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Towards a conceptual framework for conspiracy theory theories

Niki Pfeifer[a]*

[a]*Department of Philosophy, University of Regensburg, Regensburg, Germany*

*niki.pfeifer@ur.de

Abstract

I present a conceptual framework for classifying generalist and particularist approaches to conspiracy theories (CTs). Specifically, I exploit a probabilistic version of the hexagon of opposition which allows for systematically visualising the logical relations among basic philosophical positions concerning CTs. The probabilistic interpretation can also account for positions which make weaker claims about CTs: e.g., instead of claiming 'every CT is suspicious' some theorists might prefer to claim 'most CTs are suspicious' and then ask about logical consequences of such claims. Finally, I illustrate the proposed conceptual framework by selected claims about CTs drawn from the CT research literature.

Keywords: conspiracy theory research; conceptual framework; logical relations; particularism versus generalism, probabilistic hexagon of opposition

Introduction

Various approaches to the investigation of conspiracy theories (CT) have emerged in recent years, embracing diverse disciplines like philosophy, psychology, political science, history, etc. (e.g., Coady 2006; Dentith 2018; Butter and Knight 2020). In philosophy, basic positions concerning the epistemic status of CTs can be classified along the lines of claims like (see, e.g., Dentith 2019, 94; see also Buenting and Taylor 2010):

(1) CTs are *prima facie* false.

(2) CTs are not *prima facie* false, but there is something about such theories which makes them suspicious.

(3) CTs are neither *prima facie* false nor typically suspicious.

Claims (1) and (2) are typically associated with 'generalist' positions, as they make general claims about CTs. Claim (3) is associated with 'particularist' positions.[1] While generalists seek to identify universal features of CTs, particularists claim that CTs should be analysed individually and deny that there are features which are shared by all CTs.

The aim of this paper is to develop a conceptual framework for classifying theoretical positions concerning CTs; specifically, to provide a method to make basic logical relations among claims about CTs explicit, as well as to visualise them. Moreover, borrowing tools from probability logic, I argue that research about CTs would profit from using *degrees of belief* (instead of *truth values*) to investigate CTs. Specifically, since CTs typically emerge in situations of partial and incomplete knowledge, and under uncertainty, I suggest that probabilistic terms should be used, since the truth values *true* and *false* are too coarse to evaluate CTs. For example, using classical logic, the argument 'if I take the train at six, then I'll be home at seven (if E_1, then E_2), I take the train at six (E_1); therefore, I'll be home at seven (E_2)' is logically valid (it is an instance of *modus ponens*: formally, from the premises $E_1 \rightarrow E_2$ and E_1 infer the conclusion E_2): this means that it is impossible that all premises are true while the conclusion is false. Knowing that an argument is logically valid is useful if you also know that the premises are true, because then, the conclusion must be true. However, if at least one premise is

[1] See the first article by M R. X. Dentith (forthcoming a) in this special issue for coverage of what generalism and particularism are.

false or if you don't know the truth value of the premises, you cannot make an informative inference about the conclusion: it might be true or false. In our example, it could indeed be the case that you miss the train or that the train is delayed. I suggest, therefore, to evaluate the premises probabilistically. Degrees of belief allow us to assess the probability of claims on the unit interval [0,1], with the extreme values *zero* and *one* as its minimum and maximum probability value, respectively. Degrees of belief can be expressed in terms of point-values or in interval-valued terms. The latter is especially useful to express your uncertainty about the assessment. For example, if you know that some event E is probable, but you don't want to confine yourself to a precise value, you can assess it with a threshold value x, where $0.5 < x \leq 1$. In the extreme case, when you don't know anything about the probability of the occurrence of an event E, you may assign the unit interval to this event, i.e., $0 \leq p(E) \leq 1$, which also implies that the negation of E is assessed by the unit interval, i.e., $0 \leq p(\neg E) \leq 1$. As soon as you commit yourself to some degree of belief in E, you are of course required, by the rationality standards of probability theory, to commit yourself to a corresponding complementary degree of belief in $\neg E$: in general, the equation $p(E) + p(\neg E) = 1$ must be satisfied, which also holds for interval-valued assessments. Interval-valued probabilities also naturally arise, even if you start reasoning with precise probability values.

As an example, consider the *probabilistic modus ponens* (e.g., Pfeifer and Kleiter 2009). From the two point-valued premise probabilities $p(E_1) = 0.7$ and $p(E_2 \mid E_1) = 0.8$ you can only infer the following conclusion probability: $0.56 \leq p(E_2) \leq 0.86$. Additional probabilistic constraints are needed to obtain a precise conclusion probability in this case. In the probabilistic modus ponens, for example, knowing the precise value of $p(E_2 \mid \neg E_1)$ would yield a point-valued conclusion. Moreover, in the particular case, when all premise probabilities are equal to one, the conclusion probability is precise and equal to one: from $p(E_1) = 1$ and $p(E_2 \mid E_1) = 1$ infer $p(E_2) = 1$. Probability logic provides methods and tools for propagating the uncertainty of the premises to the conclusion.[2]

Probabilistic thresholds (i.e., half-open probability bounds) are useful to make qualitative claims like 'event E is at least (highly) probable' explicit, by $p(E) > x$, where x is an appropriate threshold ($0.5 < x \leq 1$). This does not mean that explicit thresholds or probability values are needed to discuss claims about CTs. Rather, discussions about CTs can be done in qualitative and comparative terms, like 'this CT is improbable' or 'one CT is (much) more probable than another one', respectively. For example, it appears much more probable that a conspiracy was involved in the assassination of Gaius Julius Caesar, compared to CTs involving so-called shape-shifting reptilians, as put forward by David Icke. In case one wishes to make the probability of 'this CT is improbable' explicit, one can refer to the corresponding probability value. For instance, one may have a very low degree of belief in 'CTs involving shape-shifting reptiles', even with a probability equal to *zero*.

As claims about CTs are typically (at least initially) about single case events, like 'a conspiracy was involved in the death of Gaius Julius Caesar on March 15, 44 BC', the choice of an appropriate interpretation of probability is important.[3] It is well

2 For a gentle introduction to probability logic see Pfeifer (2021) and for more technical details see, e.g., Coletti and Scozzafava (2002) and Hailperin (1996).

3 Of course claims about CT events can be analysed from different levels of abstraction. The Caesar example is an instance of high abstraction. As pointed out by Keeley (1999), however, CTs make claims about many events, like the particular episodes leading to the assassination of Cesar. CTs also contain claims about *errant data* (Keeley 1999) like events not explained by the received view or events which actually contradict claims made within the received view. Still, I argue, an important

known that some interpretations of probability do not allow for assessing single case events, like most frequentistic interpretations of probability, which are hence inappropriate to assess claims about CTs. I propose to use a subjective approach to probability, which allows for assessing single case events. Specifically, I advocate the coherence approach to probability, which was originated by Bruno de Finetti. It has been further developed in the last few decades (for an overview see, e.g., Coletti and Scozzafava 2002).

In betting terms, *coherence* means the avoidance of uniform sure loss (no *Dutch book*). It is a subjective approach to probability, where probabilities are interpreted as degrees of belief. It has many technical advantages, including the ability to assign (point- and interval-valued) probability to single case events, to assess conditional probabilities directly (and not via the fraction of the joint and marginal probabilities, hence the coherence approach avoids problems with zero-probability conditioning events), and being nonmonotonic (i.e., allowing for retracting conclusions in the light of new evidence). Moreover, the coherence approach has received strong empirical support by experimental-psychological experiments, which highlight not only its normative but also its descriptive advantages (see, e.g., Pfeifer 2021, Pfeifer and Kleiter 2005; 2011).

Sanfilippo and I (2017) proposed a probabilistic version of the square and hexagon of opposition within the framework of coherence, which will constitute the basis for the conceptual framework for CT theories advocated in this paper. Before we

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class of these events (of whatever level of abstraction) are single case events, which occur only once at a certain time and place. The probabilistic interpretation I propose to use for the analysis of CTs is able to treat both, single case-events and types or classes of (replicable) events.

turn to its probabilistic version, however, a few words on the traditional square of opposition are in order.

The traditional square and hexagon of opposition

The square was designed to analyse logical relations among the following four basic (syllogistic) sentence types:

- universal affirmative (A): Every *S* is *P* (All *S* are *P*)
- universal negative (E): Every *S* is not *P* (No *S* are *P*)
- particular affirmative (I): Some *S* is *P* (At least one *S* is *P*)
- particular negative (O): Some *S* is not *P* (At least one *S* is not *P*)

The basic logical relations among the basic sentences are explained as follows (see, e.g., Parsons 2021):

- Two sentences are *contraries* iff they cannot both be true.
- Two sentences are *subcontraries* iff they cannot both be false.
- Two sentences are *contradictory* iff they cannot both be true and they cannot both be false (i.e., the sentences are both, contraries and subcontraries).
- A sentence S_1 is a *subaltern* of a sentence S_2 iff S_1 follows logically from S_2 (i.e., if S_2 logically implies S_1).

Although Aristotle distinguished contradiction and contrariety, drawings of the full diagram as a square appeared later, e.g., in the work of Apuleus in the 2nd century CE (Béziau 2012). Logical analyses of the square were popular in medieval times and the square has recently been revisited, including in seven world conferences (see, e.g., Beziau and Read 2014; Dubois and Prade 2012).

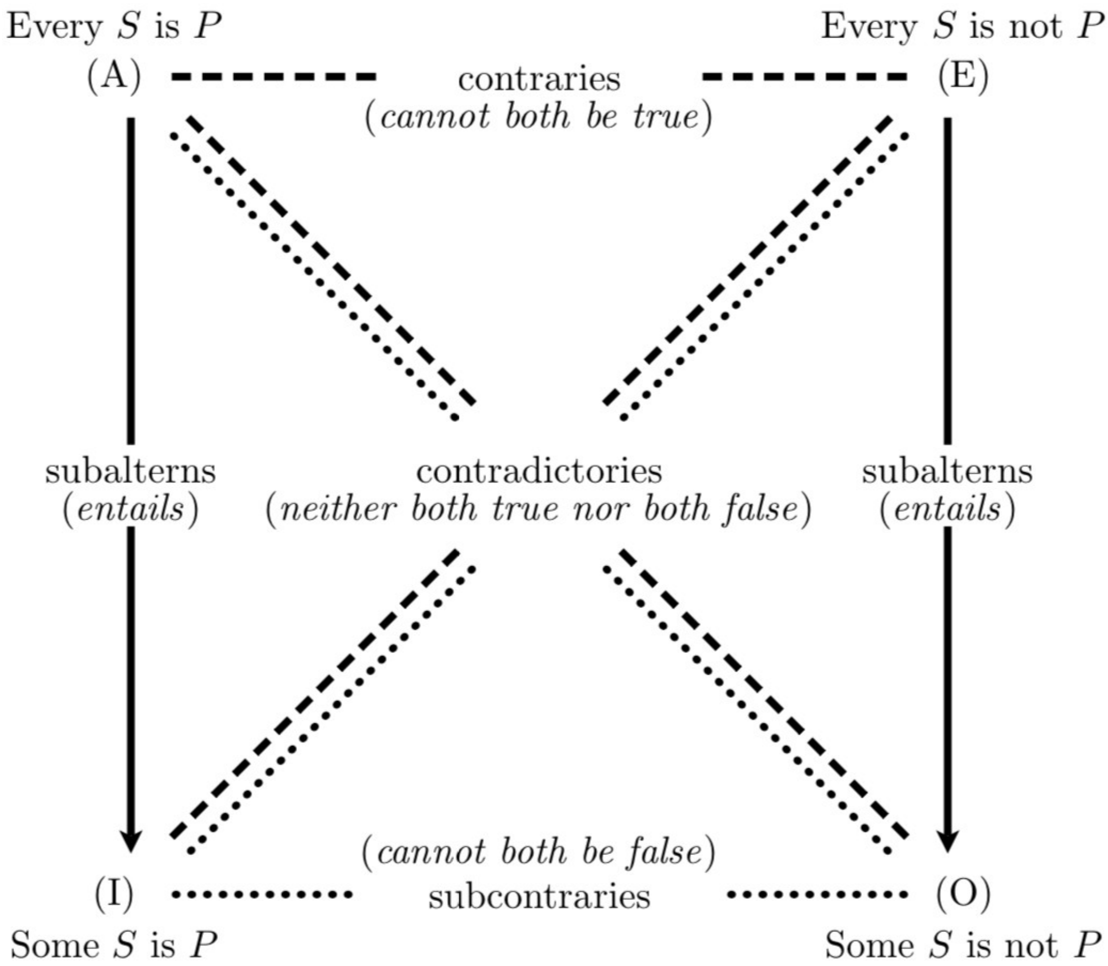

Figure 1: The traditional logical square of opposition.

Figure 1 presents the traditional square of opposition. The basic syllogistic sentence types constitute the corners and the logical relations are indicated by the connections among the corners of the square. Note that in Aristotle's logic and in usual constructions of the logical square, the sentence 'Every *S* is *P*' presupposes the *existence assumption* that the *S* term is not empty. This existence assumption is traditionally called *existential import assumption*. In predicate logical terms, (A) ‘Every *S* is *P*’ should hence be formalised by the conjunction

$\forall x(Sx \supset Px)$ and $\exists x Sx$,

where the latter formula makes the existential import assumption explicit. Without this existential import assumption, (I) would not be a subaltern of (A), as $\forall x(Sx \supset Px)$ could be vacuously true (i.e., when there is no *x* which has the property *S*) and in this case, $\exists x(Sx \wedge Px)$ would be false.

Compared to the almost two millennia long history of investigations on the square of opposition, its generalisation to the *hexagon of opposition* was rather recent in the early 1950s (Blanché 1952; Sesmat 1951). The hexagon is constructed from the square by adding at the top the sentence type (U) and at the bottom of the square the sentence type (Y), and by working out all logical connections among the six sentence types. (U) denotes the disjunction of the universal claims (A) and (E), which can be interpreted as *non-contingency* (since the contingent sentences are ignored and only the extremes *all* and *none* are considered). (Y) denotes the conjunction of the particular claims (I) and (O), which can be interpreted as *contingency* (since the extreme universal claims (A) and (E) are excluded). As the square of opposition is properly contained in the hexagon of opposition and the latter is considered to provide the full picture of all logical relations, we will focus on the hexagon for completeness.

Let us now turn to the probabilistic interpretation of the hexagon of opposition and its application to the various research positions regarding CTs.

The probabilistic hexagon of oppositions applied to CTs

Following my and Sanfilippo’s work (2017; see also Gilio, Pfeifer and Sanfilippo 2016), the basic syllogistic sentence types are interpreted as follows:

- Every *S* is *P* (A): $p(P|S) = 1$

- Every S is not P (E): $p(\text{not } P|S) = 1$ (equivalently: $p(P|S) = 0$)
- Some S is P (I): $p(P|S) > 0$
- Some S is not P (O): $p(\text{not } P|S) > 0$ (equivalently: $p(P|S) < 1$)

Interpretations of basic syllogistic sentences in terms of conditional probabilities have also been proposed, e.g., by Chater and Oaksford (1999). However, while their approach is based on the fraction definition of conditional probability, and hence needs to presuppose $p(S) > 0$ (since here $p(P|S)$ is defined by $p(P \text{ and } S) / p(S)$ and fractions over zero need to be avoided), this assumption is not made in the coherence approach. The coherence approach makes only the much weaker assumption that the conditioning event must not be a contradiction (i.e., if S is contradictory, then $p(P|S)$ is undefined). The assumption that the S term must be non-contradictory can be seen as the (only needed) existential import assumption made in the probabilistic hexagon.

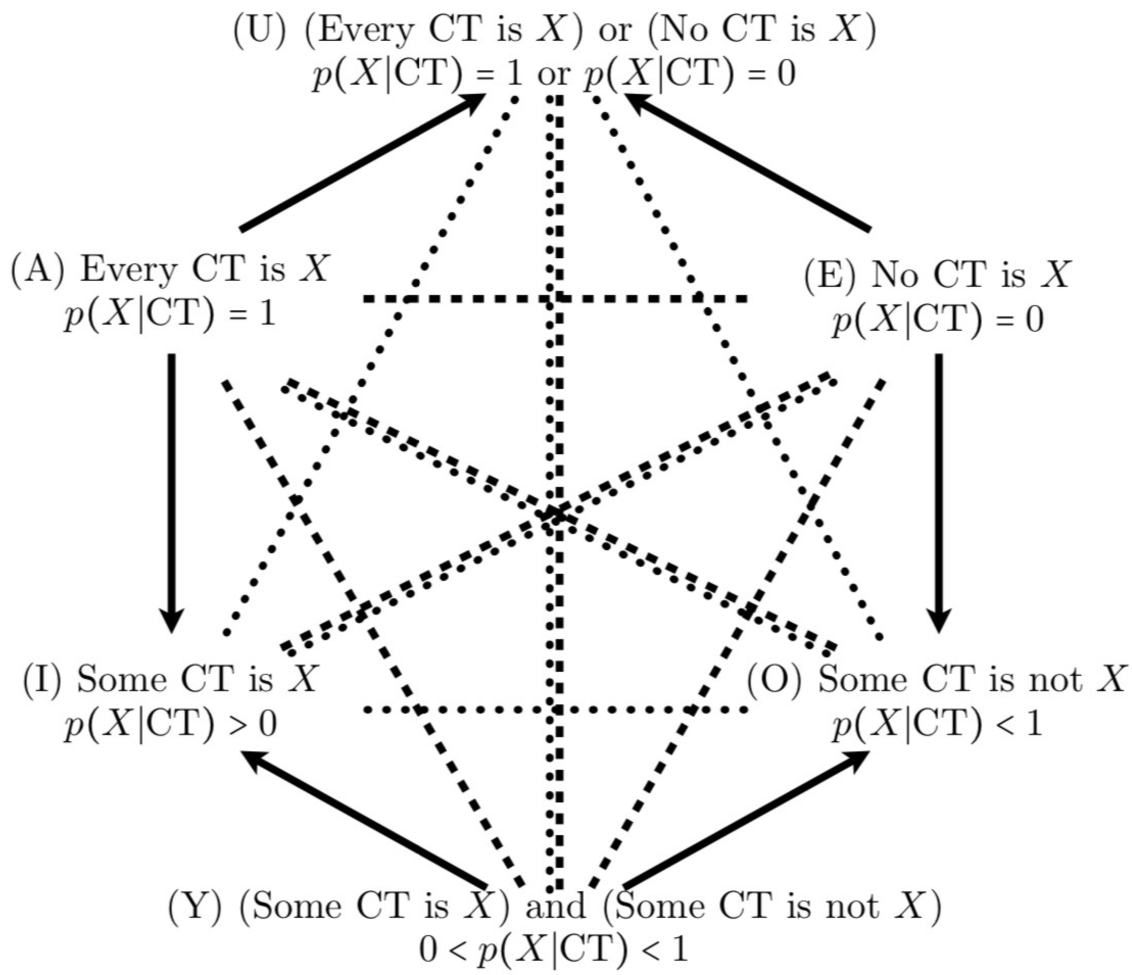

Figure 2: Probabilistic hexagon of opposition on claims about conspiracy theories (CT) with classical quantifiers, where *X* can be substituted by the predicate of the claim. The arrows, dashed, and dotted lines indicate the respective logical relations as presented in Figure 1.

Figure 2 presents the probabilistic hexagon of opposition instantiable with claims about conspiracy theories. Sanfilippo and I (2017) have proven that all logical relations among the corners in the probabilistic hexagon are inherited from the logical version of the square. This visualises all logical relations among the claims and makes them explicit.

By replacing *X* in the corners of the hexagon we obtain claims about CTs. For instance, at corner (A), we can construct claims like

- Every CT is *prima facie* false.
- Every CT is neither prima *facie false* nor suspicious.
- Every CT is believed because of mental disorders.
- Every CT is potentially harmful for society.
- Every CT is a good explanation of events.
- Etc.

Generalist positions, which are characterised by making universal claims, are principally located at the (A), (E), and (U) corners of the hexagon.

Claims like (all) ‘conspiracy theories are a subset of false beliefs’ (Swami and Furnham 2014, 220) or ‘[c]onspiracy theories—fears of nonexistent conspiracies—are flourishing in the United States’ (Pipes 1997, 1) are located at the (A) corner of the hexagon. The former claims explicitly that CTs are false (beliefs) and the latter indirectly, by suggesting that CTs are fears of something which ‘exists only in the imagination’ (Pipes 1997, 20). Famously, Popper’s general rejection of what he called the ‘conspiracy theory of society’ (Popper 2006) is also located at corner (A): every such CT is a faulty explanation of historical events. Another example is given by Napolitano, who argues ‘that conspiracy theories are only those conspiracy-beliefs that are self-insulated. What I mean by ‘self-insulated’ is that the believers take the conspiracy to neutralize the relevant counter-evidence’ (2021, 87). Moreover, she argues ‘that conspiracy theories so understood are always irrational’ (2021, 102), which is a claim of type (A).

Although it is conceptually possible, it might be hard to find CT theorists who claim ‘No CT is *prima facie* false’. Thus, the (E) corner might be empty, since there seem to be no CT theorists who make claims like ‘Every CT is *prima facie* true’ or ‘All

CTs are warranted'. Of course, when 'false' is replaced in 'No CT is *prima facie* false' by 'true', the (E) corner is occupied, while the (A) corner remains empty. As (U) is a subaltern from (A) and from (E), (U) is nonempty.

Particularist positions are located at the lower half of the square, specifically at the (I), (O), and (Y) corners. CT theorists who can be located at the (Y) corners are, for example, Charles Pigden (1995) and M R. X. Dentith (2014). Typical particularist arguments for claims of the sentence type (Y) are for example 'I am not saying that conspiracy theories can explain everything. Sometimes they work and sometimes they do not. It is a case of suck it and see' (Pigden 1995, 5). The latter claim fits onto the bottom of the hexagon as follows:

(Y): (Some CTs provide successful explanations of events) and (Some CTs do not provide successful explanations of events)

Since (I) and (O) are subalterns from (Y), CT theorists who claim (Y) also imply claims about (I) and (O). For example, Dentith's observation that 'even if there is some general argument that justifies taking a dim view of conspiracy theories, this does not give us grounds for dismissing the possibility that some *particular* conspiracy theory can be warranted' (Dentith 2014, 5) boils down to the following claim:

(I) Some CTs may be warranted.

Finally, we observe that generalist claims about CTs logically imply particularist claims in the following sense: claims of type (I) are subalterns of claims of type (A). Likewise, claims of type (O) are subalterns of claims of type (E). Moreover (U) is a subaltern of (A) and of (E), and (I) and (O) are subalterns of (Y).

In the next section we generalise the conceptual framework for dealing with claims about CTs involving generalised quantifiers. A similar claim of type (I) is given by Hagen (2022, abstract, my emphasis), who explicitly uses the 'Some' quantifier: 'I argue [...] that there are good reasons to think that *at least some* types of conspiracies do not tend to fail'. Finally, another instance of a type (I) claim is given by Keeley (1999, 126): 'we want to believe in *at least some* conspiracies—for example, Watergate and Iran-Contra'.

The generalised probabilistic hexagon of oppositions applied to CTs

The probabilistic semantics of the traditional hexagon of opposition can naturally be generalised towards a hexagon involving generalised quantifiers. While the traditional quantifiers of logic may be conceived as being too strict ('all' does not allow for exceptions) or too weak ('at least one' quantifies over at least just one object) for everyday life applications, generalised quantifiers like 'most' or 'almost-all' provide a more fine-grained and realistic vocabulary. Although 'All *S* are *P*' understood as a corresponding conditional probability equal to one allows for exceptions, it seems natural to exploit the full range of probability values between the extremes *zero* and *one*. Following again Pfeifer and Sanfilippo (2017), the basic syllogistic sentence types involving generalised quantifiers Q, defined on a probabilistic threshold $x > 0.5$, are interpreted as follows:

- $Q_{\geq x}$ *S* are *P* (A(x)): $p(P|S) \geq x$
- $Q_{\geq x}$ *S* are not *P* (E(x)): $p(\text{not } P|S) \geq x$
- $Q_{> 1-x}$ *S* are *P* (I(x)): $p(P|S) > 1-x$
- $Q_{> 1-x}$ *S* are not *P* (O(x)): $p(\text{not } P|S) > 1-x$

The semantics of the quantifiers in statement schemes like 'Most *S* are *P*' or 'Almost all *S* are *P*', as well as their respective negated and particular counterparts, can be made explicit by choosing appropriate thresholds. The thresholds can be chosen flexibly and are context, domain, and time dependent. For example, the quantifier threshold for 'Many elephants are in the circus' is lower compared to 'Many ants are in the garden'.[4] Likewise, the threshold for the quantifier in 'Few people believe that a conspiracy caused a pandemic of respiratory syndromes' may differ if this claim is made before or during the COVID-19 pandemic.

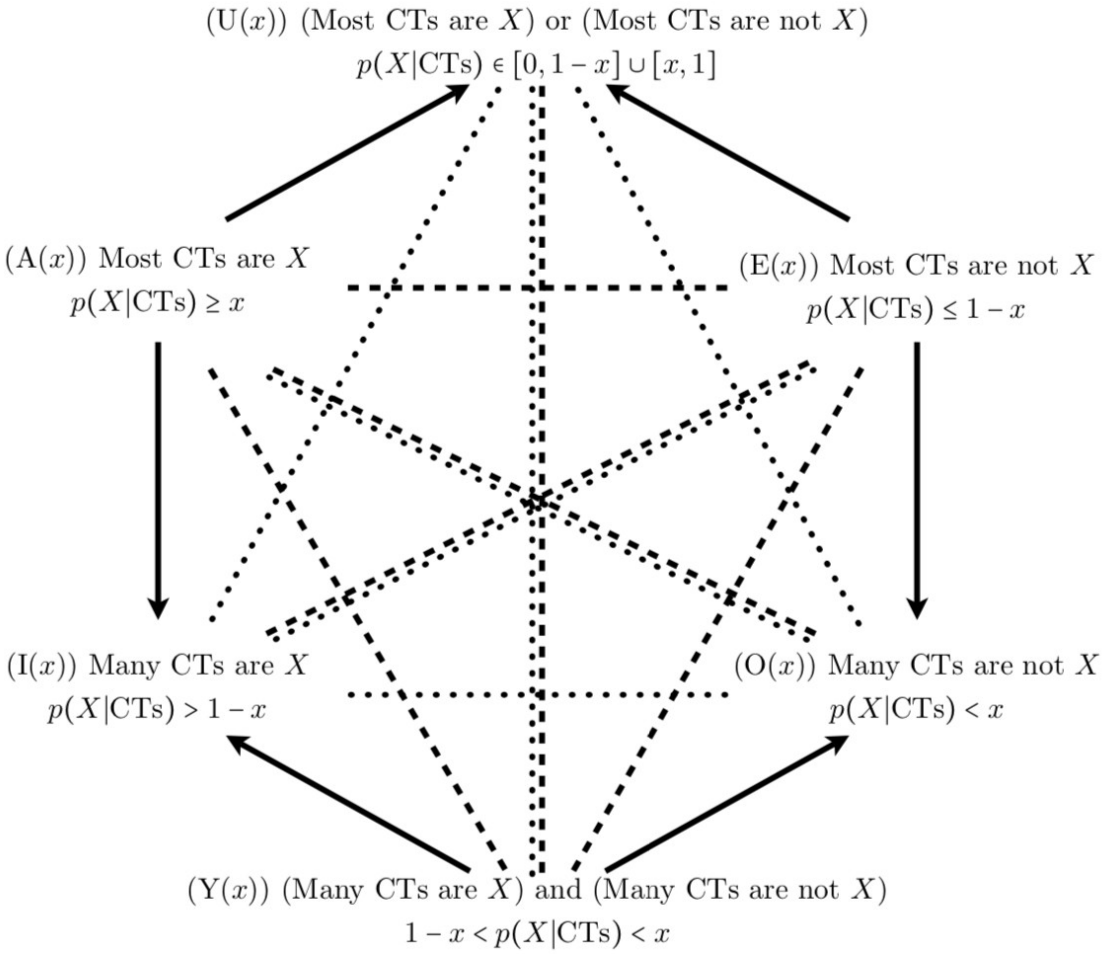

Figure 3: Generalised probabilistic hexagon of opposition on claims about conspiracy theories (CT) with generalized quantifiers based on a threshold x, where $0.5 < x \leq 1$. Hexagons involving other quantifiers (like 'Almost all' or 'Few') can be constructed by adjusting x. See also the captions of Figures 1 and 2.

4 Under frequency-based semantics, e.g., Peters and Westerståhl argue in a similar vein: 'How many *S*s must be *P* in order for *Most Ss are P* to be true? Sometimes any number more than half seems enough, but other times a larger percentage is required' (2006, 44 Footnote 33).

Figure 3 presents the *generalised probabilistic hexagon of opposition* instantiable with claims involving generalised quantifiers. The quantifiers *Most* and *Many* are used as examples (see, e.g., Peterson 2000, 25) and can, by choosing appropriate thresholds, replaced by other quantifiers like *Almost-all* or *Few*. As Sanfilippo and I (2017) proved, all logical relations among the six claims which hold in the hexagon with traditional quantifiers also hold in the (generalised) hexagon with generalised quantifiers. If the threshold x is instantiated by the value 1, the generalised probabilistic hexagon coincides with the probabilistic hexagon with traditional quantifiers.

In everyday life conversations it is often the case that when we utter 'all' and 'every', we actually do not mean strictly universal claims. For instance, stereotypical claims like 'All Italians like pizza' may not considered to be false, even when the utterer is faced with some Italians who do not like pizza. Thus, it could very well be that some CT theorists, who identify themselves as generalists, actually mean by 'Every CT is *prima facie* false' something weaker like 'Almost-all (or most) CTs are *prima facie* false'. If this is the case, again the corners (A(x)), (E(x)), and (U(x)) in the upper half of the generalised probabilistic hexagon refer to (weak) generalist positions. The lower corners, (I(x)), (O(x)), and (Y(x)) refer to particularist positions. Strictly speaking, however, all corners of the hexagon in Figure 3 refer to particularist positions.

As an example for a position located at corner (A(x)), consider Lipton's claim that 'some conspiracy theories […] may have considerable explanatory power. If only it were true, it would provide a very good explanation. […] At the same time, such an explanation may be very unlikely, accepted only by those whose ability to weigh evidence has been compromised by paranoia' (2004, 60). Another example is given by Harris[5] who claims that 'But, contra recent trends toward a more charitable attitude toward conspiracy theorising, there are epistemic errors heavily implicated in conspiracy theorising. I do not mean to suggest that all conspiracy theorists commit the sort of errors described in the preceding sections' (2018, 257). The first sentence seems to suggest a generalist position of type (A), but the subsequent sentence clarifies that Harris' position is to be located at the (A(x)) corner of the generalised hexagon.

Cassam (2016) argues that beliefs in CTs stem from intellectual vices. His 'account of intellectual character traits as habits or styles of thought or inquiry is very much in keeping with the finding that conspiracist ideation is underpinned by a distinctive thinking style, and what is a general propensity to subscribe to conspiracy theories if not a character trait?' (2016, 172). As character traits do not manifest themselves in a strictly universal manner but *mostly* or *by default*, Cassam's position can be interpreted by claims of type (A(x)), like 'Most CTs are believed because of epistemic vices'. Moreover, Cassam submits 'Conspiracy Theories are harmful' (2019,

[5] Harris (2018, 250) claims that '*modus tollens* does not have a parallel legitimate probabilistic counterpart' like modus ponens. Let me correct this statement. Like modus ponens, modus tollens *has* a probabilistic counterpart: the premise probabilities of modus tollens (e.g., $p(\neg E_2) = 1$ and $p(E_2 \mid E_1) = 1$) constrain its conclusion probability (in this case: $p(\neg E_1) = 1$). Maybe Harris had *contraposition* in mind, since its unrestricted form is probabilistically non-informative: for any $p(E_2 \mid E_1)$, this premise implies only the (non-informative) unit interval for the conclusion $p(\neg E_1 \mid \neg E_2)$; i.e., even in the extreme case when $p(E_2 \mid E_1) = 1$, only $0 \leq p(\neg E_1 \mid \neg E_2) \leq 1$ can be inferred. Hence contraposition is probabilistically invalid while modus tollens is indeed probabilistically valid (see, e.g., Pfeifer and Kleiter 2009, Table 2, and Pfeifer 2014, 854, for common confusions between modus tollens and contraposition).

125) as the take-home message of his book, which can be interpreted either as a stronger claim of type (A) or as a weaker claim of type (A(*x*)).[6]

Another instance of positions occupying corner (A(*x*)) is given by Sunstein and Vermeule. They claim on the one hand that ‘conspiracy theories are a subset of the larger category of false beliefs’ and on the other hand that ‘some conspiracy theories have turned out to be true, and under our definition, they do not cease to be conspiracy theories for that reason’ (2009, 206). If ‘virtually every’ is understood as ‘almost-all’, then Barkun’s often cited claim is also located at the (A(*x*)) corner of the hexagon, namely that there are ‘three principles found in virtually every conspiracy theory: Nothing happens by accident. […] Nothing is as it seems. […] Everything is connected’ (2013, 3f).

Psychological research on CTs typically aims to investigate why people believe in CTs. Van Prooijen, for example, aims to investigate ‘general psychological domains of cognitive complexity, experiences of control, self-esteem, and social standing [… and] how these general psychological domains are theoretically and empirically related to education, and why they are *likely* to predict belief in conspiracy theories (2017, 50, my emphasis). The qualifier ‘likely’ seems to indicate that van Prooijen does not want to make a strictly universal claim here. Rather, his research focus appears to be motivated by an underlying claim of type (A(*x*)), like ‘Most beliefs in CTs are explainable by psychological factors’. In their literature review on what psychological, political, and social factors impact people’s beliefs in CTs, Douglas et al. mention that ‘conspiracy theories have been predominantly linked to harmful social, health, and

6 Thanks to Matthew Shields, who pointed me to the fact that Cassam abandoned his 2016 generalist view—that beliefs in conspiracy theories are the result of intellectual vice—in favour of his 2019 version of generalism, where he now claims that conspiracy theories are forms of political propaganda and therefore have various epistemic flaws.

political consequences' (2019, 17) and conclude that 'conspiracy theories do more harm than good' (Douglas et al. 2019, 3), which can be classified as a claim of type (A(x)): 'Most CTs do harm'.

Grimes is a proponent of the (I(x)) corner of the hexagon, as he explicitly uses the generalised quantifier 'Many': 'Conspiratorial ideation is the tendency of individuals to believe that events and power relations are secretly manipulated by certain clandestine groups and organisations. *Many* of these ostensibly explanatory conjectures are non-falsifiable, lacking in evidence or demonstrably false, yet public acceptance remains high' (2016, 1; my emphasis).

Like the (E) corner, the (E(x)) corner might be empty. Thus, let us turn to claims of type (Y(x)).

Pigden, for example, remarks that '[t]here are, of course, plenty of conspiracy theories that it is vicious to believe, theories so far−fetched, absurd, or unlikely that you cannot believe them without exhibiting some kind of intellectual vice' (2017, 121). He also asks '[a]re conspiracy theorists epistemically vicious? Not necessarily, not always, and maybe not even usually' (Pigden 2017, 131). Bringing both quotes together, may allow for interpreting them as the conjunction of 'Many CTs are epistemically vicious' and 'Many CTs are epistemically not vicious', which is an instance of claim (Y(x)).

Concluding remarks

I presented a conceptual framework for classifying theories of CTs by a probabilistic version of the hexagon of opposition, which emerged in the spirit of probabilistic approaches in philosophy and psychology, specifically in formal epistemology (e.g., Hendricks 2006) and in the new paradigm psychology of reasoning (e.g., Pfeifer and Douven 2014). The proposed framework allows for classifying various particularist and generalist positions concerning CTs and makes the logical relations among the respective claims explicit. It allows for expressing claims in terms of traditional and generalised quantifiers. The precise meaning of the quantifiers can be made explicit by referring to the underlying coherence-based probability semantics. I illustrated the applicability of the proposed conceptual framework by using selected claims drawn from some papers of leading CT theorists from philosophy, psychology, and the social sciences. The selection is not exhaustive, as an analysis of all existing CT theories would go beyond the scope of this paper. The conceptual framework is not only aimed to classify existing approaches but is also oriented towards authors of new theories of CTs. It may serve to make their claims clear. Specifically, I suggest that authors should ask themselves how their claims are quantified, what they imply, and in what sense they are opposed to other claims. The visualisation further aids this clarification process. It may help to prevent overlooking viable positions with respect to CTs. For instance, each of the six corners of the generalised probabilistic hexagon of oppositions can be considered as a particularist position in its own right. By adjusting different probabilistic thresholds, theoretically, infinitely many particularist positions can be generated. For practical reasons, however, it makes sense to stick with those thresholds which allow for neat linguistic labels for the quantifiers, like 'Most' or 'Almost-all'. Then, still, many different kinds of particularist positions are conceivable.[7]

I think that claims about CTs which are phrased with quantifiers like 'every' or 'no' are often not understood in the strictly universal sense and are hence not really located at the (A) and (E) corners, respectively. Rather, they should be located at the (A(x)) and the (E(x)) corners, respectively, which can be conceived as particularist positions. Therefore, my analysis supports the idea that particularism should be the default view. Moreover, recall that generalist claims located on the (A) ((E), respectively) corner logically imply particularist claims on the (I) ((O), respectively)

[7] See Dentith's other article in this same special issue for a similar argument (forthcoming b).

corner. This logical observation is another argument in favour of particularism: if you are a generalist located at the (A) corner (or one located at the (E) corner), you cannot be a generalist without implying particularist claims.

Finally, let me remark that the applicability of the basic structure of the hexagon and its probabilistic semantics also extends to other domains of investigations, beyond CTs.

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