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Repetition as a Context Selection Constraint: A Study in the Cognitive Underpinnings of Persuasion

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Repetition of information has been shown to affect the perceived validity of the items repeated with these effects carried over to an inferred assumption. We believe this is highlighted in everyday communication and can result in acceptance of fallacious argumentation. We explain this phenomenon via the notion of Context Selection Constraints and discuss the effectiveness of the *ad populum* fallacy with the help of an experimental design.

KEYWORDS: *ad Populum*, argumentation, context selection constraint, Fallacies, manipulation

1. INTRODUCTION

In this paper we conduct a theoretical and experimental investigation of the influence of repetition and *ad populum* arguments on the perceived validity of conclusions inferred from them in argumentative contexts. Building on previous work in cognitive pragmatics which provides insights on how some argumentative devices, such as fallacies, may cognitively operate (Maillat & Oswald, 2009, 2011, 2013; Oswald, 2010, 2014; Maillat, 2013a, 2013b), and inspired by recent research in cognitive psychology on repetition and familiarity of information (Ozubko & Flugelsang, 2011), we present an experimental framework

designed to bridge the gap between both disciplines. Specifically, we investigate whether the repetition of information and the mention of repetition can act as pragmatic mechanisms of contextual constraint on informational selection, as the CSC model predicts (Maillat & Oswald, 2009, 2011).

The *ad populum* argument, i.e., the use of the majority view on a given statement as definite evidence for a conclusion (see e.g. Walton, 2006, pp. 91-96), may be taken to be persuasive by virtue of its propensity to make the proposition it targets familiar: knowing that many people believe X in principle suggests that X is familiar in the community, and consequently that it would make sense for you to believe X too in that community. From a cognitive perspective, it could furthermore be argued that familiarity guarantees a greater degree of accessibility by acting as a constraint on context selection. While Ozubko & Fugelsang (2011) have shown that this can be achieved via repetition of information, we want to test whether mentioning that information has been repeated is likely to yield the same effects. Furthermore, we embed the original design within an argumentative structure as we test the transfer of the familiarity effect from a premise to the conclusion that it supports. Finally, we will hypothesise further that, as Ozubko & Fugelsang (2011) show for their memory retrieval condition, accessing an argument from memory implies that the relevant context set is perceived as more familiar. We posit that the *ad populum* argument combines these two effects (mention of repetition and retrieval from memory) to constrain context selection.

Section 2 of the paper presents the pragmatic framework used, as well as the process of Context Selection Constraint. Section 3 provides the rationale by which the account could be extended to account for argumentative phenomena and fallacies in particular. Section 4 presents the experimental design used to test our assumptions and discusses the results. We conclude by providing some directions for future research that would allow us to overcome the difficulties found in this first round of experimental research on the issue.

2. THE PRAGMATICS OF MANIPULATIVE DISCOURSE: CONTEXT SELECTION CONSTRAINT

In order to understand the framework within which we wish to analyse fallacious argumentative moves, we must first get a sense of the theoretical assumptions that underlie the kind of pragmatic model which will be entertained in the following sections, and more specifically, which grounds the principle of Context Selection Constraint

that we take to be responsible for the argumentative efficiency of fallacious arguments such as the *ad populum*.

From a traditional perspective, starting with Grice's original propositions made in the 1950s and 1960s (see the 1989 reprint), pragmatics is founded on an assumption of cooperation between the participants of a talk exchange. Grice's cooperative principle (Make your contribution such as is expected at that moment in the talk exchange) set the ground for an essentially benevolent view of human communication, in which utterances are geared towards working for the joint completion of the communicative event in which participants are involved. While other models of pragmatics have offered different explanations as to what might constitute the driving force(s) behind this initial cooperative, benevolent impetus, all of them have retained at one level or another the view that human communication is a cooperative endeavour towards a common goal.

In Relevance Theory for instance (Sperber & Wilson, 1995; Wilson & Sperber, 2012; Blakemore, 2002; Carston, 2002; Clark, 2013), this same insight is captured in the second principle of relevance: the communicative principle of relevance, which could be defined in the following way (see Clark, 2013 for a good introduction to the relevance-theoretic model):

> Communicative Principle of Relevance:
> Every ostensive stimulus conveys a presumption of its own optimal relevance.

This captures the same idea that there is an expectation bearing on speakers that they would work towards providing an optimal input through their utterance.

For Grice, cooperation – and the four maxims attached to the Cooperative Principle – follows from a general human drive towards rational behaviour (yet relatively vaguely defined). In Relevance theory, on the other hand, optimality is a function of an input to the cognitive environment (henceforth CE) of an individual: the hearer's, in prototypical communicative interactions.

Specifically, an input's relevance is measured in terms of its ability to induce changes in the hearer's cognitive environment – i.e. the sum of the assumptions that are available to the hearer at a given point in time.[1] In that sense, benevolence can be thought of as an effort towards maximising the hearer's cognitive benefit in processing the

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[1] Following the practice in relevance-theoretic literature, we construct examples in which the speaker is female, and the hearer is male.

utterance. This notion of cognitive relevance has thus been captured by two cognitive principles which govern utterance interpretation processes:

> Relevance of an input to an individual:
> a. Other things being equal, the greater the positive cognitive effects achieved by processing an input, the greater the relevance of the input to the individual at that time.
> b. Other things being equal, the greater the processing effort expended, the lower the relevance of the input to the individual at that time. (Clark, 2013, p. 106)

One of the striking aspects of this approach lies in the fact that interpretation is seen as a process in which the cognitive system follows a path of least effort, combining assumptions conveyed by the input utterance with previously held assumptions available in CE in order to infer new assumptions, maximising the resulting modifications in CE.

In that respect, utterance interpretation is seen as the result of a selection procedure that identifies a set of relevant assumptions which are taken to represent the communicative intention of the speaker when she used the utterance in question in the given interactive situation. The set of assumptions thus constructed stands for the cognitive representation of the context associated with the utterance. That is to say that within Relevance Theory, interpretation relies on a procedure of context selection, where selection is driven towards maximising the cognitive gain and minimising the expenditure of cognitive resources.

In a series of papers, we have argued that a fruitful way of understanding how deceptive discourse works, and in particular of looking at the way people can be manipulated by it, consists in focusing on how it affects the very interpretative process described above (Maillat & Oswald, 2009, 2011, 2013; Maillat, 2013, 2014; Oswald, 2010, 2014). Coming back to the idea of benevolence discussed earlier, while it can be applied in a majority of everyday instances of conversational interactions, it should be clear that in a number of instances the speaker's attitude towards the hearer when communicating with him would best be described as NOT benevolent, or even malevolent. Whereas Grice (1989) does not talk much about such instances, non-benevolent communication has been a preoccupation in Relevance Theory right from the outset. For example, Sperber (1994) referred to standard interpretative procedures as being based on a form of "naive optimism". As it turns out, RT has insisted on the fact that the relevance-based heuristics they propose are susceptible to yield erroneous

interpretations, i.e. interpretations that misrepresent the speaker's original communicative intention. In other words, the relevance-driven optimisation procedure may at times miss its target. This is due in great part to the fact that relevance of an input can never be evaluated from an absolute perspective (against all possible sets of contextual assumptions), but in the relative perspective of the selected sub-set of contextual assumptions).

Unsurprisingly, therefore, humans evolved a form of communicative strategy that takes advantage of the limitations of the interpretative system of their interlocutor to deceptively convince them of something. In this sense, manipulation exploits some inherent flaws of the interpretative process in order to induce sub-optimal – from the hearer's perspective – changes in the hearer's cognitive environment. In that respect, the strategy discussed here is similar to the strategy deployed by a computer virus that seeks to enter the system by targeting a technical flaw of that system.

In this context, the flaw targeted in the system is the context selection procedure we described previously. As we saw then, context selection follows a path of least effort to reach the first relevant interpretation of an utterance it can arrive at by combining old, new and inferred assumptions. A deceptive communicator who wants to convince a hearer of U will deliberately try to force context selection down a path – to impose the selection path – in such a way that it ensures the uptake of U in the hearer's cognitive environment.

Thus, whereas a benevolent speaker will try to achieve this goal by selecting an utterance U that is optimally relevant in her own representation of the hearer's cognitive environment, a deceptive – and hence malevolent – speaker will try to induce the same change in the hearer's CE by changing the degree of salience and accessibility of certain assumptions in his CE, thereby ensuring that context selection for U is processed within a constrained sub-section of the hearer's CE. This deceptive manipulative strategy we call Context Selection Constraint and it is defined as follows.

> Context Selection Constraint:
> CSC is a twofold process by which a constraint that limits context selection is combined with a target utterance U in order to force the interpretation of the latter within a limited set of contextual assumptions and to effectively ensure that the interpretation is reached before a known, alternative (contradictory) subset of assumptions is accessed.

On the basis of the two sub-principles of relevance defined above, we predict that there will be two ways to lure context selection towards a sub-optimal set of contextual assumptions. You can either increase the expected cognitive yield of the target utterance in the sub-optimal set of contextual assumptions (in terms of positive cognitive effects); or you can increase the accessibility of the sub-optimal set of contextual assumptions (thereby reducing the cognitive effort required to process the target utterance in that context).

To the extent that such CSC strategies are designed to affect the inferential path followed during the interpretative process, they can be said to convey procedural information in the interpretation of the on-going exchange. Procedural here is intended in the sense defined by Blakemore (2002, p. 89) when she refers to expressions which constitute "means for constraining the inferential tasks involved in utterance interpretation".

In the following sections, we will take the research agenda of CSC one step further by investigating its explanatory power within simple argumentative structures, in which a constraining CSC strategy is used to reinforce a premise in order to convince a hearer of a given conclusion. Having established the theoretical predictions we make based on CSC, we will discuss some on-going experimental evaluations of the model in sections 4 and 5.

3. CSC AND ARGUMENTATION

While the CSC model described in the previous section was originally designed to account for deceptive communication, it can be extended in order to account for some aspects of argumentative communication, notably on the cognitive processing side. The CSC has in the past years indeed been used to offer pragmatic and cognitive insights on a range of argumentative phenomena, among which mostly argumentative moves traditionally defined as fallacies. As part of an effort to demonstrate the usefulness of the model for the analysis of argumentation, this research has tackled, both from a theoretical and an empirical perspective, source-related fallacies such as the *ad verecundiam*, the *ad hominem*, and the *ad populum* – which is experimentally investigated in this paper – in the works of Maillat & Oswald (2009, 2011), Oswald (2010, 2014), Maillat (2013, 2014) and Oswald & Hart (2013), the straw man fallacy (Oswald & Lewiński, 2014; Lewiński & Oswald, 2013), but also extended metaphors and their argumentative potential (Oswald & Rihs, 2013). In what follows we provide the rationale for the incorporation of the CSC model into a genuinely argumentative investigation.

Fundamental developments of argumentation theory have traditionally concerned two core issues related to the practice argumentation. The first has to do with finding ways to distinguish "good" from "bad" argumentation and has therefore concentrated on the identification of reliable normative criteria for argumentative evaluation.[2] The research field originates in Aristotle's development of logic (see Smith, 1995, p. 27), and has been expanded over time by, among others, epistemological, dialectical and informal approaches. These, in turn, include normative (or normative-like) standards, among which functional criteria enforcing the promotion of justified true belief (see e.g. Siegel & Biro, 1997; Goldman, 2003), dialectical rules of critical discussion (see e.g., van Eemeren & Grootendorst, 2004), argumentation schemes and critical questions (see e.g. Walton *et al,.* 2008), and the criteria of relevance, sufficiency and acceptability offered by informal logicians (see e.g., Blair, 2007; Johnson & Blair, 2006; Johnson, 2000).[3]

The second fundamental area of research in argumentation studies is closer to rhetorical concerns and has to do with the effectiveness of argumentation as an instrument of persuasion. Like those of logic, the roots of rhetoric can be found in Aristotle's work; over time, however, rhetoric failed to develop like her sister disciplines, logic and dialectics, and it is only in the middle of the 20th century that rhetoric started to reclaim scholarly attention, notably through the works of Toulmin (1958) and Perelman & Olbrechts-Tyteca (1958). Contemporary research in rhetoric strives to identify the reasons behind the success of argumentative moves, in terms of their convincingness (see Roque, 2012 for an up-to-date collection of works around the status of persuasion research in argumentation theory), and is nowadays leaning towards interdisciplinarity by recruiting the input of psychological and cognitive science (Herman & Oswald, 2014). To a fair extent, understanding why arguments (be they fallacious or not) might be rhetorically effective and appealing is a psychological question, as they are verbal messages meant to influence people's mental states (thoughts, beliefs, attitudes, etc.). This assumption underlies recent work in cognitive psychology inspired by a Bayesian probabilistic framework which develops a model of inference allowing to predict what kind of arguments people are likely to find strong and weak (see

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[2] Since we are not addressing evaluative issues in this paper, we deliberately remain vague by mentioning "good" and "bad" arguments so as to avoid a discussion on the relative merits of notions such as validity, soundness, acceptability, etc.

[3] See Zenker (2013) for a thorough review and discussion of these normative criteria.

Hahn & Oaksford, 2006, 2007; Hahn et al., 2012). We claim in what follows that the CSC model can take part in the ongoing effort to bridge the gap between cognitive science and argumentation studies by contributing to shed light on the cognitive underpinnings of argument processing.

Our interest in argumentation theory is psychologically motivated: what happens, on the processing side, when people process arguments and find them convincing? Answering this question requires a focus on the cognitive machinery involved in argument processing; in this paper we will particularly be focusing on what argumentation scholarship has identified as fallacies. The standard treatment of fallacies – identified as such by Hamblin (1970) – considers a fallacious argument to be "one that seems to be valid but is not so" (Hamblin, 1970, p. 12), or, as summarised by Johnson (1987, p. 241), "reasoning which appears to be good but is not". Beyond its obvious shortcomings (see Hamblin, 1970; Johnson, 1987), this definition nevertheless does capture an intuition we can exploit by interpreting it in light of the CSC. The standard claim takes fallacies to be effective (i.e. convincing or persuasive) because they seem valid, or good, which is to say that they resemble good arguments. This last feature can be further discussed by (i) considering a fallacy's propensity to obscure the fact that it manifests a faulty inference and (ii) considering that this propensity plays a role in its success. That is, we hypothesise that fallacies are effective at least partly because we do not notice that they are fallacies. From this informal characterisation emerges the idea that it seems crucial to their persuasive success that they manage to conceal their fallacious nature. The consequence of this, in processing terms, is that successful fallacies manage to keep their addressees from processing specific critical information sets – those the awareness of which would alert the addressee to the fishiness of the argument, such as information about speaker intention, about the inconsistency of the argument, about a discrepancy between its content and the addressee's beliefs and values, etc. For this very reason, fallacies seem to trigger the very processing CSCs trigger: they operate a twofold constraint on the addressee's processing of information, so that chances of representing critical information are weakened and chances of representing "fallacy-friendly" information are increased.

From a discursive perspective, fallacies are verbal manifestation of inferential – specifically argumentative – articulations between pieces of information that are directed at an audience. They are couched in language and as such need to be interpreted before any argumentative processing can take place. Before one can evaluate whether a conclusion follows from a set of premises – even if this is the result of intuitive

rather than reflective inference –, one needs to understand their content. This *ipso facto* makes cognitive argumentative processing operate on an input representation that is actually the output of the comprehension process. In other words, what you understand may play a role in what you end up accepting or rejecting after you evaluate a given argument. Assuming that the CSC operates at the level of information selection during the comprehension process, we can therefore assume that argumentative evaluation will be affected by the CSC.

Our claim is thus a claim of processing similarity: what happens in people's minds when they are being duped by a deceptive message is similar to what happens in their minds when they fall for a fallacious argument.[4] We therefore submit – and try to experimentally investigate – that fallacies can be described as devices which induce cognitive constraints on the selection of information which unfold along the two dimensions related to Sperber & Wilson's extent conditions of relevance, namely processing effort and cognitive effect (1995, p. 125, but see also the definition of relevance to an individual given above in section 2). Building on our previous work, we therefore claim that some fallacies will act as devices meant to increase the accessibility and the epistemic strength of information, while others will decrease the accessibility and epistemic strength of antagonistic information. More precisely, we will consider that the fundamental property of fallacious verbal material is its ability to constrain the interpretation of the message in order to prevent a context set C' containing critical information from being considered for the subsequent evaluative stage of processing, most of the times by simultaneously foregrounding a context C which is sufficient to establish interpretative relevance.

To illustrate how known fallacies can be interpreted in this framework, let us take the pair of fallacies known as *ad verecundiam* and *ad hominem*. The first is traditionally assumed to rely on irrelevant expertise (see e.g. Walton, 1995) and the second brings to the fore some personal characteristic of its target in order to undermine their credibility (*ibid.*). Crucially, both fallacies work along the same dimension, but in opposite directions: the *ad verecundiam* emphasises the assumed credibility/reliability/trustworthiness of the source so that the epistemic strength of the source's arguments or claims is increased (you are more likely to believe what your doctor says than what a known pathological liar tells you), and the *ad hominem* does the exact

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[4] Note that whether the fallacy has deliberately been produced by the speaker is of little importance here, as we are taking the perspective of the addressee. For a discussion see Oswald (2014).

opposite by undermining the credibility/reliability/trustworthiness of the source so that the epistemic strength of the source's arguments or claims is decreased (again, you are less likely to believe what a known pathological liar says than what your doctor tells you). So the propositions conveyed by sources will be differently regarded – and their cognitive status in terms of reliable information will vary accordingly – depending on whether the source is assumed to be trustworthy or not. From the cognitive perspective adopted here, *ad verecundiam* and *ad hominem* are thus interpreted as fallacies which attempt to constrain the message in a way that the epistemic strength of information that will be used for their evaluation by the addressee can be manipulated, thereby influencing the inclusion or exclusion of respectively (perceived as) reliable and (perceived as) unreliable information in the context sets of information which will be used for argumentative evaluation.

We assume that the *ad populum fallacy*, usually defined as the use of the majority view or of a generally accepted statement as definite evidence for a conclusion (see Walton, 2006), works similarly to the *ad verecundiam*, only that instead of relying on the likely epistemic strength we associate with what authorities tell us, it relies on the likely epistemic strength we tend to attribute to widespread beliefs. The next section describes how this effect might be tested in light of the theoretical model introduced here and introduces an experiment meant to test whether *ad populum* arguments do have some appeal.

4. TESTING THE INFLUENCE OF THE AD POPULUM AS A CSC

The effects of repetition on human cognition have already been discussed and studied to some extent (Zajonc, 1969; Hasher & Chormiak, 1977; Cacioppo & Petty, 1979; Bacon, 1979; Arkes et al., 1990; Boehm, 1994; Ozubko & Fugelsang, 2011). It has been shown that repetition of an item or stimulus affects the subjective ratings of both its validity (i.e., the extent to which it is perceived to be true) and its "likeability" (the associated positive affective state). In the literature the two corresponding effects have been termed the validity effect (Boehm 1994), which denotes the increase in perceived validity, and the mere exposure effect (Zajonc, 1969), which denotes an increase in positive affect.

The differences between both of these effects tend to be attributed to the cognitive mechanisms behind them. Zajonc (1969), in discussing the mere exposure effect, argues for an explanation using frequency discrimination, which according to Hasher & Chormiak (1977) is an innate mechanism. At the same time various authors

advocate a familiarity-based approach to repetition (Bacon, 1979; Arkes et al., 1990; Boehm, 1994). On their account, the main variable at play in the validity effect is familiarity with information, which can be enhanced through various means, e.g., repetition, source disassociation, reputation of the source, familiarity with the topic, etc. Arkes et al. (1990) provide a complex interaction schema between validity, source disassociation (the idea that the message comes from various different sources) and repetition, arguing that familiarity tends to enhance the validity effect in all cases.

In connection with issues raised in argumentation theory, Ozubko & Fugelsang (2011) have shown that repetition and familiarity not only affect the perceived validity of the repeated item, but that their effects carry over to an inferred assumption. By repeating an item that serves as a premise for a conclusion in an inferential process (e.g., an evidence statement such as "Roses need 20 minutes of sunlight per day to grow properly" and an inferred statement: "Roses can grow even with very little sunlight" Ozubko & Fugelsang, 2011, p. 276) the subjective validity of the conclusion is increased. Further, in what authors call "the memory retrieval condition" – where participants are presented during the evaluation phase with only the conclusion (inferred statement) – the effects are more robust than in the "classical condition" – where both the premise and the conclusion (evidence statement + inferred statement) are jointly presented during the evaluation stage.

We believe that this type of design can lend empirical support for the Context Selection Constraint Model in an argumentative sequence, as was discussed in the previous sections, specifically since Ozubko and Fugelsang have shown that the validity effect persists in an argumentative structure. If repetition and familiarity with information do increase validity ratings towards the repeated and/or familiar statement, this can be exploited in argumentative communication by constraining context selection in order to make targeted assumptions more salient via repetition or induced familiarity. While actual repetition is quite obvious (its use in advertisements could be a prime example), induced familiarity can be achieved in more subtle ways, for example with statements such as "everyone believes X" or "X is accepted by everyone." These instances seem to relate quite straightforwardly to what the literature on argumentation calls the *ad populum* fallacy, defined in the previous section. Now, if familiarity with a given piece of information is sufficient to trigger the validity effect, referring to statements as known by everyone or a majority should make them more salient by assigning familiarity to them within the community. In effect this would then correspond to a CSC strategy that can be exploited to

reinforce a claim or conclusion supported by the familiar statement. The next sub-section discusses an on-going experimental study to test these claims.

4.1 Experiment

The current experiment is an attempt to see if the validity effect, triggered by familiarity, can be tested in an argumentative setting. As mentioned before, Ozubko and Fugelsang's results (2011) show that the validity effect can carry over to an inferred assumption or, in argumentative terms, from premise to a claim, which suggests that our assumption has some prospects of being empirically valid. If this is the case, then, based on the claims provided in the CSC model, we would assume that repetition of information would work as a CSC making a premise statement more salient and thus easily accessible in a person's cognitive environment. This in turn should result in a valid strategy for increasing the persuasive strength of the message. Additionally, since the validity effect is mediated by familiarity and not only by direct repetition, we claim that just referring to repetition or to the fact that the present statement is in everyone's cognitive environment (e.g. "everyone knows that X") should tap into similar processing mechanisms and result in an increased validity judgment for an argument.

　　　In order to test these claims we have set up an experiment that manipulates two variables, namely repetition of information and accessibility of information (memory retrieval in Ozubko & Fugelsang, 2011). Repetition of information is manipulated by providing participants with scenarios that have either no repetition of the critical statement, repetition of the critical statement and critical statement in the form of *ad populum*. Accessibility of information is manipulated by providing participants with two types of statements concerning the scenarios of the form: Premise + Claim or Claim. The design is summarised in table 1 below.

Stimuli	Critical Task	Filler task
Scenario consisting of a narrative of approximately 130 words **Conditions** *(Variable: familiarity of a target statement U in the scenario):* *1.* U uttered once (frequency 1) 2. U is uttered multiple times (frequency 3) 3. U mentioned as being uttered by everyone (frequency 1)	*Assess the degree of agreement with a claim supported by the repeated statement* **Conditions** 1. Premise + Claim 2. Claim	*Assess the degree of agreement with other claims in connection with the scenario*

Table 1 – Experimental design

Based on the previous studies and the theoretical model of the CSC we make two predictions. Firstly, we predict that repetition of critical statements and mention of critical statements in *Ad Populum* form will trigger the validity effect for that statement. Secondly, we argue that the validity effect for critical statements will be increased in cases where only the claim is presented, since memory retrieval is predicted to increase familiarity with the information accessed.

4.2 Participants

Participants in the experiment were 60 individuals from the United States whom we contacted via the Amazon's Mechanical Turk service. The experiment was set as a within participant design in which each individual participated in each of the 6 conditions. As a result 60 participants responded in each condition.

4.3 Material

The experimental material consisted of 18 unique scenarios, 130-words long on average that were pretested on native English speakers for language and argumentative acceptability. We used both scenarios previously used in Evans' (1983) investigation in syllogistic reasoning, together with other scenarios we created ourselves from news bulletins. Each of the 18 scenarios were made to vary on a familiarity scale ranging from no repetition (i.e. one occurrence), to three occurrences, to mention of familiarity via an *ad populum* (see Table 1). For each of the scenarios two critical questions were created (one for the Premise + Claim condition and one for the Claim condition). The Premise + Claim condition consisted of the critical statement found in the scenario

previously mentioned and a claim it supported; while in the Claim condition only the claim was mentioned. This second parameter, i.e., the contrast between Claim vs. Premise + claim conditions, echoed the design used by Ozubko and Fugelsang (2011). Finally, each scenario featured two filler questions that, while thematically related to the scenario, ensured that participants would not realise what the purpose of the task was.

4.4 Procedure

Participants completed the experiment in the form of a survey on the Qualtrics survey builder platform. Each participant received all of the 18 scenarios but with various permutations. In general each participant saw 6 items with the No Repetition condition (for 3 of those scenarios, statements with the Premise + Claim condition were presented and for the other 3 scenarios, statements with the Claim condition were presented) together with 6 items for the Repetition condition (the same variation in questions) and 6 items with the Familiarity condition (again, the same variation for question holds). To guarantee this setup, a Latin square design with 6 groups with 18 items in each was constructed. This helped to ensure that each item got represented with all the various permutations – "Repetition", "No Repetition", "Ad Populum" and "Premise + Claim", "Claim." Participants were randomly assigned to one of the 6 groups and the 18 items were randomised.

When accessing the Qualtrics survey the participants were instructed to read each of the scenarios presented and afterwards to rate three statements (1 critical + 2 fillers) based on the scenario presented. Once the scenario had been read and after the participant pressed the "Continue" button, there was no way of returning to the previously read scenario, so the evaluation task was conducted on their recollection of the scenario. At any given moment participants only saw either the scenario or one of the 3 statements related to it. Each of the statements was presented with a 7 point Likert scale from "Strongly disagree" to "Strongly agree" in order to ensure the comparability to previous studies using the same scale.

4.5 Results and discussion

The experiment was designed to yield insights on two measures of interest: (i) whether the validity ratings given by the participants for the statements are affected in the Repetition and Ad Populum conditions and (ii) whether memory retrieval (Ozubko & Fugelsang, 2011) has a noteworthy effect on validity judgments (i.e., whether the Claim

condition exhibits higher validity effects than the Premise + Claim condition). The results obtained during the experiment are shown in table 2 and are further illustrated in Figures 1 and 2.

	No repetition		Repetition		Ad Populum	
	Premise + Claim	*Claim*	*Premise + Claim*	*Claim*	*Premise + Claim*	*Claim*
M	5.01	5.13	5.22	5.07	5.19	5.28
SD	1.76	1.63	1.57	1.64	1.61	1.39
MSE	0.44	0.41	0.40	0.41	0.40	0.35

Table 2 – Means (M), standard deviation (SD) and mean standard errors (MSE) across all conditions
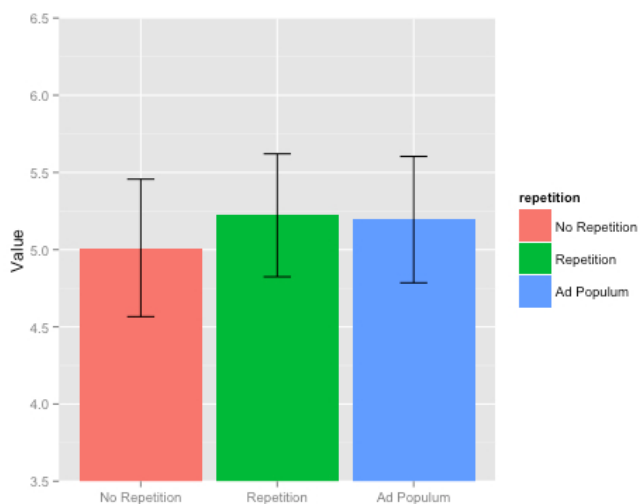

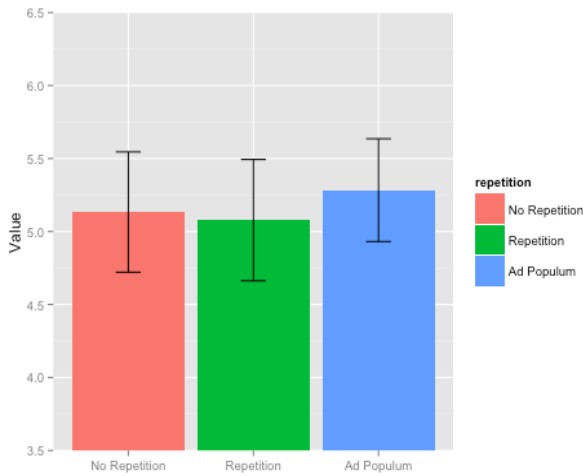Figure 1 – Means across condition Claim + Premise

Figure 2 – Means across condition Claim

For the Repetition and Ad Populum conditions, the expected effect was observed for all the conditions, except for the Repetition with Claim discussed below. In general for the Premise + Claim conditions a similar effect to the one observed in the literature on repetition studies (usually 0.30 scale points) was observed (Gigerenzer, 1984). Crucially, the effect of familiarity is replicated in the Ad populum condition. Thus, participants rated the claims in the conditions with Repetition and Ad Populum as more valid than in the control condition (effect size 0.21 for Repetition and 0.18 for Ad Populum, $F(2, 537) = 0.868$, p=0.4. For the Claim condition a reversed effect was observed for Repetition (effect size -0.06) and an effect on the Familiarity condition (effect size 0.15, $F(2, 537) = 0.838$, p =0.4). Statistical significance at a .05 level was not achieved for the above-mentioned cases. Statistical significance was also not achieved for their combined effects ($F(2, 1074) =0.737$, p = 0.5).

Since the effects found here did not reach statistical significance, they should be discussed with caution because the null hypothesis, that there are no differences in the means between our groups cannot be rejected. With that in mind, the familiarity effect seems to be persistent in a similar fashion as discussed in the literature with effect sizes close to those observed (Gigerenzer, 1984). Interestingly, there seems to be very little difference between the Ad Populum condition (induced by mention of repetition) and actual Repetition (0.03), which lends support to the claim that *ad populum* arguments are effective. It seems that the familiarity effect is persistent at the same level in both cases. The question remains if in both cases the same mechanisms are at play, or if we are looking at different mechanisms that just produce similar

results. Again, this is consistent with the literature as it highlights the complex relationship between validity, repetition and familiarity (see Bacon, 1979; Arkes et al., 1990; Boehm, 1994). Overall, the Ad Populum, in both Premise + Claim and Claim conditions, exhibited the highest validity ratings of all conditions. It seems that the effect induced by memory retrieval noted by Ozubko & Fugelsang (2011) is best replicated in the *ad populum* condition which can be taken as an indication of the inferential work required to reconstruct both the representation and the mentioned familiarity of the target statement. As a result, the *ad populum* argument paired with an implicit reconstruction of the premise seems to be the most efficient way of triggering the familiarity effect.

Since significance was not achieved in the present experiment, and we can only report a confirmation of the predicted trend, in particular in the Premise + Claim condition, the next steps would be to create a follow-up study, for instance by increasing the number of participants or items, in order to improve statistical power for an effect which is obviously rather small[5].

5. CONCLUSION

In this paper, we have shown how the *ad populum* fallacy can be accounted for within the Context Selection Constraint framework. We have argued that a pragmatic account, based on CSC, of the kind of effect triggered on the hearer by an *ad populum* fallacious argument can be explained in terms of the assumption of familiarity it assigns to the argument: the assumption of familiarity constrains the way we interpret the conclusion supported by that argument.

In doing so we have argued that an *ad populum* conveys procedural information regarding the kind of inferential assumptions that can be derived from the argument embedded in the *ad populum*. Specifically, the *ad populum* licenses an inference on the familiarity of the embedded argument, which results in a greater cognitive effect for the argument. Interestingly, from an argumentative point of view, the trends observed in the experimental results appear to support a model in which the cognitive strength of a premise is reflected in the cognitive strength of an inferred conclusion.

Nevertheless, the on-going experimental evaluation of our predictions has had mixed results. While on the one hand our first set of

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[5] Additionally employing mixed models for our statistical analysis gives us a better fit of the model and a better analysis of our data indicating a potential for future studies of a similar type.

results appear to confirm the impact of familiarity on the perceived strength of a premise, as well as to confirm the transitivity of familiarity from a premise to the conclusion it supports in an argumentative structure, these trends, although they echo the effect size noted in previous studies, fail to reach statistical significance.

At this stage a number of hypotheses can be entertained to explain these mixed results. Our current best bet is that we need to improve the statistical power of our data by increasing the number of subjects taking the test, or by increasing the number of items. This is the direction currently pursued for our next investigation.

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