Financial Dialogue Games:
A Protocol for Earnings Conference Calls

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Abstract. The aim of the paper is to show the potential of applying computational models of argument in the financial domain to the analysis of Earnings Conference Calls. We propose the formal description of ECC dialogue games: its locution rules and protocol. We also test its descriptive validity on an annotated corpus.

Keywords. Financial dialogues, Dialogue protocols, Corpus analysis

1. Introduction

In this paper we take the first steps in building a protocol for Earnings Conference Calls (ECC), a genre that plays a key role in the communication between listed companies and the financial markets. Sentiment analysis techniques have been deployed to capture the tone of ECC, but their dialogical and argumentative properties have never been exploited nor deeply investigated. Here we introduce the formal description of the core exchange taking place between a corporate representative and a securities analyst in ECC. The descriptive validity of this formal analysis is then tested through a manually annotated corpus of ECC, which builds on a previous annotation effort [12]. The dialogue protocol will lay down the groundwork for future dialogue mining applications and will provide the means for testing hypotheses on the informativeness of ECC in finance. The expected significance of the extraction of dialogical and argumentative properties of ECC is twofold: (*i*) the dialogue structure of ECC could contribute to increase the accuracy of sentiment analysis (*cf.* [16,5]); and (*ii*) the manual annotation of argumentative moves in ECC already make it possible to test hypotheses on the role of argumentation in the informativeness (and hence market effects) of ECC.

1.1. Earnings Conference Calls

ECC are voluntary disclosures increasingly employed by listed companies to communicate with investors. They consist in teleconferences held by corporate leaders with financial analysts immediately following the publication of the press release containing the quarterly earnings announcement. Unlike the press release to which they relate, ECC are not compulsory disclosure activities, although they have become customary, especially for larger companies. ECC should be distinguished from the closely related genre of merger calls, which occur in relation to the announcement of a merger proposal or a takeover bid.

1.2. Related work

In finance there is a growing literature on ECC. A strand of literature focuses on trading data evidence that earnings calls are incrementally informative over the earning release, and examines variables such as abnormal trading volume and return volatility [3] during the call period. Another strand looks into the linguistic content of ECC trying to correlate linguistic and market variables, typically relying on "bag of words" sentiment analysis of conference transcripts. For instance, [13] correlates dictionary based sentiment analysis with abnormal returns and concludes that the Q&A (questions and answers) part is incrementally informative with respect to the preceding CP (corporate presentation).

A basic consideration of interactional data is found in a study such as [9], which examines the managers choice not to answer analysts questions finding evidence that it is negatively interpreted by investors. There are, however, no studies attempting to exploit more systematically dialogue structure cues. Even if researchers acknowledge that analysts' questions play "an active role in shaping a firms information environment" [10] and recognize the need of "more in-depth examinations of conference-call transcripts".

Linguistic and argumentative research on ECC is scarce. A single case argumentative analysis of a dispute between an institutional investor and a manager in a merger conference call is found in [11]. Crawford-Camiciottoli in [7] conducts a corpus study of discourse connectives whose findings are consistent with the idea that Q&A exhibit a greater degree of argumentativeness than the preceding CP. In a subsequent paper [8] she seeks to capture rhetorical strategies based on ethos in ECC through a combination of lexical corpus study and qualitative discourse analysis. A strategy further developed in [4], which combines a qualitative analysis of the genre structure with the lexical analysis of an unannotated corpus. A clear gap remains between the broad genre structure and the lexical corpus studies that only a fine grained annotation of dialogue moves can bridge. Palmieri, Rocci and Kudrautsava [12] offer a first attempt at this annotation, on which the present paper builds.

2. The data and their context

2.1. Corpus

The corpus that was collected for [12] comprises the CP part and in the Q&A part of six earnings calls (cf. Tabl. 1), announcing different quarter-over-quarter performance ($+/-$) and earning surprise ($+/=/-$). The corpus contains 73,733 words (17,451 in CP; 50,226 in Q&A) and 230 analysts question turns. Both the initial annotation for [12] and the additional annotation for this paper were conducted using UAM-Corpus Tool[1].

2.2. ECC as an activity type

In this section we describe the social context in which the activity type of ECC takes place. Contextual features of ECC have a deep impact on the shape of the dialogue game, and on the underlying information and commitment dynamics. Here we informally introduce a few elements of Rigotti and Rocci's [15] model of communication context. A more formal treatment of the activity type along the lines of this model is reserved for future stages of this project. Here we concentrate on features of the activity type that help

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[1] UAM-Corpus Tool is an environment for annotation of text corpora developed by Mick O'Donnell, freely obtainable from http://www.wagsoft.com/CorpusTool/index.html

Name of the company	Industrial sector	Surprise (earnings vs. analysts expectations)	Year-to-year Q2 2012-Q2 2013	Word length of transcript
Bank of America	Financial	+	+	13,035
Textron	Conglomerate	+	−	12,089
LaSalle	Real Estate	=	+	13,299
Steel Dynamics	Metals	=	−	13,061
Northern Trust	Financial	−	+	12,325
Novartis	Pharmaceuticals	−	−	11,463

Table 1. Composition of the Corpus

the reader to understand how ECC sharply differ from the dialogues tackled by standard dialogue systems.

Activity types, according to [15], can be analysed in terms of two components: **Interaction Scheme** and **Interaction Field**.

The Interaction Scheme is the culturally shared script orienting and bounding the interaction. The overall script of ECC consists of two main parts: (1) The corporate presentation (CP), where the managers expose in detail the quarterly results to analysts. The oral presentation is accompanied by a slideshow, featuring dense tables and charts reporting quantitative data; (2) Questions & Answers (Q&A), where the call operator opens the line and give analysts the possibility to ask questions to corporate representatives who answer immediately. This is the part for which the dialogue protocol is directly relevant.

Specific communication events precede and follow the above script. ECC are announced and preceded by press releases. They are followed by the on-line publication of the transcript of the dialogue. As for mechanisms regulating turn-taking, in ECC most participants are connected in listen-only mode, while analysts registered to speak are given the line one at a time by an operator. This means that the Q&A plays out as a sequence dialogues between one analyst and the managers.

The Interaction Field represents the institutional social reality in which the activity takes place. Activity participants have roles in the field, which consist in bundles of commitments. In particular, participants are committed to pursue certain institutional goals associated to their roles. **Corporate representatives** present at ECC include the CEO and the CFO, often the head of Investor Relations and the Chief Operating Officer. Managers of listed companies are in a relation of stewardship towards shareholders and are committed to act in their interest. The evaluation of their performance is at stake in the ECC. During the ECC, corporate representatives must act with a single voice. They share a single *commitment store*. At the start of the Q&A session, the commitment store includes all the previous disclosures of the company, but more prominently the latest *earnings release* and the *corporate presentation* preceding the Q&A.

While the **Financial Market Regulators** are not directly participating in the activity, they shape it by imposing duties on the participants. For US listed companies the Securities and Exchange Commission (SEC) regulates ECC in through the Fair Disclosure Regulation (Reg FD, 2000), aimed at preventing selective disclosure and mandating that material information is disclosed at the same time to all investors: ECC need to be publicly announced and open to public, usually in listen-only mode. The SEC also mandates the written disclosure of quarterly earnings. Most of the material information on which

the ECC revolve has already been publicly disclosed in written form by the company. As observed in [12], ECC do not appear to contain any discussion of descriptive standpoints. In fact, discussing such standpoints would amount to entertaining the possibility that company disclosures could be materially false, and thus hinting at fraud.

Securities **Analysts** work for institutional investors (buy-side analysts) or financial intermediaries (sell-side analysts). They are committed to the institutional goal of providing accurate earnings forecasts and profitable stock recommendations for their employers (buy side) or their employer's clients (sell side). This goal creates a tension between the need of critically testing the views of the managers and the need of maintaining strong relationships with them. As shown by interviews of financial analysts in [1], analysts do seek to evaluate the credibility of managers [1, p. 13], but often work under threat of being cut-off from access to top management [1, p. 18]. This tension is reflected in the dialogues: as it will appear in 3.3, analysts rarely ask directly the managers to back up their views with arguments.

3. Types of legal moves

The paper concentrates on the main fragment of the earnings conference calls, i.e. on Q&A stage. In this section, we describe a typology of legal moves for this ECC stage (Sect. 3.1); locution rules for ECC dialogue system (Sect. 3.2); and a corpus study that verifies the occurrences of locutions specified by these rules (Sect. 3.3).

3.1. Initial typology

The typology of legal moves in ECC has been created starting from the annotation schema developed by [12] for the corpus. In this section we describe the intuitive meaning of the key moves that will appear in the in locution rules (see sect. 3.2) and briefly comment on their strategic importance in ECC.
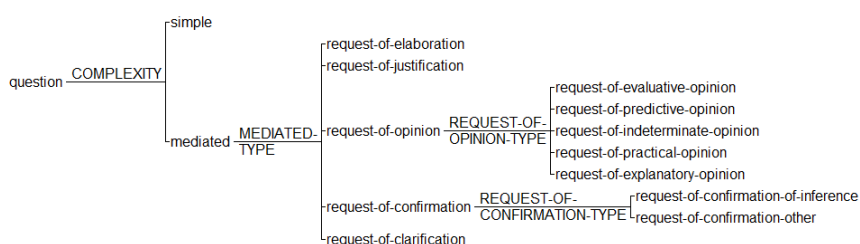

Figure 1. Annotation tree for questions in [12]

- Requests of explanation, explanatory opinions, and justified explanatory standpoints occur when analysts request managers to say what are the causes of a past event, typically to account for the financial results being reported. Causal attributions of results are not argumentative per se, as they contain causal rather than inferential relations. Managers sometimes just provide unsupported *explanatory opinions*. Often, however, explanations become the target of argumentation as *justified explanatory standpoints*. For instance, defending the attribution of bad results to external, uncontrollable, causes, may be critical for managers in order to defend their performance.
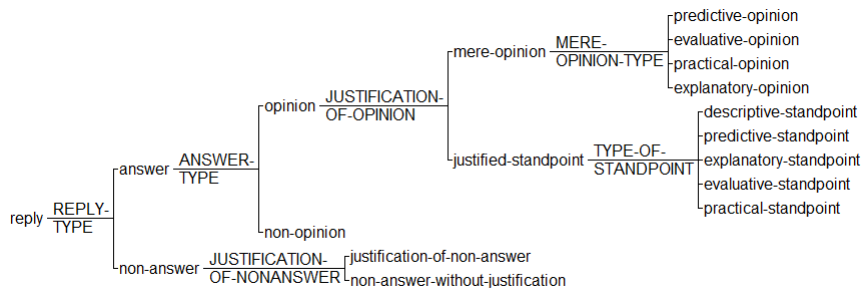
Figure 2. Annotation tree for replies in [12]

- *Requests of evaluative opinion, evaluative opinions, and justified evaluative standpoints*. Managers can be tasked to say how the evaluate a certain result, an area of their business or the state of the industry as a whole. Answers can be mere opinion or evaluative standpoints supported by arguments.

- *Requests of predictive opinion, predictive opinions, and justified predictive standpoints*. Forecasting companies' earnings is a core concern for analysts and, not surprisingly, many questions revolve on the prediction of future outcomes. Analysts usually ask about the managers'*expectations* rather than about *forecasts* leaving the door open also for answers that are mere opinions and/or that are put forward with a lower degree of commitment.

- *Requests of practical opinion, practical opinions, and justified practical standpoints* concern what the company should do in the future about a certain issue.

- *Requests of justification* are found when the managers are directly asked to produce arguments in support of an opinion they have previously expressed.

- *Requests of elaboration*: Often analysts simply ask for more *detail* or more *color* on a certain topic. Answers typically involve the disclosure of additional or disaggregated quantitative data, which were coded as *non opinion*.

- *Requests of clarification* of the meaning of a preceding utterance are unsurprisingly common on both sides, given the highly technical subject matter and the rather compressed timescale of these dialogues.

- *Requests of confirmation of inference* represent a move type that is peculiar to ECC. Analysts interviewed in [1] report the importance of "checking their logic" with corporate representatives. Often the analyst will produce an argument supporting some standpoint, asking whether they agree with that line of reasoning. In their answers managers can confirm the analyst's argument, refute it, or "edit" it.

3.2. Formal description

In this paper, we propose a formal dialogue system [17] for sub-games in earnings conference calls, called sub-ECC, which specifies rules for the Q&A stage, with some simplifications (see Sect. 4.1 for more details). We use the typology introduced in 3.1 to specify locution rules for this echange of information type of a game [6]. Excluded from the formal system are the categories which appear in the annotation tree as auxiliary types (such as *request of indeterminate opinion* or *descriptive standpoint*). The further corpus analysis (see Sect. 3.3) confirmed that they are not used by ECC participants (i.e. N=0).

Locution rules for sub-ECC system[2]

L1 Players can use locutions belonging to a class RQ (requests) or a class RP (replies):

1. RQ is a class of any request locution of a form *RQ(φ)* or *RQ(φ since X)*, where φ is a proposition and *X* is a set of propositions; and
RQ = {RQ-just, RQ-elab, RQ-clarif, RQ-confirm-inf, RQ-OP}
2. RP is a class of any reply locution of a form *RP(φ)* or *RP(φ since X)*, where φ is a proposition and *X* is a set of propositions; and
RP = {NON-AN, non-op, MERE-OP, JUST-ST}

L2 Rules for locutions from the class RQ \ RQ-OP:

1. *RQ-just(φ)*: the speaker *S* requests to justify φ
2. *RQ-elab(φ)*: *S* requests to elaborate, i.e. give more details, on φ
3. *RQ-clarif(φ)*: *S* requests to clarify a meaning of φ
4. *RQ-confirm-inf(φ since X)*: *S* requests to confirm an inference φ *since X*

L3 Rules for locutions from the class of requests of opinion, RQ-OP = {RQ-op-eval, RQ-op-pred, RQ-op-pract, RQ-op-expl}:

1. *RQ-op-eval(φ)*: the speaker *S* requests an evaluative opinion on φ (φ refers to the past or present)
2. *RQ-op-pred(φ)*: *S* requests a predictive opinion on φ (φ refers to the future)
3. *RQ-op-pract(φ)*: *S* requests a practical opinion on φ (φ refers to an action)
4. *RQ-op-expl(φ)*: *S* requests an explanatory opinion on φ (i.e. asks about a causal explanation)

L4 Rules for locutions from the class of refusals to give an answer, NON-AN:

1. *non-an(φ)*: the speaker *S* refuses to answer a question, i.e., φ means "*I will not answer this question*"
2. *non-an(φ since X)*: *S* refuses to answer a question and justifies a refusal with *X*

L5 Rule for the type of locution of non-opinion:

1. *non-op(φ)*: the speaker *S* gives data (non-opinion) φ

L6 Rules for locutions from the class of replying with a mere opinion, MERE-OP = {op-eval, op-pred, op-pract, op-expl}:

1. *op-eval(φ)*: the speaker *S* gives his opinion φ which is the evaluation of a past or present state of affairs
2. *op-pred(φ)*: *S* gives his opinion φ which is the prediction of a future state of affairs
3. *op-pract(φ)*: *S* gives his opinion φ which describes what action should be undertaken
4. *op-expl(φ)*: *S* gives his opinion φ which is the explanation of causal relation

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[2]We use symbols in italics to denote locutions, e.g. *RQ*, and corresponding symbols in non-italics to denote sets of locutions, e.g. RQ. That is, RQ refers to a class of any request locution of a form *RQ(φ)* or *RQ(φ since X)*, e.g. *RQ-op-eval(φ)*, *RQ-just(φ)* or *RQ-confirm-inf(φ since X)*. The capital letters means locutions that might have different species, e.g. RQ-OP means that there are many types of requests of opinion. Small letters refer to a single type of locution in the typology that we use.

L7 Rules for locutions from the class of replying with a standpoint and its justification, JUST-ST = {st-eval, st-pred, st-pract, st-expl}:

1. *st-eval(φ since X)*: the speaker *S* gives his evaluative opinion *φ* and justifies it with a set of premises *X*
2. *st-pred(φ since X)*: *S* gives his predictive opinion *φ* and justifies it with *X*
3. *st-pract(φ since X)*: *S* gives his practical opinion *φ* and justifies it with *X*
4. *st-expl(φ since X)*: *S* gives his explanatory opinion *φ* and justifies it with *X*

3.3. Corpus study

In this section, we describe the frequency of occurrences of locutions (see Tabl. 2), looking at how participants typically behave in sub-ECC dialogue games. Observe that in the RQ class, the most popular locution is request of opinion (51.47%). Surprisingly, the class of request of justification holds almost the last place with 6.47% (only RQ-clarif is less frequent). This could suggest that argumentation does not play an important role in the dynamics of sub-ECC dialogues. Such a conclusion, however, turns out to be hasty, if we look at the distribution of reply locutions. Its most frequent category is the justificatory standpoint. This means that some of the opinions delivered as a response to RQ-OP has to be supplemented with a justification (this observation corresponds to the protocol rules **P3.2–P3.5**, see Sect. 4.1).

[Table 2a.]	Rule	N	Percent		[Table 2b.]	Rule	N	Percent
RQ	**L1.1**	**340**	**100%**		**RP**	**L1.2**	**411**	**100%**
RQ-just	**L2.1**	**22**	**6.47%**		**NON-AN**	**L4**	**29**	**7.05%**
RQ-elab	**L2.2**	**100**	**29.41%**		*-without just.*	L4.1	4	13.79%
RQ-clarif	**L2.3**	**10**	**2.94%**		*-with just.*	L4.2	25	86.2%
RQ-confirm-inf	**L2.4**	**33**	**9.7%**		**non-op**	**L5**	**59**	**14.36%**
RQ-OP	**L3**	**175**	**51.47%**		**MERE-OP**	**L6**	**57**	**13.87%**
RQ-op-eval	L3.1	45	25.72%		*op-eval*	L6.1	11	19.3%
RQ-op-pred	L3.2	79	45.14%		*op-pred*	L6.2	27	47.37%
RQ-op-prac	L3.3	18	10.29%		*op-prac*	L6.3	2	3.5%
RQ-op-expl	L3.4	33	18.57%		*op-expl*	L6.4	17	29.82%
					JUST-ST	**L7**	**266**	**67%**
					st-eval	L7.1	117	43.98%
					st-pred	L7.2	80	30.07%
					st-prac	L7.3	19	7.14%
					st-expl	L7.4	50	18.8%

Table 2. The verification of locution rules of the *sub-ECC* dialogue system: (a) number of occurrences N for request locutions; (b) number of occurrences N for reply locutions

The most popular types of requested opinion were predictive (45.14%) and evaluative (25.72%). The responses followed this tendency, i.e. the number of occurrences of op- and st-eval is the highest (N=128) followed by op- and st-pred (N=107). This fits with the goal of the ECC type of the dialogues as discussed in 2.2: analysts *evaluate* the past performance of the company and *forecast* future earnings and stock price.

Finally, observe that non-opinions, which are not considered in standard formal dialogue systems, are as frequent as mere opinions (14.36% vs. 13.87%). This also nicely

fits with the specific nature of ECC games. Both parties engaged in a dialogue are interested in data – companies are providing information in order to convince analysts that their company will make high profit, and analysts are looking for information which will allow them to decide whether the company is worth investing in.

4. Protocol of interaction

In this section, we introduce a normative specification of how the players should interact during Q&A (Sect. 4.1). A protocol is constructed using the definitions of locutions specified in the rules L1–L7. Then, we empirically test the correctness of this formal description (Sect. 4.2).

4.1. Formal description

The sub-ECC dialogue system specifies such a fragment of the ECC protocol in which two players exchange locutions during Q&A: an analyst, *A*, and a corporate representative, *C*. Using the definitions of locutions specified in L1–L7 (see Sect. 3.2), we require that legal interactions between *A* and *C* have to satisfy the rules P1–P4.

Protocol rules for sub-ECC system

P1 Rules of turns:

1. Each player contribute a locution at a time, in turn
2. The player *A* moves first
3. *A* is allowed to perform locutions from the class RQ, *C* is allowed to perform locutions from RP∪{RQ-clarif}

P2 Rules of interaction for types of locutions from the class RQ \ RQ-OP:

1. for each locution from the class RQ: after *RQ(φ)* or *RQ-confirm-inf(φ since X)*, the player *C* can reply with a locution from NON-AN of the form *non-an(ψ)* or *non-an(ψ since Y)*, where ψ means *"I will not answer this question"* and *Y* is a set of premises that justifies a refusal to respond
2. after *RQ-just(φ)*, *C* can reply *JUST-ST(φ since X)*, where *X* is a set of premises that justifies φ
3. for RQ \ {RQ-just; RQ-confirm-inf}: after *RQ(φ)*, *C* can reply:

    (a) *non-op(ψ)*, where ψ is a data that specifies φ
    (b) *MERE-OP(ψ)*, where ψ is an opinion on φ
    (c) *JUST-ST(ψ since X)*, where ψ is an opinion on φ and *X* is a set of premises that justifies an opinion

4. after *RQ-confirm-inf(φ since X)*, *C* can reply:

    (a) *non-op(ψ)*, where ψ is data that confirms φ
    (b) *JUST-ST(φ since X)*
    (c) *JUST-ST((not φ) since Y)*

5. for RQ \ {RQ-clarif}: after *RQ(φ)*, any player can reply: *RQ-clarif(φ)*

P3 Rules of interaction for the locutions from the class RQ-OP (where ψ will mean an opinion on φ, and *X* – a set of premises that justify the opinion):

1. after *RQ-OP(φ)*, the player *C* can reply:

   (a) NON-AN of the form *non-an(ψ)* or *non-an(ψ since X)*, where *ψ* means *"I will not answer this question"* and *X* justifies a refusal to respond
   (b) *RQ-clarif(φ)*

2. after *RQ-op-eval(φ)*, *C* can reply: (a) *op-eval(ψ)*; (b) *st-eval(ψ since X)*
3. after *RQ-op-pred(φ)*, *C* can reply: (a) *op-pred(ψ)*; (b) *st-pred(ψ since X)*
4. after *RQ-op-pract(φ)*, *C* can reply: (a) *op-pract(ψ)*; (b) *st-pract(ψ since X)*
5. after *RQ-op-expl(φ)*, *C* can reply: (a) *op-expl(ψ)*; (b) *st-expl(ψ since X)*

P4 Rules of interaction for a class AN: after a locution belonging to a class AN, the player *A* can reply with any locution from RQ

The dynamics of a sub-game for this dialogic genre is as follows. The player *A* is allowed to perform request locutions RQ, and *C* – reply locutions RP with the only exception that the representative may ask for the clarification of meaning for requests advanced by *A* (see the rule **P1.3**). Requests can have two types of "unintended" or "suspended" replies: (1) non-answer, **P2.1** and **P3.1a**; or (2) request of clarification (with the exception of responding to RQ-clarif), **P2.5** and **P3.1b**. Such a response is not typical for standard accounts of dialogue protocols, but is quite frequent in this genre. The player *C* might refuse to respond, since the company or its partners treat requested information as confidential (see ex. (1)) or Regulation Fair Disclosure does not allow to disclose such information at the moment.

(1) a. Stephen E. Levenson: *Okay. And last, what stage are you on partnering on the V-280? Or is it a little premature for that still?*
     b. Scott C. Donnelly: *We have a number of partners that are part of the V-280 program. And to be honest, I don't know how much we've publicly announced. So I got to be careful here that I don't announce something we haven't announced.*

Moreover, both players can always respond with the request of clarification of meaning, if they do not understand what has been said in the previous turn. We prohibit responding with RQ-clarif for the requests of clarification to avoid "looping" when speakers prolong the conversation by subsequently asking the opponent to clarify what he meant.

According to the remaining rules, the actual responses given by *C* should correspond to the intended responses assumed in *A*'s request. That is, requests for opinions cannot be responded with non-opinion **P3**, but they should be followed by a specific type of opinion – either without (**P3.2a–P3.5a**) or with justification (**P3.2b–P3.5b**). Request of justification, on the other hand, cannot be responded without justification **P2.2**, i.e. *C* is not allowed to give data (non-op) or non-justified opinion (MERE-OP). For RQ-just, the premises support the same opinion that was advanced in RQ-just (similarly as in a standard *why(φ)* move).

When *A* is asking for clarification or elaboration, *C* can respond with any locution (**P2.1** and **P2.3**). For example, for RQ-elab the response of non-opinion means that *C* elaborates on an issue by giving some additional data, while mere opinion – by offering his opinion on this issue. Unlike in the case of RQ-just (and unlike in standard models), when these types of requests are followed by JUST-ST, the player *C* is not using the same propositional content that was advanced in the request. For example, *RQ-elab(φ)*,

should be followed by *JUST-ST(ψ since X)*, and not by *JUST-ST(φ since X)*, **P2.3c**. The rationale is that if *A* asks for justification, he wants an opinion about which he asked to be justified, but if he asks for elaboration, then he, first of all, wants *C* to introduce new information, **P2.3a**, or new opinion, **P2.3b**, which can additionally be strengthen with the justification, **P2.3c**. The locution RQ-confirm-inf should be followed by some sort of confirmation of inference: either provided by additional data **P2.4a**, or simply by the repetition of the given inference **P2.4b**. The representative can also disagree with the inference by stating the inference with a rebutted conclusion, **P2.4c**. Finally, after *C*'s response the analyst is allowed to continue asking questions without any restrictions, **P4**.

4.2. Corpus study

In this section we present quantitative and qualitative corpus analysis of the protocol introduced in the paper, testing empirically the correctness of our formal description of interaction in sub-ECC games. The corpus consists of four transcripts for companies: Textron, Steel Dynamics, Northern Trust and Novartis. The total number of interactions analysed in the corpus is 260 (Tabl. 3). Note that the corpus for protocol analysis is smaller than the corpus for locution rules in Sect. 3.3. The task required the laborious manual annotation of pairs of adjacent locutions in UAM-Corpus Tool. A limitation that we hope to overcome in future work.

	TO TAL	RQ -just	RQ -elab	RQ -clar	RQ -conf -inf	RQ -OP	-eval	-pred	-prac	-expl
TOTAL		**12 (5)**	**91 (35)**	**7 (3)**	**20 (8)**	**130 (50)**	30 (12)	58 (22)	14 (5)	28 (11)
NON-AN	**15(6)**		**4(1.9)**			**11(4)**	4(1.9)	4(1.9)		3(1.5)
w/o just	3(1.5)					3(1.5)	2(.8)			1(.4)
w just	12(5)		4(1.9)			8(3)	2(.8)	4(1.9)		2(.8)
non-op	**35(14)**		**24(9)**	**2(.8)**	**5(2)**	**4(1.9)**		3(1.5)	1(.4)	
MERE-OP	**41(16)**		**14(5)**		**1(.4)**	**24(9)**	4(1.9)	10(4)	2(.8)	8(3)
op-eval	8(3)		3(1.5)		1(.4)	3(1.5)	3(1.5)			
op-pred	19(7)		8(3)			10(4)		10(4)		
op-prac	2(.8)					2(.8)			2(.8)	
op-expl	11(4)		3(1.5)			8(3)	1(.4)			7(3)
JUST-ST	**168 (65)**	**12 (5)**	**49 (19)**	**5 (2)**	**12 (5)**	**90 (35)**	21 (8)	41 (16)	11 (4)	17 (7)
st-eval	63(24)	7(3)	22(8)	5(2)	4(1.9)	24(10)	19(7)	1(.4)	2(.8)	2(.8)
st-pred	52(20)	2(.8)	9(3)		4(1.9)	37(14)		36(14)	1(.4)	
st-prac	15(6)		7(3)			8(3)			8(3)	
st-expl	38(15)	3(1.5)	11(4)		4(1.9)	20(8)	2(.8)	3(1.5)		15(6)
RQ-clar	**1(.4)**					**1(.4)**	1(.4)			

Table 3. The verification of protocol rules of the *sub-ECC* dialogue system: number of occurrences for each rule P1–P4 (in brackets, we give a percentage; dark grey means illegal replies)

The most frequent interactions are the exchange of RQ-OP and JUST-ST (35% of all the interactions), while the exchange RQ-just and JUST-ST is relatively rare (5%). This

confirms the tendencies observed in Sect. 3.3 that argumentation is most often triggered indirectly. Requests of opinion were also quite often followed by *NON-AN* which is not accounted for in standard dialogue systems.

16 instances constitute illegal replies. This means that the protocol proposed in this paper was followed in 94% during the real earning conference calls. Observe that the main discrepancy between data and the normative description of ECC interactions has been encountered in three cases: (1) when request of non-explanatory opinion is followed by explanatory opinion or standpoint (N=6; 12% of all 49 replies with op-expl or st-expl); (2) when request of non-evaluative opinion is followed by evaluative standpoint (N=5; 8% of all 63 replies with st-eval); and (3) when request of opinion is followed by non-opinion (N=4; 11% of all 35 replies with non-op).

The qualitative assessment was further used in order to pursue the possible reasons of illegal replies. We identified two repeating patterns that caused discrepancies. First reason seems to be a result of complexity of replies, or more specifically - the indexicality of its parts such as in ex. (2).

(2)   a.   John Charles Tumazos: *Do you think that it's just a tactic by the Chinese to cause #2 or #3 grades of scrap in each metal to trade at bigger discounts so they can buy at cheaper prices? (...)* (RQ-op-eval)

        b.   Russel B. Rinn: *Yes. John, I think the driving – one of the driving factors was when the new Premier – the leader of China went out for his opening ceremony, he couldn't see the crowd. (...)* (op-expl)

Such situations are typical for the first and second case mentioned above. Observe that Rinn is first replying "*Yes*" which refers to the request of evaluative opinion. It is later that he moves to explanatory opinion, i.e. he starts to *explain* the evaluative opinion that he conveyed through the indexical locution "*Yes*". In order to be able to capture such a dialogical features, we need to extend the expressiveness of our model (e.g. Inference Anchoring Theory [14,2] can be used here).

Another reason of discrepancies is related to the third case identified above. It seems that even though an intended reply to request of opinion should be an opinion (with or without justification), the analysts seems to be satisfied with obtaining just (additional) data:

(3)   a.   Steve Scala: *What is Sandoz's view on when a biosimilar Enbrel could launch in the U.S.* (RQ-OP)

        b.   Jeffrey George: *What I can say is that we will seek to confirm bio-similarity of our biosimilar of Enbrel in patients with psoriasis and seek approval for all approved indications. (...)* (non-op)

5. Conclusions and future work

In the paper, we introduced the sub-ECC dialogue system which specifies a fragment of the earning calls in which two players, *A* and *C*, exchange locutions during Q&A. We showed that the formal system is descriptively valid, i.e. we empirically tested its locution rules and protocol on the annotated corpus. Knowing what dialogue moves managers and analysts perform and dont perform in ECC is the first step for understanding whether argumentation contributes to making ECC informative. The other key step in this line of

research is observing how the distribution of locutions and transitions is reflected first in analysts recommendations and then in market movements. Before moving to explore these correlations, however, we need to extend the protocol's specification to the full structure of ECC. In particular, such a protocol should describe the real-life situations typical for this dialogic genre in which: (1) *C* performs a series of assertions creating a set of initial commitments; (2) more than one representative is allowed to respond to a question of the analyst; (3) more than one analyst is allowed to advance questions; (4) some specific dialogical features such as indexical locutions are captured; and finally (5) other formal rules such as commitment, termination and outcome rules are specified.

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