786 labels, making a total of 1820 acts of greeting/introduction and leave-taking which account for 16.7% of all dialogue acts tagged in the corpus. The leave-taking totals include 194 instances of leave-taking Introductions – utterances which introduce the closure of the dialogue. These utterances could be included in the Discourse Structuring dimension, in which case the total for GIL drops to 1626 or 15% of all dialogue act labels. This 15% is the most conservative estimate of the proportion of GIL tags in the corpus. The total SOM acts in the corpus including SOM categories outside GIL from the ISO standard amounts to 1824 or 17%.

In terms of the prevalence of the individual greeting tags introduced during annotation, in 187 conversations there were 495 new tags – the hay (How are you?) tag appeared 68 times, the ntmy (Nice to meet you) tag appeared 101 times, and the extra greet tag appeared 66 times (each conversation contained two initialGreets). The response tags repHay and repNtmy appeared less frequently, with 49 instances of repHay and 25 of repNtmy. For the leave-taking tags, there were 139 wntmy (It was nice to meet you) tags and 47 repWntmy tags. These figures are summarized in Table 3.

Table 3: Distribution of new GIL acts

Act	Common Examples	Functional Area	Count
ntmy	Nice to meet you	Greeting	101
repNtmy	Nice to meet you too	Greeting	25
hay	How are you?	Greeting	68
repHay	Fine	Greeting	49
greet	Hello	Greeting	66
wntmy	It was lovely to meet you	leave-taking	139
repWntmy	It was nice to meet you too	leave-taking	47

7 Results and Applications to the ISO standard

The first result of interest is the high proportion of SOM acts in the ADELE corpus, and the high contribution of GIL acts to this total. To provide context, Petukova reports percentages of SOM acts in three task-based corpora (AMI, OVIS, and DIAMOND) as ranging from 0.5 to 7.8% of total dialogue acts (Petukhova, 2011). The prevalence in the ADELE corpus is much higher. This is likely due to the more sociable nature of the interactions in ADELE. It is quite interesting that the bulk of SOM in ADELE are greetings/introductions and leave-taking. It would be very interesting to see how the GIL acts added to the tags for ADELE were accounted for in other corpora as this may account for some of the variation.

Secondly, the prevalence of the new acts introduced in the ADELE annotation, over a quarter of GIL acts encountered, would provide support for extension of the range of social acts in the ISO standard to reflect longer GIL sequences in more social dialogue.

With increasing interest in friendly interfaces, there is a need for greater understanding and more accurate modelling of social as well as task-based dialogue. There are large areas of such dialogue which are not well understood or represented in dialogue annotation schemes, ranging from simple politeness formulae, such as the greeting and leave-taking acts treated here, to larger concerns of how to represent the relationship building and maintenance functions integral to casual social talk. The annotations presented above, although preliminary in nature and from a single corpus, provide evidence that it is useful to consider a greater variety of formulaic social expressions in the greetings and leave-taking functional areas. We are currently validating our annotation scheme with naïve annotators. It is hoped that the candidate acts described above will help to inform future developments of the ISO standard to allow fuller annotation of dialogues in more social as well as task-based terms, and that their use in the development of the ADELE system will be useful to other researchers in the field of casual or social dialogue system design.

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