The Problem of Premissary Relevance

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Abstract

This paper focuses on the issue of premissary relevance as a challenge faced in health promotion interventions. To promote attitude change and influence health behavior, it is crucial that we use premises that are relevant on an individual level. Relevance in argumentation refers both to the fact that the premises should relate to the standpoint at issue, as well as the interlocutors' acceptance of these premises. We claim that autonomous argumentation systems hold the promise to enable proper argumentative exchanges that capture and address what matters to individuals. To do so, however, there is a need to consider and operationalize theories of argumentation that enable a reconstruction of the different stages of argumentation. The theory of argumentation known as pragma-dialectics can offer a promising basis for the architecture of autonomous health promotion advisors.

Andrew, the smoker

Imagine the following case. Andrew is a doctor. As part or his background, he knows all medical reports and evidence on the risks associated with smoking, and he knows a great deal about quit smoking techniques. Nevertheless, he is a smoker and has never had any intention of giving up because, as he says, it helps him relax. How do we convince Andrew to at least start to consider quitting?

People like Andrew pose particularly critical challenges to the design of health promotion interventions, especially when these interventions are prospected in the form of an automated advisor. By drawing from persuasion and argumentation theory, the aims of this paper are, first, to explain the extent of this challenge, second, to assess what conceptual solutions to this challenge are found in the literature and, third, to highlight the value of an approach to argumentation that has so far not been sufficiently considered in the field of Artificial Intelligence, namely the pragma-dialectical theory of argumentation (van Eemeren & Grootendorst 2004).

Premissary relevance

According to Kraus (1995) and a large part of the literature on persuasion, influencing behavior presupposes a change in individuals' attitudes. Andrew's positive attitude towards smoking prevents him from actually quitting and it is this attitude that we must change. But how to do this?

Rubinelli and Schulz (2006) argued in favor of an approach toward attitude change based on the use of argumentation. A promising way to enhance change is, indeed, to engage with the target-person in an argumentative exchange that focuses on those beliefs that, according to the Belief-Based Models of Attitude (Fishbein 1967), are responsible for attitude formation and to attempt to 'modify' them according to the expected outcome (in our case, to consider giving up smoking). The fact that Andrew has a positive attitude towards smoking is the result of a set of positive beliefs about it (e.g. "Smoking helps me relax"). These are the beliefs that we need to modify. But how?

The Belief-Based Model of Attitude states that, at any given time, only some of an individual's beliefs are likely to be salient and it is those that are claimed to determine one's attitude. This aspect points to at least three main strategies that can be used to influence an attitude: *firstly*, we can lead the receiver to add new salient positive beliefs about the outcome we want to achieve (i.e. 'Smoking ruins the teeth'), *secondly*, we may reinforce the favorability of an existing but not salient belief to make it salient (i.e.

Andrew's belief that 'Smoking is unhealthy') and, *thirdly*, we may decrease the belief strength associated with an existing salient belief (i.e. Andrew's belief that 'Smoking helps him relax'). In an argumentative framework this means that we can advance premises that are either in favor of the individual beliefs we want to add or reinforce, or against the individual beliefs we want to refute. Here we see the core of the challenge.

In order to be successful in our argumentative exchanges, we must use contents that for Andrew are relevant and can, thus, become salient in promoting his attitude change. While relevance can also refer to the fact that certain contents have to do with the standpoint at issue (van Eemeren & Grotendorst 2004), we use the term *personal relevance* in the sense that content is relevant if our interlocutor will accept it as an adequate support of a standpoint (Blair 1992). Our main question, here, is how to select content that will be accepted by Andrew. As also acknowledged by the Elaboration Likelihood Model (Petty & Cacioppo 1986), in fact, personal relevance is a key factor for people to engage in critical thinking about their beliefs and reasons at the origin of a behavior.

Catching what matters to individuals

Results from persuasion research highlighted some main theories that can guide us in our search of potentially relevant contents. According to Fishbein et al. (2001 and 2003) there are three main social influence theories that can be utilized to identify and address the causes of Andrew's smoking habit:

• *Health Belief Model*: it assumes that the salient beliefs are those resulting from an individual's rational appraisal of the risks, benefits and barriers to action (e.g. 'Smoking can be bad, but at the moment it is more important that it helps me relax');

• *Social Cognitive Theory*: it acknowledges the influence of individuals' social environment. It is a learning theory, based on the idea that people learn by doing what others do and that salient beliefs can result by conforming to this (e.g. 'All my friends smoke');

• *Theory of reasoned action* (TRA): it proposes that one's intention to perform or not perform a given behavior is a function of two factors: one's attitude toward the behavior in question and one's subjective norm, i.e. the perception of whether important others desire the performance or nonperformance of the behavior (e.g. 'I continue smoking because I like it and despite the fact that my wife complains about it all the time'). An extension of the TRA is represented by the *Theory of Planned Behavior* (TPB) that introduces a third predictor of behavior, namely a person's perceived ability to perform or control a behavior

(e.g. 'I know that smoking is bad, my family complains a lot about my habit, but I can't quit it. I tried, but I can't').

Beyond scientific knowledge, there are several premises we could use to address and influence possible factors that are responsible for Andrew's habit. But, again, how do we know which of the proposed theories will capture Andrew's individuality? We need an interpersonal exchange with Andrew where he discloses what is at the origin of his habit, or he gives us hints to understand it.

So far, one of the most promising ways to capture the individuality of a person in the perspective of designing an ad hoc health promotion intervention is known as *Tailoring Health Communication* (THC) (Kreuter et al. 2000). THC has been developed in an attempt to avoid the pitfalls that have compromised the effectiveness of previous mass-media based approaches, in particular the selection of a single communication approach to use with a group of people just because they share a particular characteristic. Tailored health communication is assessment-based on an individual level and enables a high individualization of communication. At the same time, it is truly a population approach that can potentially reach large populations. Scholars working on tailoring health communication with computer technology suggest that we first identify through a questionnaire those factors most likely to influence a person's motivation or ability to make whatever changes in behavior are necessary to accomplish the program's goals. Once these factors have been identified, it is possible to measure an individual's status on each of these factors and, subsequently, tailor a message to each person's unique needs based on this information.

Tailored health communication has been proven to be successful (Dijkstra 2008). Yet, autonomous argumentation systems could propose a more refined way of tailoring health communication, with potentially even a higher impact. Current THC has, indeed, two limitations that could be improved: firstly, it is not a natural way of interaction. Individuals who are in the target group of an intervention of THC must first of all answer a questionnaire that investigates their personal values, cultural norms, and social networks. When people are asked to fill out this type of questionnaire they are, to some extent, forced to think about everything that could be relevant to change behavior. Secondly, current THC does not enable argumentation in the sense of a critical discussion aimed to resolve a difference of opinion. As mentioned earlier, whenever we need to change salient beliefs or to add new beliefs and make them salient, we need argumentation. In the majority of cases, differences of opinion are solved by means of conversations, or argumentative discussions which are aimed at addressing the individual's beliefs, attitudes, and standpoints related to the health behavior at issue. As such, health interventions are aimed at educating and changing individual's viewpoints regarding certain behaviors.

Argumentation systems hold the promise to enable such an argumentative exchange through naturalistic dialogue with the persuadee. But this promise is still some way off. The interest for argumentation theory and practice in the field of Artificial Intelligence is clear. Yet, so far the main emphasis has been given to argumentation theories focused on the validity of arguments and on their soundness according to Toulmin's theory of reasoning (Bench-Capon & Dunne 2007). This emphasis is crucial in theoretical reasoning where agents try to make their beliefs fit the world. Yet, in the context of health promotion, the focus shifts from theoretical to practical reasoning. To design an autonomous argumentation system, we need theories of argumentation that, apart from looking at validity, also operationalize the dialectical dimension of a critical discussion. Thus, whereas Toulmin's model of argument schemes is focused primarily on argumentation as a *product*, it would be interesting to look into theories that also shed light on argumentation as a *process*, taking place between two discussion parties. Some research in AI proposed to use Perelman's theory (Bench-Capon & Dunne 2007). But Perelman, although he focused on the 'audience' dimension and offered a rich list of argument schemes, did not conceptualize the different stages of a critical discussion and the nature and quality of the moves that can occur there. Such an idea of discussion stages could be useful for argumentation systems, as it involves the process of defining the starting points that two opposing discussants have in common, and the way argumentation is based upon these shared starting points. This provides an insight in the way an arguer can select content which has personal relevance for the person he would like to convince. This type of conceptualization is at the basis of another theory of argumentation that so far seems to be unknown in the field of AI, namely pragma-dialectics. In the following section we highlight why pragma-dialectics is a promising theory to inform the design of argumentation systems.

Constructing argumentation through pragma-dialectics

The pragma-dialectical argumentation theory (van Eemeren & Grootendorst 2004) essentially starts from the concept of a *critical discussion* aimed at resolving a difference of opinion between two parties. In the opening example, Andrew should be regarded as one of those parties, while the health campaigner addressing his smoking habit should be considered as his opposing party. In addition, the theory presents a code of conduct for a reasonable discussion, by means of ten dialectical discussion rules that prohibit those moves that hinder the resolution process. For example, Rule 1 postulates that during the discussion, parties may not prevent each other from advancing a standpoint. Engaging in a personal attack of one's opponent constitutes a violation of this rule and is therefore considered a *fallacious* move of argumentation . In pragma-dialectics, in a similar fashion, all rule violations are considered fallacies.

Most significantly, thereby, pragma-dialectics presents us with a norm of reasonableness: arguments are deemed unreasonable if they constitute an impediment to the resolution of a difference of opinion. Such an instrumental norm of reasonableness, in pragma-dialectical terms, has advantages over theories such as Toulmin's, which state that an argument is sound when its warrant is supported by sufficient backing. While it is not always clear what could be seen as 'sufficient' backing, a norm of instrumental reasonableness consisting of a fixed set of rules provides a clear account as to what is deemed reasonable argumentation and what is not. Such a normative perspective on reasonableness can prove to be of great value when aiming to design automated models of health interventions.

Research has shown how reasonable argumentation in the pragma-dialectical sense is generally perceived by ordinary language users as more convincing than fallacious argumentation (see, for instance, O'Keefe 2003 and Van Eemeren, Garssen & Meuffels 2009). Consequently, it can be said that it is useful for health campaigners to argue in such a way that rule violations are avoided at all times. For, a campaign based on reasonable arguments is more likely to stimulate the intended behavior than a campaign using fallacious argumentation. Though obviously also other factors play an important part when it comes to influencing an individual's behavior, conviction can be seen to play a significant role in the process. If Andrew is reasonably convinced by the campaigner that the standpoint 'Smoking helps me relax' is *not* acceptable, this will result in a change of belief – a belief that can reshape his attitude and intention towards the behavior change and, subsequently, even his actual behavior.

In addition to the above, pragma-dialectics can also be regarded valuable for the field of automated intervention design as it may shed a new light upon the different stages an argumentative discussion is composed of. In the ideal model of a critical discussion, the discussants proceed through four stages: a confrontation stage, an opening stage, an argumentation stage, and a concluding stage. Each of these stages serves a specific purpose in the resolution process (see, e.g., Van Eemeren & Grootendorst 2004). Though the ideal model rarely occurs in reality in this exact form, pragma-dialecticians propose that while some argumentative moves take place in an implicit way, they can always be *reconstructed* as part of a critical discussion. In aiming to catch what matters to individuals, the opening stage is of notable importance. In this stage, it is determined which starting points are shared by both

discussants (for if you do not agree about *any* premise, there's no use in trying to resolve a difference of opinion). This often happens in an implicit way. Yet, discussants can also try to gain explicit concessions from each other, for instance, by asking each other questions. In this way, they can try to widen the 'zone of agreement' in a discussion.

Now, in order to advance an argument that will be personally relevant to the one you want to convince, it is opportune to make a selection out of the possible arguments in such a way that it maximally corresponds to the starting points that you share with your opponent. In pragma-dialectics, such a selection is considered a form of *strategic maneuvering* (Van Eemeren 2010), meaning that you try to be as rhetorically persuasive as possible while still adhering to the dialectical rules. This maneuvering – which can be regarded as a specific form of individual tailoring – can be done by (1) choosing a certain move from the topical potential of all the moves available to you at that moment, by (2) adapting to your intended audience as much as possible, and by (3) choosing certain presentational devices. In the case of choosing content that Andrew will believe to be personally relevant, a health campaigner will have to maneuver strategically with his choice from the topical potential, in such a way that he chooses arguments that correspond to the starting points that are shared between him and Andrew. In terms of the topical potential for argumentative moves, use can be made of theoretical models such as the Health Belief Model, Social Cognitive Theory, and the Theory of Reasoned Action. These theories can provide us with possible arguments regarding attitudes toward behavior, behavioral intention, risks and benefits, subjective norms, and more. To determine which of these possible arguments correspond most to Andrew's starting points, one has to look at the (reconstructed) opening stage of the discussion with Andrew and consider all of his concessions, implicit commitments and explicit statements. While a questionnaire could be reconstructed as an explicit opening stage (since Andrew's answers to the questions could be seen as concessions), it is also possible to consider implicit commitments Andrew has made, using reconstruction methods offered by speech act theory and pragma-dialectics. Also, general background information regarding Andrew, such as his age, his medical history and how long he has been smoking, can be used to distill starting points.

To Conclude

In this contribution we invite scholars active in the design of argumentation systems to address the problem of premissary relevance by exploiting the value of pragma-dialectics. Though we do not claim that this is the only theory to be used, or that it does not have any disadvantages, we do believe that it would benefit the field of Artificial Intelligence by advancing the

conceptualization of argumentation as a dynamic and dialectical process, ruled by norms of reasonableness.

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