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A Study of Epistemic Modality in Academic and Popularised Discourse: The Case of Possibility Adverbs *Perhaps*, *Maybe* and *Possibly**

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ABSTRACT

This paper describes the use of *perhaps*, *maybe* and *possibly* in a cross-disciplinary corpus of academic and popularised scientific writing. It accounts for their higher frequency in popularised discourse by investigating their functions in detail. The analysis, conducted from various perspectives (syntactic, semantic, pragmatic and rhetorical), suggests that two factors are at work: the evidential basis for the epistemic assessment and the mode of discourse the marker is most closely associated with. The fact that *perhaps* and *maybe* express unsupported conjectures within explicative passages explains why they are less frequent in academic contexts where excessive recourse to ungrounded assumptions and to the explicative mode –which implies a knowledge asymmetry– would be harshly received. As for *possibly*, we show that its distribution depends on its interpretation. In its root meaning, it is equally fit for popularised and academic discourses. In its epistemic use, however, it is less frequent in research articles,

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like epistemic modals and other epistemic adverbs. Because it indicates that the epistemic assessment is based on the writer's recognised expertise, its use is preferred in the most factual and uncontroversial modes of discourse, namely, narration and information, which are more typical of popularisation.

Keywords: perhaps, maybe, possibly, adverbs, epistemic modality, hedging, popularisation.

Introduction

This paper describes the use of the three possibility adverbs *perhaps*, *maybe* and *possibly* in a cross-disciplinary corpus of academic and popularised scientific writing. It contributes to an on-going research project on variations in the expression of epistemic modality according to intended audience. It also seeks to characterise a set of modal expressions that have received scarce scholarly attention.

Following Høye (1997), Nuyts (2001), White (2003) (among others), we regard modality as a semantic and pragmatic category, so that modal expressions should be studied in their contexts of occurrence and not exclusively at the level of single utterances. Our aim is therefore to provide a fine-grained analysis of three linguistic forms that takes into account their communicative context. To shed further light on the functions of these adverbs, their use will be contrasted with that of the modal *may*.

The outline of this paper is as follows. We first review previous works on *perhaps*, *maybe* and *possibly* and their use in scientific writing. We then present the methodology we have used. In the results section, we give a general overview of the use of epistemics in our specialised and popularised corpora before turning to the three adverbs under scrutiny. In the discussion, we try to account for the differences between the two text-types by examining the functions of these forms in their contexts of use.

1. State of the art

1.1. *Perhaps, maybe and possibly*

The use of modal adverbs, and of possibility adverbs in particular, has been addressed only marginally in the literature on modals or modality (cf. Perkins 1983, Palmer 1990, Nuyts 2001, Radden and Dirven 2007, among others) and on adverbs (cf. Greenbaum 1969, Biber et al. 1999, Huddleston and Pullum 2002, etc.). The two notable exceptions are Hoye (1997) who, however, focuses on modal/adverb collocations and not on adverbs *per se*, and Tucker (2001) who offers an in-depth analysis of *possibly* and a few but insightful comments on *perhaps* and *maybe*.

The three adverbs under scrutiny fall into one sub-class of attitudinal adverbs (cf. Greenbaum 1969), namely, that of epistemic adverbs, which express uncertainty about the reality of the proposition. They are often grouped together owing to the low degree of probability they denote.

The syntactic properties of attitudinal adverbs have been well-known since Greenbaum (1969): they are uncomfortable with questions, highly mobile, and difficult to modify. These syntactic properties are often assumed (cf. Perkins 1983, Nuyts 2001, Radden and Dirven 2007) to reflect their semantics, which we now examine.

1.1.1. *Modal meaning*

Most authors agree that modality is subdivided into root and epistemic modalities. Modal adverbs are mainly epistemic, which explains why, like epistemic modals (cf. Palmer 1990, p. 62), they are rare in questions.

Yet, Tucker (2001) suggests that while *perhaps/maybe* are exclusively epistemic, *possibly* conveys primarily root –and more precisely, circumstantial (cf. Huddleston & Pullum 2002, p. 184-185)– possibility. Its epistemic reading is only a secondary sense inferable in certain contexts.

This suggests that *perhaps* and *maybe* belong to the neustic component of the sentence (cf. Hare 1970 and Lyons 1977), that is, to the part of the sentence that carries meanings related to the illocutionary force or speaker attitude towards the proposition. They therefore express an epistemic assessment over the whole

sentence. In contrast, *possibly* primarily pertains to the phrastic (*ibid.*) component of the sentence, which explains why it can function as an intensifier before *can* and *could* while *perhaps* and *maybe* are always sentence adverbs. Its phrastic status also explains why, unlike neustic *perhaps* and *maybe*, it can have scope over constituents below the clause and modify adjectives within NPs, as in (1).

(1) *a possibly/*perhaps/*maybe difficult decision* (Taken from Tucker 2001, p. 188)

1.1.2. Objective vs subjective modality

Following Nuyts (2006), we consider an evaluation subjective “if the issuer presents it as being strictly his/her own responsibility” (p. 14). The modal assessment expressed by modal adverbs is often assumed to be objective, or at least, less subjective than if expressed by a modal (cf. Nuyts 2001, Ressano 2004). However, there are some differences among the class of adverbs.

Perkins (1983) thus argues that *perhaps* and *maybe* are “neutral with regard to the subjective/objective opposition” –on the grounds that they are more comfortable with questions– while *probably*, being morphologically derived from a modal adjective, “retain[s] a strong element of objectivity” (p. 90).

For the same reason, Perkins (*ibid.*) views *possibly* as more objective than *perhaps/maybe* – see also Tucker (2001) who speaks of “implied objectivity” (p. 198). However, Greenbaum (1969, p. 111) has shown that *possibly* is more acceptable in questions than *probably*, which indicates that *possibly* lies somewhere between *perhaps/maybe* and *probably* on the subjective/objective axis. This is consistent with the analysis of *possibly* as a phrastic operator. A sentence expressing circumstantial possibility is an assertion that the state of affairs is (objectively) possible and not a (subjective) assessment of its likelihood.

1.1.3. Information focus

Modal adverbs have non-focal status (cf. Greenbaum 1969 and Nuyts 2001). That is why most modal adverbs cannot be modified –*possibly* is an exception (cf. Perkins 1983)– since modification gives informational salience to the evaluation

(cf. Nuyts 2001). Yet, although epistemic adverbs defy focalisation, they “help to focus the major information point in the clause” (Greenbaum 1969, p. 194). For example, in (2), *perhaps* qualifies the superlative but also focalises it.

(2) ...and received *perhaps* his most rousing ovation. (Borrowed from Greenbaum, *ibid.*)

Thanks to their distributional mobility, these adverbs can therefore focalise a wider range of elements than modals and epistemic adjectives. This is especially true of *possibly* which, unlike *perhaps/maybe*, can modify and thus focalise adjectives (cf. (1)).

1.1.4. Evidentiality

Evidentiality is the semantic category “which relates to the source of evidence the speaker has for his or her assessment” (de Haan 2009, p. 263). “[T]here is a logical relation between [evidentiality and epistemicity] in the sense that epistemic judgements are conceptually based on evidence” (Nuyts 2006, p. 11). Therefore, it is common for an epistemic expression to convey an evidential meaning by suggesting “that there is evidence for the statement the speaker is making” (de Haan 2009, p. 268), even if the evidential basis is not explicit. For Nuyts (2001), epistemic adverbs have no evidential meaning, unlike modals, which display a slight tendency toward this feature.

This is in line with Tucker’s (2001, p. 197) observation that, with *perhaps* and *maybe*, the speaker makes some “wild speculation” about the reality of the state of affairs, whereas *possibly* evokes a possibility that relies on the speaker’s expertise. Indeed, we have seen that sentences expressing circumstantial modality are assertions, which, on the basis of Grice’s (1975) maxim of quality, implicate a “default epistemic stance” (Furmaniak 2011, p. 59), namely, *I know that (there exists a possibility that p)*.

1.1.5. *Perhaps* vs *maybe*

To our knowledge, the difference between *perhaps* and *maybe* has never been investigated thoroughly. For Greenbaum (1969), *perhaps* is used indifferently in

spoken and written discourse while *maybe* is “highly colloquial” (p. 194). This is confirmed by Tottie (2002) who has observed that, in British English, *maybe* is 3.8 times as frequent in speech as in writing¹.

1.2. Epistemic adverbs in scientific writing

1.2.1. Epistemic adverbs and hedging

Discourse-oriented studies of epistemic markers have focused on hedging, of which epistemics are the most common realisation (cf. Crompton 1997 and Hyland 1998). Fraser (2010) remarks that, despite many existing classifications, there is “general agreement today that HEDGING is a rhetorical strategy, by which a speaker, using a linguistic device, can signal a lack of commitment to either the full semantic membership of an expression (PROPOSITIONAL HEDGING) [...] or the full commitment to the force of the speech act being conveyed (SPEECH ACT HEDGING)” (p. 22).

While epistemic markers, and therefore epistemic adverbs, are more closely associated with propositional hedging, as in (3), Fraser (*ibid.*) notes that *perhaps* can be employed to soften a suggestion, as in (4), and thus be used as a speech act hedge.

(3) *Third, one could retard the apparent maturation of amyloid beta-protein deposits into neuritic plaques, perhaps by interfering with the formation of the amyloid (...).* (Borrowed from Varttala 2001, p. 211)

(4) *Perhaps you would sit down a minute.* (Cited by Fraser 2010, p. 22)

The category of hedging therefore includes –but is more extended than– that of modality, since it incorporates resources that are not epistemic (e.g. rounders). Yet, studies of hedging are relevant to the study of modality because

1 Tottie notes a difference in the distribution of *perhaps* and *maybe* in British and American English. These dialectal variations are however beyond the scope of this paper.

they draw attention to the pragmatic factors motivating their use and therefore, to the interpersonal component of epistemic modality –which is often overlooked in more sentence-centred approaches.

According to Salager-Meyer (1994), hedges –and therefore, epistemics– are employed for two main reasons: either to “present the true state of the writers’ understanding, namely, the strongest claim a careful researcher can make” (p. 150), that is, to express genuine uncertainty, or, as in (5), to “convey (purposive) vagueness and tentativeness, and to make sentences more acceptable to the hearer/reader, thus increasing their chance of ratification and reducing the risk of negation” (*ibid.*).

- (5) *This is **perhaps** explained by the fact that these tests were the first 2 prototypes for which population-based screening of newborns was instituted (...).* (Taken from Vihla 1999, p. 91)

1.2.2. Epistemic adverbs in academic and popularised scientific writing

The counterpart of the vast scholarly interest in hedging has been that, except for modal auxiliaries, epistemic expressions –including adverbs– have not been studied for themselves but as part of wider groupings of forms from the same grammatical categories and/or accomplishing comparable functions. Consequently, there exists no detailed study of individual adverbs in specific text-types and, apart from a few remarks on the frequencies of *perhaps*, *maybe* and *possibly* in certain genres, the literature tells us little about their functions and how they differ from one another.

1.2.2.1. Epistemic adverbs in research articles (henceforward RAs)

Much of the research on the linguistic properties of scientific discourse has been conducted on RAs and there is general agreement that RAs make extensive use of hedges and, in particular, of epistemic markers (see Varttala 2001).

However, if attitudinal adverbs have been found to be among the most common expressions of hedging across disciplines (cf. Hyland 1998, Varttala

2001), Vihla's (1999, 2000) studies of possibility markers in medical writing and Varttala's (2001) exploration of hedging in three disciplines have demonstrated that possibility adverbs are rare compared to *may/might* (Vihla 2000) and that their respective frequencies are similar in medical writing and in 'ordinary' language (Vihla 1999, p.74)². Yet, the functions of these adverbs are not examined in detail and though Varttala (2001) has found only "minor disciplinary differences [...] in the frequency of hedging with the help of probability adverbs" (p. 129), he offers no detailed analysis of individual adverbs.

1.2.2.2. Differences between RAs and popularised articles (henceforward PAs)

In early studies of popularised discourse (cf. Fahnestock 1986 and Crismore & Farnsworth 1990), the commonly held view, based on the notion that popular science spreads only well-established facts, was that it contained fewer hedges than RAs. These theories have since been disconfirmed by Vihla (1999, 2000) and Varttala (2001), who established that hedges were more frequent in popularisation, although they were used for other reasons.

Interestingly, Varttala (2001) found that "in the popular scientific articles hedging was most commonly realised by means of adverbs in each discipline" (p. 200) while modals were the most common hedging device in RAs.

Concerning the three adverbs under consideration, however, no details are provided, except that *maybe* is only used in PAs (cf. Vihla 1999, p. 51).

2. Aims and methods

2.1. Aims

The linguistic studies reviewed in 1.1 have focused on the syntactic properties of modal adverbs and have only marginally dealt with their semantics. A more serious criticism is that they have failed to take into account the wider contexts in

2 Note that Vihla (1999, 2000) works on a corpus of American English.

which these forms are used, even though the pragmatic dimension of modality is now commonly acknowledged.

By contrast, the discourse-oriented works mentioned in 1.2 do recognise the importance of such socio-pragmatic parameters in the analysis of linguistic data. However, as their priority is to characterise disciplinary discourses and genres with regard to the semantic categories of hedging and epistemicity, they have to consider whole classes of expressions and cannot focus on how a given marker contributes to the expression of a particular meaning and to what extent it differs from competing forms.

In this paper, we concentrate on three possibility adverbs because a fine-grained analysis of particular forms reveals as much –if not more– about a given discourse-type than over-sweeping generalisations based on purely quantitative analyses. We shall therefore determine whether these adverbs behave differently in RAs and in PAs and try to account for these differences by considering their functions in the contexts in which they are used.

2.2. The corpus

To conduct this research, a 600,000-word corpus of RAs and PAs covering three disciplines (history, philosophy and applied mathematics) was compiled. It includes texts published between 2000 and 2011 and written by British-born authors. RAs were taken from peer-reviewed academic journals while PAs were found in specialised magazines or journals targeting non-experts³.

2.3. Methods

Searches were carried out with the AntConc software. In order to sketch an overall picture of epistemic modality in the corpus, we first computed the frequencies of all the expressions of uncertainty. We then focused on *perhaps*, *maybe* and *possibly* whose every occurrence was classified according to its meaning, its

3 See appendix for details.

semantic scope, the structure within which it occurred, and its position. Particular attention was paid to the communicative function of the passage in which the adverb occurred.

3. Results

3.1. Quantitative overview of epistemic markers in the corpus

We first set out an overview of the epistemic expressions in our corpus so as to provide a broader context for the occurrences of *perhaps*, *maybe* and *possibly* within the local system of epistemicity. The abundant literature on this topic supplied us with an exhaustive list of forms we searched our corpus for: epistemic lexical verbs, modals, evidential verbs and modal adverbs (the list used here is Perkins' 1983). The results are featured in Tables 1 and 2.

Table 1. Modal verbs and auxiliaries

	RAs				PAs			
	History	Philosophy	Maths	Total	History	Philosophy	Maths	Total
<A> + Epistemic Verbs	11	281	156	448	6	188	26	220
Epistemic must, may and might	90	121	41	252	60	174	109	343
Evidential Verbs seem/appear	90	170	31	291	91	214	100	405
Total	191	572	228	991	157	576	235	968

Table 1 shows the number of epistemic and evidential modals and verbs in the corpus. The overall results reveal no significant differences between specialised and popularised discourses, but there exist variations in the use of the markers. The use of epistemic verbs with first-person subjects referring to the author(s)

(noted <A>) (e.g. *I don't know whether, We assume that*) appears to be characteristic of RAs⁴, while epistemic modals and evidential verbs are more prevalent in the popularised than in the specialised subcorpus.

Table 2 reveals that as far as modal adverbs are concerned, not all subcorpora behave in the same way: historians, for instance, make more use of modal adverbs in specialised discourse than in popularised discourse. Of course we have always been aware of such possible disciplinary differences, but we are not interested in those for the purpose of this paper as long as they do not disrupt general tendencies. Thus, considered as a whole, the popularised subcorpus still records more modal adverbs than the specialised one (632 vs. 504), which is in keeping with the tendency already observed.

Table 2. Modal adverbs

	RAs			PAs		
	History	Philosophy	Maths	History	Philosophy	Maths
Admittedly	1	0	0	1	2	2
Allegedly	3	0	0	4	0	0
Apparently	10	14	3	14	13	7
Arguably	4	3	0	5	10	1
Certainly	38	27	4	20	48	10
Clearly	35	28	16	15	29	5
Conceivably	0	2	0	0	1	0
Evidently	5	5	2	6	1	0
Hopefully	0	0	0	2	2	5
Likely	3	0	0	0	0	0
Maybe	0	4	5	0	23	6
Necessarily	12	13	16	2	31	8
Obviously	5	15	5	2	16	7

4 For an account of this phenomenon, see Pic and Furmaniak (2012a).

Perhaps	20	57	6	36	79	16
Possibly	12	1	14	10	12	12
Presumably	2	9	0	1	14	1
Probably	24	9	5	40	23	16
Purportedly	1	4	0	2	0	0
Reportedly	1	0	0	2	2	3
Reputedly	0	0	0	1	0	0
Seemingly	6	8	0	2	6	1
Supposedly	4	8	0	6	10	2
Surely	6	28	1	3	33	1
Total by discipline	192	235	77	174	355	103
Total by text-type	504			632		

Adding up all these forms, it appears that epistemics are more numerous in PAs (1600 markers altogether) than in RAs (1495 markers altogether). To try and understand these results, we now focus on *perhaps*, *maybe* and *possibly*.

3.2. Focus on *perhaps*, *maybe* and *possibly*

As we have seen in Table 2, the respective frequencies of the three adverbs under consideration follow the overall tendency as they occur more frequently in PAs. To approach the data from a more qualitative perspective, we first distinguished between different meanings of the markers. These semantic typologies were based on dictionary entries and on the analysis of the corpus.

3.2.1. Semantic classifications

3.2.1.1. *Perhaps* and *maybe*

The *Oxford English Dictionary for Advanced Learners* distinguishes between *perhaps* and *maybe* in terms of register –which may account for the higher

frequency of *maybe* in PAs— but not in terms of meaning. We therefore propose the same semantic typology for both adverbs⁵. The dictionary gives the five following senses for *perhaps* and *maybe*, to which we can add four uses on the basis of the corpus-analysis. Each meaning is commented upon and illustrated by an example from the corpus.

(i) **Conjectural use.** The speaker makes a hypothesis concerning the real world in which the state of affairs is entertained as a possibility. In general, this use is motivated by the speaker's genuine uncertainty. (6) illustrates.

(6) *There is a slim possibility that our choices are not wholly determined by heredity and environment. **Maybe** when we make a choice there is a genuine possibility that we could decide otherwise.*

(ii) **Tentative use.** The speaker qualifies his/her speech-act. The expression of doubt is secondary as the main function of this use is to make the assertion less blunt. Example (7), for instance, can be paraphrased as *Perhaps we can say that...*, which suggests that the adverb qualifies the assertion more than the speaker's commitment to the truth of the proposition.

(7) *The claim that God is a person or personal is, **perhaps**, one of the most fundamental claims which religious believers make about God.*

(iii) **Concessive use.** The speaker admits to the truth or possibility of the proposition but finds it irrelevant in comparison with the state of affairs described in the following clause. Consider (8).

(8) *Goffman suggests a fairly rigid division between front and back regions, which was **perhaps** a feature of twentieth-century American homes, but is less applicable to Georgian London.*

(iv) **Suggestion.** The speaker presents the state of affairs as a desirable possibility. In this use, *perhaps* and *maybe* typically collocate with a modal. (9) illustrates.

(9) *Then **perhaps** you should join a band of bell ringers, engaged in the grand old practice of ringing the changes.*

(v) **Approximator.** In this use, illustrated by (10), *perhaps* or *maybe* is employed to make a rough estimate.

(10) *(...) a weekly US audience of **perhaps** four million listeners.*

5 For this reason, and also because of the low frequency of *maybe*, the two adverbs are treated together in the remainder of this paper.

(vi) **Interpersonal use.** The speaker envisages as a possibility the readers' or others' expectations or reactions to what is being said, as in (11).

(11) *You may **perhaps** think that this constructive situation is rather complicated, and could be simplified by adding some extra axioms.*

(vii) **Adjustment.** In this use, exemplified by (12), the adverb is preceded by *or*, which introduces an alternative and better term to describe the situation referred to.

(12) *When discussing promising, he emphasises its usefulness in cultivating (or **perhaps** constituting) valuable human relationships (...).*

(viii) **Fictional use.** Here, *perhaps* and *maybe* are used to conjure up a possible alternative within a fictive scenario, as in (13) where, with minor syntactic changes, the adverb can be replaced by *for example* (cf. 13').

(13) *What I want to do is explore Happiness. Suppose when we indulge in some activity, **perhaps** attempting to solve a problem, or, as I tried, to understand understanding, we do so in pursuit of happiness.*

(13') *Suppose when we indulge in some activity, **for example** when we attempt to solve a problem (...).*

Table 3. *Perhaps* and *maybe*: semantic values

	RAs	%	PAs	%
Conjectural	46	50	77	48,1
Tentative	26	28,3	41	25,6
Concessive	2	2,2	9	5,6
Suggestion	1	1	5	3,1
Interpersonal	4	4,3	6	3,7
Adjustment	2	2,1	5	3,1
Approximator	2	2,1	2	1,2
Fictional	4	4,3	8	5
Indeterminate	5	5,4	7	4,3
Total	92		160	

Table 3 reveals how the different values of *perhaps* and *maybe* are distributed in the corpus. On the whole, the two adverbs are used along the exact same lines in RAs and PAs. In both text-types, the conjectural use makes up about 50% of

occurrences when the tentative use accounts for roughly 30% of occurrences. The other categories are not numerically significant and from now on the analysis will be based on the first two uses. It seems obvious that, at least in the case of *maybe* and *perhaps*, the quantitative gap between RAs and PAs is not due to variations affecting individual semantic types.

3.2.1.2. Possibly

Three main uses of *possibly* have been identified.

- (i) **Circumstantial possibility.** In this use, the speaker asserts that the state of affairs is *theoretically* possible without assessing its degree of likelihood. The boundaries between this use and the next one are fuzzy but in the clearest cases, as in (14), the speaker remains non-committal as to whether the state of affairs was/is/will be actualised.

(14) *...if we only hear about the successes, the evidence only tells us that it could **possibly** work, not how likely it is to work.*

- (ii) **Epistemic possibility.** This meaning resembles the conjectural use of *perhaps* and *maybe*. In (15), for instance, *possibly* expresses the speaker's relative confidence in the truth of the proposition.

(15) *Memories of the famine **possibly** goaded magistrates and parishes into more regular use of redistributive taxation to fund poor relief, but it is impossible to be certain.*

Yet, as shown by Tucker (cf. *supra*), this use of *possibly* does not exclude the sense of circumstantial possibility. In fact, we suggest that the speaker's knowledge that the state of affairs is theoretically possible serves as evidence for the epistemic assessment⁶.

- (iii) **Intensifier.** In non-assertive contexts, with *can* or *could*, *possibly* often functions as an intensifier (see Hoyer 1997, p. 176). However, as (16) is the only clear example of this kind in the corpus, it will be left out of the discussion.

(16) *(...) and asking how the Germans could **possibly** lecture Greeks on morality.*

6 For an analysis of *must* along the same lines, see Furmaniak (2010).

Table 4. *Possibly*: Semantic values

	RAs	%	PAs	%
Circumstantial possibility	15	56	12	35
Epistemic possibility	12	44	21	62
Intensifier	0	0	1	3
Total	27	100	34	100

Contrary to *perhaps* and *maybe*, the use of *possibly* is affected by the target audience, since it is predominantly an epistemic marker in PAs (62% of its instances in this text-type) whereas its value is mainly circumstantial in RAs (56%).

3.2.2. *Syntax*

3.2.2.1. Syntactic environments

The occurrences of the three adverbs were tagged according to the clause- (or constituent-) type in which they appeared⁷: a **main clause**, as in (17),

(17) *Maybe a weaker condition about character or experience than this is enough for personal identity.*

an **elliptical clause**, as in (18),

(18) *Some of the commissioners certainly wanted a much fuller charge, perhaps along the lines of the Commons' 1648 No Addresses Declaration.*

⁷ This nomenclature is based on Greenbaum (1969) and Tucker (2001).

a **relative clause**, as in (19),

(19) (...) a metaphorical account of divine omnipresence, which could **perhaps** be understood to mean either that God is close to the universe (...).

an **adverbial clause**, as in (20),

(20) Surprisingly, few people are Zoroastrians; though **maybe** that is not surprising (...).

a **nominal clause**, as in (21),

(21) Hence he can say that **perhaps** (...) the requisite carbon atoms were created either ex nihilo by God (...).

or **below the rank of clause**, as in (10) above.

Table 5. Syntactic structures within which *perhaps* and *maybe* appear

	RAs		PAs	
	Main clause	Elliptical clause	Main clause	Elliptical clause
Conjectural	20	18	43	27
Tentative	20	3	31	4
Other values	4	10	23	10
Total	44	31	97	41
%	45,8%	32,3%	59,5%	25,2%

Here again, we were unable to find any major difference between RAs and PAs. As illustrated in Table 5, *perhaps/maybe* occurring in a main clause is the dominant pattern in both text-types (though more markedly in PAs).

Structures other than main and elliptical clauses were not taken into account, as they were not numerically significant.

Table 6. Syntactic structures within which *possibly* appears

	RAs		PAs	
	Main clause	Elliptical clause	Main clause	Elliptical clause
Epistemic possibility	3	7	1	16
Material possibility	1	2	7	2
Total	4	9	8	18
%	14,8	33,3	23,5	52,9

Table 6 shows that *possibly* occurs mainly in ranks other than main clauses, which points to a major difference with *perhaps/maybe*. Note that the reason why Tucker (2001)'s results differ from ours is that he analysed elliptical clauses as main clauses.

3.2.2.2. Position

Following Greenbaum (1969), we distinguish between three main positions: initial, as in (22-23), medial, as in (24), and final, as in (25).

- (22) *Maybe* a weaker condition about character or experience than this is enough for personal identity.
- (23) Ultimately, it could discover more efficient foams than the ones currently known, and **possibly** even lead to a proof (...).
- (24) The martyrs **possibly** considered the potential danger posed to these benefactors (...).
- (25) They just think differently, **perhaps**?

Table 7. Positions of *perhaps* and *maybe*

	RAs			PAs		
	I	M	F	I	M	F
Total	66	17	1	114	33	4
%	78,5	20,2	1,2	75,5	21,8	2,6

Table 7 shows that –in RAs as well as in PAs– initial position (I) is predominant, followed by medial position (M), then marginally by final position (F), independently of the semantic value of *perhaps/maybe*. The distribution is once again strictly similar between RAs and PAs.

Possibly also occurs more frequently in initial position in both text-types, but it is worth noticing that the medial position is much more represented in the popularised subcorpus.

Table 8. Positions of *Possibly*

	RAs			PAs		
	I	M	F	I	M	F
Total	17	6	0	19	15	0
%	73,9%	26,1%	0,0%	55,9%	44,1%	0,0%

3.3. Semantic scope: Fact or evaluation

A close examination of the data reveals that the modal adverb can bear either on a fact or an evaluation. This opposition is based on van Dijk (1998) who defines facts as beliefs which are “socially accepted” and evaluations as beliefs “that presuppose [...] a value, and that involve [...] a judgement about somebody or something, [...] such as ‘X is good (bad, beautiful, ugly, honest, intelligent)’” (p. 29).

Although the distinction is sometimes blurred, evaluations *tend* to be formally associated with mental and relational predicates, as in (26-27), while facts *tend* to be expressed by existential and material predicates, as in (28-29)⁸.

- (26) **Perhaps** all we are supposed to take from the fable is that Dawkins naturalism is obviously lacking in meaning and purpose.
- (27) This is a very good result for statistics! But **perhaps** a bit lucky - in particular it is very difficult to predict draws (...).
- (28) **Perhaps** these are the waste gases given off by hardy bacteria living deep beneath the freezing Martian surface.
- (29) In fact many animals around the world were making predictions - porcupines, guinea pigs and so on. **Maybe** we are only hearing about the successful one (...).

Note that only the epistemic and tentative uses of the adverbs were taken into account.

Table 9. Scope of the three possibility adverbs

	RAs	%	PAs	%
Facts	24	30,4	69	53,5
Evaluations	55	69,6	60	46,5

Here, at last, some difference between RAs and PAs arises. In RAs, the possibility adverbs qualify more evaluations (55 occurrences) than facts (24 occurrences). This could be explained in terms of types of hedging. Being cautious about evaluations seems more consistent with interpersonal hedging than with content-hedging. In RAs, uncertainty is not about facts but about their interpretation. In PAs, however, the scope of the possibility adverbs is more balanced, though they mostly qualify facts. The mediator might be less cautious in his/her judgements because his/her addressees are non-experts, and uncertainty as a whole may be

8 This classification of process types is Halliday (1994)'s.

perceived by wider audiences as constitutive of science, hence the more frequent use of content-hedging.

To conclude on our findings, there seems to be no difference in the functions of possibility adverbs across text-types, except with regard to the fact/evaluation opposition. This suggests that the communicative functions of these adverbs are the relevant parameter to account for the difference in frequency between RAs and PAs.

4. Discussion

So why are there more possibility adverbs in PAs than in RAs? A more precise answer may lie in the examination of the communicative functions of the three adverbs.

4.1. Perhaps/maybe

To that effect, a comparison with the modal *may* is enlightening. Of course, *perhaps*, *maybe* and *possibly* are not systematically substitutable for *may*, mostly for syntactic reasons. As a modal obviously requires a complete clause, it cannot occur in elliptical clauses. We also considered the substitution unconvincing in questions and in sentences already containing another modal⁹.

We are more interested in those cases where the substitution is possible, as they point to the pragmatic and discursive differences between the modal and the three adverbs. *Perhaps/maybe* and *possibly* do not differ from one another in terms of degree of probability, nor do they differ from the modal *may* in that respect (see *inter alia* Tucker 2001). For instance, (30) and (30') both express a low degree of probability:

(30) *That she was also an experienced stepmother perhaps added to her general appeal, but the king wanted a wife for himself (...).*

9 Of course *possibly* is not substitutable for a modal when it qualifies an adjective (see *supra*).

- (30') *That she was also an experienced stepmother **may** have added to her general appeal, but the king wanted a wife for himself (...).*

The most obvious aspect of this modal/adverbs comparison concerns the packaging of information. We have seen that, in our corpus, the predominant position for all three adverbs was the initial position. In that case, the difference with the modal –compulsorily in medial position– is undeniable. While the hypothetical status of the clause is clearly foregrounded by the adverb in (31), it becomes backgrounded when a modal in medial position is used, as in (31').

- (31) ***Maybe** lightning struck some chemicals dumped in a swamp and triggered spontaneous cellular activity that issued in me.*
- (31') *Lightning **may** have struck some chemicals dumped in a swamp and triggered spontaneous cellular activity that issued in me.*

This difference in terms of focused information and foregrounding of the hypothetical nature of the proposition logically disappears when the possibility adverb is in medial position. Examples (32) and (32') do not differ at all in terms of information packaging.

- (32) *Just how much the ascendancy of America can be explained by its written constitution is moot. Americans have **perhaps** overrated its significance.*
- (32') *Just how much the ascendancy of America can be explained by its written constitution is moot. Americans **may** have overrated its significance.*

A closer examination of the data confirms that evidentiality is the parameter with respect to which *perhaps* and *maybe* differ the most from *may/might*. Like *must* (cf. de Haan 2009), *may* and *might* have an evidential component (cf. Alonso-Almeida and Cruz-García 2011) in that they indicate that the speaker's conjecture is based on some evidence, which can be overt, as in (33), or covert, as in (34).

- (33) *The back parlour in Queen Square **may** have been a gentleman's room, as it contained bookshelves, a desk, a fishing rod, pistols, and walking sticks in addition to a card table.*
(RA)

- (34) *The development of poor relief in Lancashire is important as a case study of wider historical processes, but regional peculiarities inevitably militate against generalizations. Distance from London and the county's palatine status **may** have entrenched a culture of magisterial self-rule (...).* (RA)

By contrast, we saw earlier that *perhaps* and *maybe* have no evidential meaning. (35), for example, conveys what appears as a spontaneous conjecture, that is, a hypothesis that seems to be made 'out of the blue' without any implications that the modal assessment rests on any kind of evidence.

- (35) (...) *Pete's throwing apparently wasn't real or ordinary throwing, because the stones were never seen in flight. It was as if they just fell at their destination. **Perhaps** it's done by thought (but how do you think without a brain?).* (PA)

The contrast between *perhaps* and *may* in that respect is obvious in (36). While *may* presents a conjecture based on the evidence provided by the diary, the proposition introduced by *perhaps* is mere speculation: scholars have no material evidence and, anyway, an assumption concerning a mental state (*more willing*) is necessarily highly speculative.

- (36) (...) *the diary suggests that landladies who lived alone, or with a female relative, **may** have had access to similar amounts of space as their lodgers and were **perhaps** more willing to bend to a lodger's demands than a landlord or married landlady. Sadly, no diaries of female lodgers in this period have come to light...* (RA)

The same analysis applies to the tentative use of *perhaps* and *maybe*. (37) illustrates.

- (37) (...) *on reflection we see that it too is not wholly tied down and could be done in various ways. On second and more cheerful thoughts, it **perhaps** is not important if norms are not algorithmic. For they can at least formulate constraints on or advice for action (...).* (RA)

The extemporariness of the epistemic assessment marked by *perhaps* and *maybe* is also consistent with the relatively high frequency of *or* before *perhaps* or *maybe*,

as in (38)¹⁰, where *or* presents the assumption as an off-the-cuff afterthought rather than as a carefully thought-out hypothesis.

(38) *What Schopenhauer has somehow overlooked, or perhaps even failed to notice, however, is that his metaphysics of the Will implies a quite different story about the nature of intellect.* (RA)

An examination of the communicative contexts in which *perhaps* and *maybe* appear throws light on a recurring rhetorical pattern that seems to exploit the non-evidential status of the adverbs. Indeed, *perhaps* and *maybe* are regularly used in what we shall call explicative passages.

Explication here refers to a rhetorical passage (cf. Adam 1992) or a mode of discourse (cf. Smith 2003) that is defined according to formal and pragmatic criteria. The explicative mode is a subcategory of Smith's informative mode. Linguistically, the informative passage is characterised by the predominance of general statives (i.e. non-specific situations) and by the absence of temporal progression. Pragmatically, it conveys uncontroversial information. The explicative mode shares these properties but differs from the unmarked mode –which we call expository– with respect to its structure and the knowledge asymmetry it presupposes between writer and reader. As pointed out by Adam (1992), explicative passages have the following prototypical structure: (i) an uncontroversial fact (F) is posed, (ii) a question/problem concerning F is raised, (iii) the explanation proper is put forward, and (iv) a conclusion/evaluation is offered. (39) is a typical example of the explicative mode. A consensual enough observation is made (see underlined segment), followed by two questions and an attempt to answer them (in bold).

(39) *Moreover, if achievements are finally valuable at all, then the successes attained by Tiger Woods and Rafael Nadal in these cases are certainly finally valuable. So what is going on here? Why are some easy successes achievements, and hence in the market for final value, and some not? **I think the answer to this question lies in the fact that we have a bifurcated conception of achievements.*** (PA)

10 11.9% of all occurrences of *maybe* and *perhaps* are preceded by *or* (mainly in their conjectural use) while *or/possibly* and *or/may* have a co-occurrence rate of only 5% and 0.7%, respectively.

The data suggest that *perhaps* and *maybe* are highly compatible with that kind of context in PAs. They often appear at stage (iii) of the explicative passage, especially in segments where the explanation proves problematic. In (40), for example, a problem is posed (*Eliot's lines escape sense*) and a series of unanswered questions are asked to try and explain it – to no avail – as if the discourse has reached a dead-end. *Perhaps* seems therefore to be used as a highly tentative, extemporary ‘last-resort’ attempt to explain the problem to which no solution has been brought.

(40) *Eliot's lines, Carey maintains, 'escape sense'. He points out that there is much scholarly debate about what the three leopards represent ; Are they a reference to I Kings 19? Is there an allusion to Jakob Grimm's story (...), and/or to the portrayal of leopards to be found in medieval literature? Is there significance in the order in which Eliot's leopards devour their victim? 'We cannot tell. Nor do we know how serious Eliot is being.' Perhaps the leopards are metaphorical; perhaps they are to be viewed as heraldic emblems. We have also to decide on the identity of the 'Lady' being addressed, though there is nothing in the rest of the poem to clarify it. So we must do our best to fabricate some sort of identity for her too.* (PA)

The analysis of such passages also confirms what we said earlier about *perhaps* and *maybe* being so frequent in initial position. In this position, they clearly serve a discourse function in warning the reader that what follows is pure guesswork while providing a potential escape from a rhetorical dead-end –especially in combination with cohesive *or* which, as noted by Halliday & Hasan (1976), introduces “another possible opinion, explanation, etc. in place of the one just given” (p. 245-246).

(41) is yet another illustration of the use of *perhaps* in explicative sequences. The question/problem is posed indirectly by the underlined sentence, and *perhaps* tentatively introduces a risky analogy by way of explanation – a strategy that is also typical of explicative passages (see Moirand 1999).

(41) *Provided a system instantiates the right functions, it can be fully conscious, regardless of its physical composition. Not what minds are made of, but what they do, is the key. Perhaps mind is to brain as computer programmes are to their supporting hardware, so you can run the same consciousness on different computational vehicles.* (PA)

The semantic and discursive functions of *perhaps/maybe* therefore provide a plausible explanation for the higher frequency of these two adverbs in popular science. First, experts addressing experts are not expected to make bold ungrounded hypotheses but to base their conjectural evaluations (remember that in RAs, *perhaps* and *maybe* rarely bear on facts) and tentative assertions on sound evidence. Second, they do not need/want to explain facts (we have seen that explaining implies a knowledge asymmetry which might be face-threatening in RAs) but to argue their point convincingly.

4.2. Possibly

The results concerning *possibly* are easier to account for. No difference in absolute value between RAs and PAs was noted as far as the circumstantial use was concerned. This comes as no surprise given that, in this sense, the adverb refers to an objective possibility whose existence is presented as based on the writer's expertise. In (42), for instance, the expert addressing his/her peers does not jeopardise his/her positive face by making some wild guess. S/he is just referring to a reasonable theoretical possibility.

(42) *The set of locally finite stability conditions can be topologized so that it is a, **possibly** infinite-dimensional, complex manifold, which we denote by $Stab(C)$.* (RA)

Conversely, the fact that epistemic *possibly* is employed less frequently in RAs than in PAs can be explained by the writer's desire to protect his/her positive face in front of his/her peers. In this reading, *possibly* is comparable to *perhaps/maybe*, since they are used respectively 1.8 and 1.6 times more in PAs than in RAs. This would suggest that, despite its firm evidential basis, epistemic *possibly* is already too speculative to be used extensively in academic context. In (43), for instance, although *possibly* does not modify the content of the subordinate clause which seems certain (*perhaps* would qualify the whole proposition –compare with (43')) the causal relation over which *possibly* has scope is still highly conjectural.

(43) *Overtly patriotic or warlike names were uncommon, **possibly** because more violent designations were considered unlucky.* (PA)

- (43) *Overtly patriotic or warlike names were uncommon, **perhaps** because more violent designations were considered unlucky.*

Unlike *perhaps/maybe*, epistemic *possibly* seems to be preferred in expository passages, as in (44), but also in narration, as in (45). The fact that epistemic *possibly* seems attracted to two modes that have been shown (cf. Pic and Furmaniak 2012b) to be more typical of popular science may already explain –at least quantitatively – its higher frequency in PAs.

- (44) *This was to be expected: like all suspension bridges it is rather flexible. What was not expected was that these small motions would affect the way that the people walked and lead to a positive bio-feedback loop. Feeling the small motions underfoot, people adjusted their steps, **possibly** subconsciously, in order to walk more comfortably. This meant adjusting their footfall to move in synchronisation with what the bridge was doing. However, this reinforced the motion, leading to larger oscillations, which then caused more people to join in, and so forth. (PA)*

- (45) *First let's look at the evidence. Paul, resident of Oberhausen Sea World in Germany but originally from Weymouth, likes eating mussels. His keepers lowered a pair of boxes into his tank before each match, each containing a mussel and labelled with the flag of the country of one the competing teams. Paul then squozed his way into one of the boxes and grabbed a mussel: the country whose box was entered was declared as Paul's prediction. He, or **possibly** a look-alike, had previously made predictions in Germany's six matches in the Euro 2008 competition, but picked Germany's box each time giving rise to suggestions that he was attracted to the German striped flag. Four out of six of these predictions were correct. (PA)*

In both modes, which are highly factual and (presented as) uncontroversial, epistemic *possibly* is used to make a conjecture 'in passing' about elements that seem secondary. This is corroborated by the fact that it mostly appears in initial position of elliptical clauses –in particular, parenthetical clauses (see (44-45))– where it is also frequently preceded by a coordinator (especially *and*). However, while *or* combined with *perhaps/maybe* to introduce an alternative explanation, the pragmatic function of *and* and *or*, when used before *possibly*, is rather to add a parenthetical conjectural comment.

5. Conclusion

Epistemic markers are more numerous in the popularised section of our corpus. *Perhaps*, *maybe* and *possibly* do not depart from this observation. However, our syntactic and semantic analyses of these adverbs could not account for this difference. A more satisfactory explanation, especially regarding *perhaps* and *maybe*, came from an examination of their communicative functions. As they occur mostly in initial position, these two adverbs tend to foreground the purely hypothetical nature of the proposition, which, furthermore, is not supported by any evidence but seems to be spontaneously made by the speaker as some wild guess, whose purpose is to explain a fact to the reader.

If such hypotheses were too numerous in RAs, they would be severely received, as readers of RAs are peers who do not accept unsupported conjectures and do not expect to be treated as less knowledgeable. On the contrary, they are welcome in PAs where they contribute to a useful rhetorical function – explanation.

Possibly does not obey the same logic. In its circumstantial meaning, it expresses an objective possibility based on the writer's knowledgeability, which makes it fit for –but not reserved to– RAs. Epistemic *possibly*, however, like other epistemics, is less frequent in RAs. The reason for this is that epistemic *possibly* is mostly used in informative and narrative passages –which happen to be more typical of PAs.

Although much remains to be done to better understand the linguistic variations between RAs and PAs and the properties of modal adverbs, we hope to have shown that the three adverbs scrutinised possess pragmatic and discursive characteristics that throw light upon their use in context and that an adequate characterisation of text-types should not be limited to a mere counting of forms but requires a fine-grained analysis of the data.

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Appendix

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Analysis

European Journal of Philosophy

Journal of Moral Philosophy

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