Argument Analysis: Components of Interpersonal Argumentation

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Abstract. The aim of the paper is to propose a robust model of interpersonal argumentation (IP). The IP-arguments directly address participants of communication, i.e. they refer to speech acts rather than to propositional contents. Argumentation theory recognizes several IP-arguments, e.g. argument from position to know or *ad hominem* arguments. The model proposed in the paper enables to describe references to different types of speech acts - not only assertives, but also commissives and directives. The IP-arguments are assumed to be warranted by the component of authorizing an agent to perform a given speech act. Consequently, the wider class of IP-communication can be expressed in the extended model, such as e.g. the structure of generic *ad hominem* can be explicitly represented as the undercutter.

Keywords. argumentation structure, argumentation schemes, speech acts

Introduction

The aim of the paper is to provide a model for a structure and schemes of argumentation, which directly addresses participants of communication. That is, it contains statements that refer to an agent's speech act such as e.g. "The expert asserts that global warming is a myth", "The witness testified that the suspect was guilty". Throughout the paper, I call it interpersonal argumentation (IP) using the framework proposed in [30,29]. Argumentation theory recognizes several arguments from the IP-level, e.g., appeal to expert opinion, appeal to witness testimony or *ad hominem* arguments. The class of IP-arguments is also known as source indicators reasoning (see e.g. [26]) or ethotic argumentation [6]. The representation of IP-arguments finds application in computational models of argument, which build upon and use the concepts of argumentation's structure and schemes such as e.g. ARGUMED [22], Araucaria [17], the AIF [7], ArgDF [15] or Avicenna [16].

The standard treatment of the IP-argumentation does not account for some of its aspects. First, it allows only to describe references to assertives (such as "i asserts A" in argument from position to know), while in natural contexts also other types of speech acts are objects of reference (such as a promise). For instance, a real-life argument may have the following form "John promised he would come back, so he'll come back". The representation of this type of arguments is troublesome, since it is not clear what could be a warrant for such an inference. In the case of assertives, the fact that i is in position to know A warrants the reasoner to conclude that A (presumably) holds. Furthermore, in the standard treatment only appealing to one type of authority is describable (the appeal to the cognitive authority, i.e. to expert opinion). As a result, there is no scheme for

the appeal to an administrative authority (one who has right to exercise command or influence).

The next group of problems is related to *ad hominem* arguments. The standard representation of its basic type, i.e. GENERIC AH, does not reflect its counter-argumentative structure. That is, the attack present in GENERIC AH is not explicitly represented as a relation (denoted by an arrow in the diagram). And finally, the accusation such as "the witness i testimony is unreliable" can have an ambiguous representation, since it can be treated either as a premise of GENERIC AH, i.e. as a support for a conclusion "i's argument should not be accepted" (as assumed in [26]), or explicitly as an undercutter, i.e. as an attack against e.g. the relation between a reason and its conclusion (as assumed in DEFLOG [24]). The novelty of this paper is that I propose an extended model of interpersonal argumentation which allows to avoid those problems.

The paper is organized into two parts. The first part does not represent a contribution of this work. It describes concepts that I employ (Section 1) and the standard treatment of the IP-argumentation (Section 2). The second part of the paper introduces an extended model of interpersonal argumentation. Section 3 presents basic structure of IP-arguments and attacks on IP-components, Section 4 discusses an example of complex interactions at the IP-level, and, finally, Section 5 shows an example of applying the proposed model in the formal representation of arguments in DEFLOG.

1. Background

This section presents frameworks, which I employ to discuss and extend the model of the IP-argumentation: interpersonal level in argument analysis (Section 1.1), speech act theory (Section 1.2), and broad definition of argumentation (Section 1.3).

1.1. Interpersonal level

The first framework proposed by M. Załęska distinguishes three levels in the argument analysis: textual, ideational (related to content) and interpersonal [30,29]. Originally, this distinction was introduced by M. Halliday [10] for analyzing phenomena on the stage of an utterance. According to the hallidayan model, the interpersonal metafunction concerns the linguistic means through which the speaker participates at the communicative situation, establishing a relation with the hearer in order to influence him. Halliday includes into the interpersonal metafunction an expression of the speaker's commitments, attitudes and evaluations.

In the paper, I focus on how other's utterance is framed by a metatextual term signaling the reported speech. In particular, if an utterance refers to the performance of an agent's communicative act (e.g. his assertion, promise, etc.), then it is treated here as belonging to the interpersonal level. When such an utterance is performed in argumentation, we talk about the interpersonal argumentation. Arguments such as appeal to expert opinion, appeal to witness testimony, argument from position to know, argument from popular opinion or *ad hominem* arguments belong to the IP-level. On the contrary, arguments such as argument from sign or analogy are content-based arguments and operate within the ideational level. Observe that this concept of the IP-arguments differs from the concept of interpersonal reasoning introduced in [28]. Walton and Krabbe ex-

amined the reasoning in the context of dialogue and, as a result, proposed a taxonomy of different arguments (e.g. persuasion or negotiation dialogue). The relation between the IP-arguments and the types of dialogues remains outside the scope of this paper.

1.2. Speech acts

The second framework used in the paper is speech act theory introduced by J. Austin [2] and further developed by J. Searle [18,19] and J. Searle and D. Vanderveken [20]. I assume that a speech act $F(A)$ consists of an illocutionary force F and a propositional content A [20]. The same structure of speech acts ($claim(A)$, $why(A)$, etc.) is assumed in dialogue systems (see e.g. [14]). An illocutionary force is an intention of uttering a propositional content. For instance, John may utter A with an intention of asserting, asking, warning, promising and so on.

A speech act can be felicitous or infelicitous depending on whether or not it successfully performs a given action. For example, my act of promise that I met you yesterday is infelicitous. The rules that determine what constitutes a successful speech act are called the *constitutive rules*. In [18], Searle distinguishes four classes of those rules: (1) *propositional content rules*: some illocutions can only be achieved with an appropriate propositional content, e.g. a promise may refer only to what is in the future and under the control of a speaker, (2) *preparatory rules*: they determine what a speaker presupposes in performing a speech act, e.g. a speaker cannot marry a couple unless he is legally authorized to do so, (3) *sincerity rules*: they tell what psychological state is expressed (e.g. an assertion expresses belief, a promise expresses an intention to do something) and a speech act is sincere only if a speaker is actually in this state, (4) *essential rules*: they determine what a speech act consists in essentially, e.g. a promise commits a speaker to perform an act expressed in a propositional content. Thus, my promise that I met you yesterday was infelicitous, since I did not fulfil the propositional content condition (the propositional content does not refer to a future action).

The essential conditions are then used to build a taxonomy of speech acts. Both Austin [2] and Searle [19] proposed their taxonomies. However, throughout the paper I will use a slightly improved taxonomy by K. Bach and R. Harnish [3]. They distinguish four classes of speech acts: (1) *assertives* (constatives): they express a speaker's belief and his desire that a hearer forms a similar one, they also commit a speaker to the truth of the propositional content, e.g. claiming, conceding, testifying, deducing, arguing, denying, criticizing, rebutting, (2) *commissives*: they express the speaker's intention to do something and the belief that his utterance obliges him to do it, they also commit a speaker to do something, e.g. promising, threatening, offering, (3) *directives*: they express some attitude about a possible future act performed by a hearer and the intention that his utterance be taken as reason for the hearer's action, e.g. asking, commending, requesting, advising, (4) *acknowledgments*: they express feelings toward the hearer, e.g. apologizing, congratulating, thanking.

1.3. Broad notion of argumentation

The last concept that I adopt to represent the IP-argumentation is a broad notion of argument proposed by R. Pinto [12] and then formally specified by D. Hitchcock [11]. They claim that not only assertives may be a conclusion of argumentation. In fact, it can be any

other speech act: (1) a commissive, e.g. "I know that you don't like to stay home alone for a long time, so I promise that I'll come back soon", (2) a directive, e.g. "John felt cold, so he asked me to close the window", or (3) an acknowledgment, e.g. "My conduct was inexcusable, so I apologize most sincerely".

2. Standard model of interpersonal argumentation

In this section, I present what I will call "standard model of interpersonal argumentation". Recall that argumentation theory distinguishes several IP-arguments. In this paper, I limit the considerations to argument from expert opinion, argument from position to know, and the basic type of *ad hominem* argument - GENERIC AH.[1] Section 2.1 presents Walton's account of IP-argumentation schemes. Section 2.2 shows how the IP-arguments are diagrammed and formalized in Verheij's ARGUMED and DEFLOG.

2.1. Walton's schemes of IP-argumentation

In D. Walton's model, position to know and expert opinion arguments are represented by the following schemes and critical questions (see e.g. [25,27]):

ARGUMENT FROM POSITION TO KNOW
i is in a position to know whether A is true or false.
i asserts that A is true (false).
Therefore, A may plausibly be taken to be true (false).

(CQ1) Is i in a position to know whether A is true (false)?
(CQ2) Is i an honest (trustworthy, reliable) source?
(CQ3) Did i assert that A is true (false)?

ARGUMENTATION SCHEME FOR APPEAL TO EXPERT OPINION
(Major premise) Source i is an expert in domain D containing proposition A.
(Minor premise) i asserts that proposition A (in domain D) is true (false).
Therefore, A may plausibly be taken to be true (false).

(CQ1) Expertise critical question: How credible is i as an expert source?
(CQ2) Field critical question: Is i an expert in the field that A is in?
(CQ3) Opinion critical question: What did i assert that implies A?
(CQ4) Trustworthiness critical question: Is i personally reliable as a source?
(CQ5) Consistency critical question: Is A consistent with what other experts assert?
(CQ6) Backup Evidence critical question: Is i's assertion based on evidence?

GENERIC AH is specified as follows ([26]: 249):

ARGUMENTATION SCHEME FOR GENERIC AH
i is a bad person.
Therefore, i's argument α should not be accepted.

(CQ1) Is the premise true (or well supported) that i is a bad person?
(CQ2) Is the allegation that i is a bad person relevant to judging i's argument α?

[1] For the specification of other IP-arguments the reader is referred e.g. to [27].

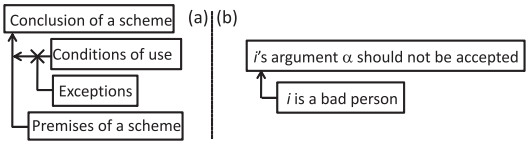

Figure 1. The argumentation schemes in ARGUMED: (a) a general form, (b) GENERIC AH.

(CQ3) Is the conclusion of the argument α should be (absolutely) rejected even if other evidence to support α has been presented, or is the conclusion merely (the relative claim) that α should be assigned a reduced weight of credibility, relative to the total body of evidence available?

2.2. Verheij's ARGUMED *and* DEFLOG

B. Verheij proposes the logical system DEFLOG, which allows to analyze prima facie justified assumptions [24]. These assumptions are not treated as definitely true, but are allowed to be defeated by some additional information. This corresponds to the idea of defeasible reasoning, what enables to link together Verheij's formalization and (defeasible) argumentation schemes [23]. The argumentation schemes are visually represented in the automated argument assistant ARGUMED based on DEFLOG [22]. This section gives a brief overview of Verheij's proposal.

In [23], Verheij introduces a method for formal analysis of argumentation schemes. The basic components of a scheme are its premises and conclusion. Additionally, each scheme has its *condition of use*, which corresponds to Toulmin's warrant [21], and Pollock-style [13] undercutting *exceptions of use*, which block the use of the scheme (Fig. 1a). Verheij also proposes how to diagram GENERIC AH (Fig. 1b).

DEFLOG's language has two connectives: dialectical negation $\times$, and primitive implication $\rightsquigarrow$. The dialectical negation $\times\varphi$ expresses that the statement φ is defeated. When the dialectical negation of a prima facie justified assumption is (actually) justified, the assumption is not actually justified, but defeated. The primitive implication $\varphi \rightsquigarrow \psi$ expresses elementary conditional relations, which can be a subject of attack or defeat. It only validates Modus Ponens. In DEFLOG, a warrant and an undercutter are treated as the support and, respectively, attack of the relation between a reason and its conclusion. Thus, a warrant corresponds to condition of scheme's use and is expressed by $\varphi \rightsquigarrow (\psi \rightsquigarrow \chi)$, while an undercutter corresponds to an exception of scheme's use and is expressed by $\varphi \rightsquigarrow \times(\psi \rightsquigarrow \chi)$.

Consider the example from [23]. Suppose that we have two prima facie assumptions:

$\texttt{testimony}$,
$\texttt{testimony} \rightsquigarrow \texttt{guilty}$,

where "$\texttt{testimony} \rightsquigarrow \texttt{guilty}$" means that there is a witness testimony that implies the suspect's guilt. The application of Modus Ponens arrives at a conclusion that the suspect is guilty. Now, two additional prima facie assumptions are introduced:

$\texttt{unreliable}$,
$\texttt{unreliable} \rightsquigarrow \times(\texttt{testimony} \rightsquigarrow \texttt{guilty})$,

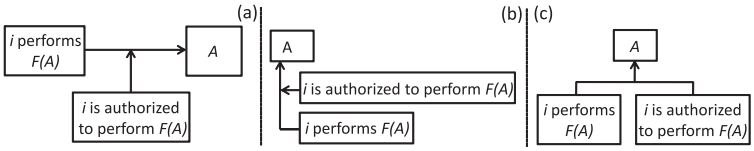

Figure 2. The basic components of the IP-argumentation diagrammed according to: (a) Toulmin's model, (b) ARGUMED, and (c) Walton's model.

where "`unreliable`" means that the testimony is unreliable, and the second sentence expresses that if the witness testimony is unreliable, it is defeated that the testimony implies the suspect's guilt. Now, if the four assumptions are assumed to be prima facie justified, the prima facie assumption that the testimony implies guilt, is defeated, and it does not follow that the suspect is guilty.

The standard model of the IP-argumentation has some limitations. The next sections discuss those problems and propose an extension, which allows to avoid them.

3. Basic structure of IP-argumentation in the extended model

In this section, I propose the model for the basic components of IP-argumentation and for two types of interactions among them: support (Section 3.1) and attack (Section 3.2).

3.1. Relation of support

Following the specification of argument proposed by Pinto and Hitchcock (see Section 1.3), I assume that the argumentation may include different speech acts. However, I extend this approach by allowing not only a conclusion, but also a premise to be a speech act. Such an extension is implicitly assumed by, e.g., Walton's model of argument from position to know, where one of the premises is *assertive* "i asserts A", e.g. "John says that it is raining, so it is raining". I consider two further types of speech acts as premises: *commissives*, e.g. "John promised he would come back, so he'll come back", and *directives*, e.g. "John commanded me to close the window, so I should close the window". In this paper, I do not consider the acknowledgment class of speech acts.

A conclusion of the IP-argumentation will be true or accepted as true, if the intention of a speech act is satisfied. Following Bach and Harnish's taxonomy of speech acts (see Section 1.2), a conclusion for an assertive will be accepted by a hearer (I will accept that it is raining), when the hearer takes the speaker's commitment as reason to form a similar belief (I will treat John's commitment as a reason to believe that it is raining). A conclusion for a commissive will be accepted by (I will accept that John will come back), when the hearer takes the speaker's commitment to an action as reason to form a belief about that action (I will treat John's commitment to come back as a reason to believe that John will come back). A conclusion for a directive will be accepted by a hearer (I will accept that I should close the window), when the hearer takes the speaker's utterance as reason for his action (I will treat John's command as a reason to close the window).

Whether or not a hearer takes a speaker's utterance as reason for belief or action is determined by the *constitutive rules* for performing illocutionary acts (see Section 1.2). In other words, the hearer has to give the speaker an *authorization* to perform a given speech act. For example, I will accept that it is raining on the basis of John's assertion

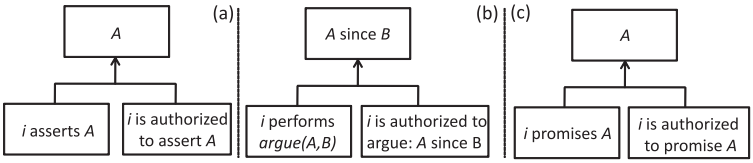

Figure 3. IP-arguments with: (a) a simple assertive, (b) a compound assertive $argue(A, B)$, and (c) a commissive $promise(A)$.

that it is raining, if I think he is authorized to make assertions with respect to the weather. In particular, I can give him an authorization on the ground of sincerity condition, since I think that he declares his actual belief. Similarly, I will accept that John will come back on the basis of his promise, if I think he is authorized to make promises with respect to his coming back. In particular, I may give him an authorization on the ground of propositional content conditions, since I think that this action is under his control.

The component of authorization can be viewed as a warrant of IP-arguments in Toulmin's sense [21] (see Fig. 2a). In Verheij's model, the warrant refers to the *condition of use* (see Fig. 2b).[2] Finally, it corresponds to the *major premise* in Walton-like argumentation scheme (see Fig. 2c).

The proposed IP-model is easily reducible to the traditional approach, where only assertions are allowed. To this end, I consider only one type of speech acts: $F(A)$, in which F belongs to assertives. The interesting question is what assertives should be allowed in such IP-argumentation. The narrow approach is to allow only $F(A)$, where F can have a form such as $assert$, $claim$, $affirm$, $state$, $assure$, $inform$, $report$, etc. (Fig. 3a). This type of IP-arguments corresponds to the argument from position to know. On the other hand, we could allow F to be an assertive $argue$, which according to Segmented Discourse Representation Theory (SDRT) [1] has relational characterization, i.e. F refers to a pair of propositional contents. Then, the speech act of arguing has a form: $argue(A, B)$ (Fig. 3b). This type of assertive can be also denoted as $argue(A)$, where A is composed of $prem(A)$, i.e. the set of premises of A, and $conc(A)$, i.e. a conclusion of A (see e.g. [14]). The rules, which determine whether a hearer gives a speaker authorization to perform $argue$, are explored by F. van Eemeren and R. Grootendorst as identity and correctness conditions [9]. Finally, since the extended model takes into account the speech acts, which belong to commissives or directives, IP-arguments can have also a form such as in Fig. 3c.

3.2. Attacks on IP-components

Attacks on the components of IP-arguments are expressed by different *ad hominem* arguments. In this section, I explore the limitations of the standard representation of AH and propose its modifications. I describe the proposal on the basic type of *ad hominem*, i.e. on GENERIC AH.

AH arguments attack a speaker's authorization to perform a given speech act or more generally they try to discredit an agent as a rightful participant of the social discourse.

[2] Observe that in Verheij's approach the selection of "condition of use" for a scheme is somehow arbitrary. It means that we could assume alternative condition of use: "If i perform $F(A)$ and i is authorized to perform $F(A)$, then A". In the paper, I focus on the simpler option.

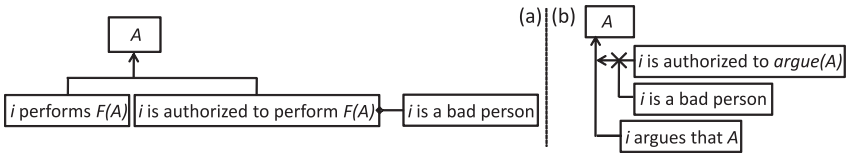

Figure 4. GENERIC AH in: (a) a Walton-like model, (b) ARGUMED.

The first limitation of the standard treatment is that it focuses on questioning an agent's right to perform a speech act *argue*, while in natural contexts any speech act may be questioned. Second, the standard model does not recognize AH as counter-arguments, at least not at their structural level. Attacks are commonly modeled by means of a relation on a set of arguments (denoted by arrows in the diagram), such as e.g. in Dung's [8] abstract framework. In Walton's model, the GENERIC AH attack is not explicitly represented, but only "reconstructible" from the content of its premise and conclusion: they describe that someone attacked other agent ("you are a bad person") questioning his argument ("your argument should not be accepted").

Let us start with the second limitation. It is not clear how to understand that i's argument should not be accepted. One reasonable interpretation is that i's conclusion is not rejected, but "undermined". Thus, the attack's effect may be viewed as similar to the effect that undercutters have, i.e. i's conclusion is not accepted since e.g. the inferential link between the premise and the conclusion is blocked.[3] If this is the case, then the GENERIC AH attack "i is a bad person" is directed at the component "i is authorized to perform $F(A)$" (Fig. 4a). Moreover, since in Verheij's model the component of authorization constitutes the condition of use, then GENERIC AH becomes an exception of use. That is, the attack "i is a bad person" is an exception to use i's authorization as a warrant for accepting i's argument A (Fig. 4b).

In order to avoid the first limitation of the standard treatment, we should allow GENERIC AH to attack authorization to perform any speech act. In particular, i's right can be diminished to perform the complex assertive: $argue(A)$. This case corresponds to Walton's account where the effect of *ad hominem* is to not accept i's argument. Moreover, GENERIC AH is allowed to attack also simple assertives such as: $claim(A)$, as well as commissives or directives. In the future work, I plan to consider the possibility of representing the IP-type of attacks in Dung's framework.

4. More complex IP-structures: appeal to expert opinion

The extended model enables to enrich the standard treatment of appeal to expert opinion in several manners. First, it allows to capture the distinction between two types of authorities to which arguments may appeal: *cognitive* (*de facto, epistemic*) *authority* and *administrative* (*de jure, deontic*) *authority*. Walton recognizes the ambiguity of "authority" as a problem, since it may disturb the analysis and evaluation of the acceptability of a given appeal to an authority ([25]: 76–79). Therefore, in such cases it is important to allow these types of authorities to be explicitly represented in the diagram. The *cognitive*

[3] At this point, we do not need to decide how to precisely specify a goal of undercutter: as an inferential link [13], a generalization [5], or a premise [4].

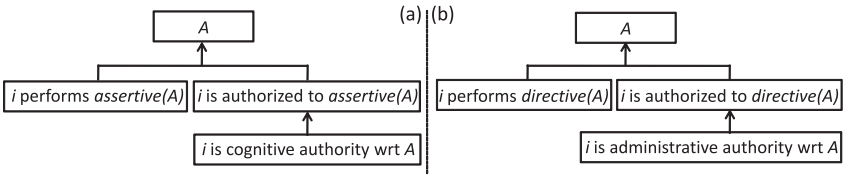

Figure 5. Two types of authority: (a) cognitive (expert), (b) administrative.

authority refers to a relationship between two agents where one (say i) is an expert in a field of knowledge and i's pronouncement in the field have a special weight (importance) for the other agent. This could be narrowly interpreted as appealing to i's simple assertive such as $claim(A)$. That option corresponds to Walton's argumentation scheme for appeal to expert opinion. The broader interpretation would allow to appeal to any i's assertive including the complex ones such as $argue(A)$ (see Fig. 5a). The *administrative authority* refers to a relationship between two agents where i has a right to exercise command or influence. Depending on applications, we can allow only some directives to be involved in this type of appeal, i.e. those that have a high degree of strength of the illocutionary point[4] (such as $command(A)$, $require(A)$, $forbid(A)$), or any i's directive including e.g. $ask(A)$ (in some applications in multi-agent systems, it may be assumed that only some agents have a right to query; then, those agents could be treated as possessing the administrative authority). The latter option is diagrammed in Fig. 5b.

Next, observe that some of critical questions in the argument from expert opinion seem to be very general, i.e. not specific for the case of expert (applying also to witness testimony etc.) such as trustworthiness critical question, while other critical questions are directly related to the properties of expertise such as field critical question. This intuition can be represented with the use of the extended model. In Fig. 6, the argument from expert opinion is diagrammed according to ARGUMED. Suppose that someone refers to Bob's assertion that A holds, and treats Bob as an expert with respect to A. How may his argument be critically questioned? The first class of questions (Fig. 6a and 6b) refers to the basic IP-argument (the grey elements in Fig. 6): if Bob asserts A, then (assuming that he is authorized to make this assertion) A holds. The other class of questions (Fig. 6c and 6d) refers to the "expertise" IP-subargument that support the component of authorization (the dashed-bordered elements in Fig. 6): if Bob is an expert with respect to A, then (assuming that experts on A are authorized on A) Bob is authorized to assert A.

The questions related to the components of the *basic IP-argument* can be of two kinds. One subclass refers to questioning the basic condition of use, i.e. the authorization to perform a speech act (Fig. 6a). Trustworthiness critical question (CQ4) and backup evidence question (CQ6) belong to this subclass. Such representation will have consequences on how an attack based on this type of question is formalized in DEFLOG (see the next section). Another subclass involves questions regarding truth of the basic premise, i.e. the precision of reporting the performance of a speech act (Fig. 6b). This includes questions such as opinion critical question (CQ3). There are also two types of critical questions specific for the *appeal to authority*. One subclass refers to questioning its condition of use, i.e. the expert's authorization (Fig. 6c). This question indicates an

[4]Two speech acts can achieve the same point (aim) with different degree of strength (see e.g. [20]). For instance, asking and commanding that a hearer do something both have the point of attempting to get him to do that thing. However, the latter is stronger than the former.

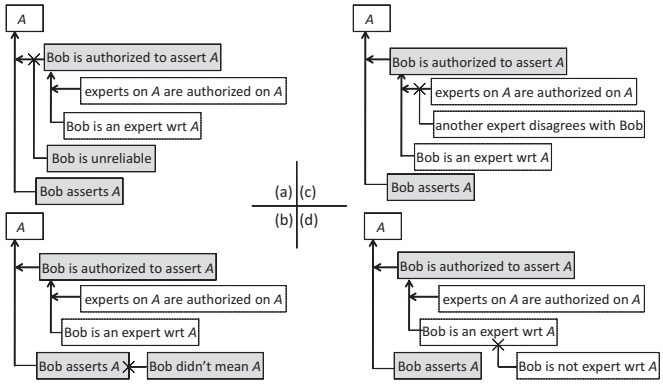

Figure 6. Classes of critical questions in argument from expert opinion, questioning: (a) the basic condition of use, (b) the basic premise, (c) the specific (expertise) condition of use, (b) the specific (expertise) premise.

exception when our trust to the expert's opinion should be suspended (or cancelled). That subclass includes consistency critical question (CQ5). The last subclass involves questions regarding truth of the premise, i.e. i's authority or expertise (Fig. 6d). This includes questions such as expertise critical question (CQ1) and field critical question (CQ2).

Finally, the extended model enables to enrich IP-argumentation schemes and critical questions such that they could refer to the broader class of communicative activities, i.e. not only to assertives, but also commissives and directives. Especially interesting is a possibility to formulate the specification for appeal to administrative authority. However, its precise elaboration needs further investigations into the essential properties of this type of authority, what is outside the scope of this paper.

5. An example of application: DEFLOG

In argumentation theory, the accusation of someone's unreliability can be treated as (non-fallacious) GENERIC AH. Consequently, DEFLOG allows the utterance "the witness is unreliable" to be formalized in two different manners. In [23], the ARGUMED diagram represents GENERIC AH as "monologic" argumentation (at least at its structural level with no attack relation, see Fig. 1b). On the other hand, in the example discussed in [23] the accusation of witness's unreliability is represented as an undercutter (see Section 2.2). In this section, I briefly show how the extended model enables to unify the formalization.

The exceptions of scheme's use correspond in DEFLOG to undercutters. Therefore, the specification of GENERIC AH proposed in the extended model allows to explicitly represent a statement "i is a bad person" as an *undercutting attack* in Verheij's sense (i.e. as an attack on the relation between a reason and its conclusion). Suppose that someone says: "Harry is a British subject, since John says so", and the other person reacts with GENERIC AH: "John is a liar". Let p be a statement that John says that Harry is a British subject, q - Harry is a British subject, and r - John is a liar. Initially, there are two prima facie assumptions:

p,
$p \rightsquigarrow q$.

At this point, it follows that q. However, the GENERIC AH attack "John is a liar" adds two other prima facie assumptions:

r,
$r \rightsquigarrow \times(p \rightsquigarrow q)$.

Now, if the four assumptions are assumed to be prima facie justified, the prima facie assumption $p \rightsquigarrow q$ is defeated, and it does not follow that q.

In DEFLOG, the *warrant* is interpreted as the support of the relation between a reason and its conclusion. Therefore, the *component of authorization* could be generally treated as φ in a formula $\varphi \rightsquigarrow (\psi \rightsquigarrow \chi)$. In the example, the warrant "John is authorized to assert that Harry is a British subject" (denoted by s) supports the relation between "John says that Harry is a British subject" and "Harry is a British subject", i.e.

$s \rightsquigarrow (p \rightsquigarrow q)$.

As a result, in the extended model GENERIC AH "behaves" in a similar manner as undercutting exceptions do. In particular, it is represented similarly to the exceptions which are determined by critical questions such as (CQ4) in argument from expert opinion. Thus, the formalization of such cases becomes unified.

Conclusions

The paper provides a model for analyzing various aspects of the interpersonal argumentation. I assume that the basic components of IP-structure are a speech act and an authorization to perform this speech act. The model allows to describe the properties of IP-arguments expressible in the standard treatment, e.g. the position to know argument from the standard model corresponds to the basic type of the IP-argumentation with speech acts limited to simple assertives.

Moreover, the model proposed in the paper enriches the standard treatment in several manners. First, it allows to infer a propositional content from any assertive, commissive or directive. For instance, the appeal to witness testimony can be treated as a subspecies of the basic type of IP-argument with an assertive of a type $testify$. The inference is warranted by the speaker's authorization to perform a speech act. The authorization is determined by the constitutive rules distinguished by Searle. Next, the attack in GENERIC AH is explicitly represented as an undercutter and *ad hominem* may attack not only the opponent's argument, but any of his speech act. Finally, the appeal to expert opinion may be represented as complex argumentation, where the "expert" subargument supports the basic IP-argument. Consequently, its critical questions divide into two classes depending on whether they refer to the basic IP-argument (such as trustworthiness critical question) or to the "expertise" IP-subargument (such as field critical question). It is also possible to express the appeal to an administrative authority.

The extended model finds an application wherever the concepts of argumentation structure and schemes are explored. In the paper, I show that it allows to treat the accusation of unreliability as GENERIC AH and, as a result, to unify the formalization in DEFLOG. Moreover, the extended model could enrich the argument analysis e.g. represented by the AIF or supported by Araucaria or ArgDF. It can be also applied in formal dialogue systems (such as e.g. [14]) to specify a new type of supports or attacks based on authorization of a participant of a dialogue to perform a move in the dialogue.

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