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HOW “INTUITION” EXPLODED

JAMES ANDOW

Abstract: Recent decades have seen a surge in interest in metaphilosophy. In particular there has been an interest in philosophical methodology. Various questions have been asked about philosophical methods. Are our methods any good? Can we improve upon them? Prior to such evaluative and ameliorative concerns, however, is the matter of what methods philosophers actually use. Worryingly, our understanding of philosophical methodology is impoverished in various respects. This article considers one particular respect in which we seem to be missing an important part of the picture. While it is a received wisdom that the word “intuition” has exploded across analytic philosophy in recent decades, the article presents evidence that the explosion is apparent across a broad swathe of academia (and perhaps beyond). It notes various implications for current methodological debates about the role of intuitions in philosophy.

Keywords: analytic philosophy, descriptive methodology, intuitions, metaphilosophy, methodology, philosophical methodology.

1. A Received Wisdom

Goldman gives voice to a received wisdom in philosophical methodology: “As a historical matter, philosophers haven’t always described their methodology in the language of intuitions. In fact, this seems to be a fairly recent bit of usage. Jaakko Hintikka (1999) traces the philosophical use of ‘intuition’ to Chomsky’s description of linguistics’ methodology. In the history of philosophy, and even in the early years of analytic philosophy, the terminology is not to be found. . . . This is not to say that historical philosophers and earlier 20th-century philosophers did not make [appeals to intuition], they just didn’t use the term ‘intuition’ to describe them” (Goldman 2007, 2). This wisdom is that, regardless of whether the methods of analytic philosophy have changed in recent decades, the terminology has. Philosophers use words like “intuition” a lot, and they only started doing this recently.

The reason many accept this picture may owe much to Hintikka (1999), but he was not the first to make such observations. Cohen says that the sense of “intuition” as an immediate non-inferential judgement “began to prevail in the later 1940s. It then became fairly common, at least in North America, for intuitions to be explicitly invoked by philosophers” (1986,

77). Indeed, intriguingly, the history of disquiet among philosophers over “intuition,” and the frequency with which philosophers use it, seems to go back even further. In 1946, a master’s student at the University of Sheffield, Leslie Belton, wrote a dissertation entitled “The Meaning and Use of the Term ‘Intuition’” (Belton 1946). Belton says in the introduction: “No word in common use among philosophers is in more urgent need of an accepted definition than the term ‘intuition,’ and no word bears such diversity of meaning” (1946, 4). Nonetheless, although it may not involve consensus on precise dates, received wisdom has it that use of the word “intuition” has exploded in analytic philosophy.

If the received wisdom is correct, the following questions are prompted: Why has this terminological shift taken place? Is it a purely terminological shift or is it perhaps symptomatic of a shift in philosophers’ methods? Before addressing such questions, however, we need to know whether the received wisdom is correct. We need to know whether the supposed phenomenon to be explained exists. It does. As we shall see below, the proportion of philosophy articles indexed in JSTOR indulging in intuition talk has grown from around 22 percent in the decade 1900–1909 to around 54 percent in the decade 2000–2009. And so we want to know why this has happened.

If we want to know what best explains the explosion in “intuition,” then more empirical data will be helpful—that is, beyond the simple finding that use of intuition talk has grown in philosophy. Certain facts about the explosion may help us arbitrate between explanations. For instance, information about when the explosion began and whether intuition talk exploded elsewhere could be important. In what follows, I present the results of an empirical study which shows that: (a) the explosion in the use of “intuition” is far from confined to philosophy—in fact, intuition talk has been on the rise across a broad swathe of academia; and (b) nonetheless, intuition talk has grown at a greater rate within analytic philosophy in particular.

Before I report the empirical findings, however, I want to do two things by way of motivating a more careful empirical investigation into the explosion of intuition talk. First, I want to quickly canvass the various types of explanation of the explosion that have been suggested in the philosophical literature. I note that the explosion they seek to explain seems to be one that is confined to philosophy. Second, I report some suggestive evidence that casts some doubt on this picture: evidence that intuition talk has exploded in a number of other areas, suggesting that our understanding of the explosion is impoverished.

2. Explaining the Explosion

The picture that Goldman (2007) paints is that intuition talk is on the rise but that no great methodological change drives this rise. He thinks that

philosophers have always used intuitions (it isn't clear whether he thinks the rate of use has been constant). This suggests a picture on which the recent rise in intuition talk is mainly a linguistic phenomenon. Cappelen offers a similar story, suggesting that one factor contributing to the explosion in intuition talk is that philosophers have acquired "a kind of intellectual/verbal virus (or tick) that started spreading about thirty to forty years ago" (2012, 50), and that it is not motivated by any substantial shift in philosophical commitments or methodology. Cappelen notes that he has no satisfactory answer to how the "virus" was caught or why it was so infectious. But he thinks it has been influential, and particularly damaging in philosophical methodology. He thinks that intuitions play no important part in philosophy, but that "the virus helped convince those doing methodology that things called 'intuitions' play an important part in philosophical arguments" (Cappelen 2012, 50).

Others, again, think the change in philosophers' terminology is to be explained in terms of a change in their methodology—that is, it is due to an increased use of intuitions themselves. The clearest example of such a view is that of Hintikka. He takes the explanandum to be as follows: "Before the early 1960s, you could scarcely find any overt references [to intuition]. . . . After the mid-1960s, you will find intuitions playing a major role in the philosophical argumentation of virtually every article or book" (Hintikka 1999, 5). Hintikka thinks that philosophers started using intuitions in a big way in the wake of Chomsky's influential theories in linguistics. The idea is that Chomsky's theories were so successful that they were taken to "provide a methodological paradigm of what can be done in those fields where the subject matter involves the tools of human thought and cognition" (Hintikka 1999, 5), and philosophers' increased use of intuitions is an attempt to replicate that success in philosophy. But Hintikka doesn't think that philosophers typically recognise this influence.

The question as to what explains philosophers' increased use of intuition talk is interesting in itself. However, it also seems that it has some potential methodological consequences. Certain types of explanation would generate novel worries about intuition-using methods. For instance, Hintikka claims that "the linguistic parentage of contemporary philosophers' intuitionist methodology . . . constitutes a strong reason to be wary of it" (1999, 5). Other explanations would draw attention to other problems. Cappelen thinks one of the main reasons that philosophers tend towards an intuitionist conception of their methods is the prevalence of intuition talk in philosophy. He thinks, however, that this is a big mistake, since the prevalence of intuition talk in philosophy is largely the result of a "verbal virus" rather than anything to do with philosophers' methods.

Let's quickly consider some other possible factors that we might think have contributed to the increased use of intuition talk (some via

increased appeal to intuitions themselves). Three are gestured at by Cappelen (2012): the emphasis on “what we would say” from either ordinary language philosophy or late Wittgenstein; Moore’s emphasis on the pre-theoretic; and Rawls’s use of “intuition.” Three more deserve consideration. First, the so-called linguistic turn may have played some role.¹ Second, a particular approach in early twentieth-century philosophy of mathematics and the language used in describing it may have played a role. The approach in question is that of finding formal definitions with which to replace informal and vague intuitive notions.² And, third, that the uses of “intuition” in various parts of psychology, in the 1970s and 1980s, may have contributed to the explosion perhaps having come to philosophy through Stich (e.g., 1990), among others.³

As noted, all these suggestions seem to take the explanandum to be an explosion that was confined to philosophy.⁴ However, the supposed picture doesn’t fit well with some suggestive evidence from elsewhere.

3. Suggestive Evidence

In light of the various explanations offered by philosophers, it is interesting to note that academics in some other fields have also explicitly noted an increased use of intuition talk over recent decades.⁵ In relation to economics, Frantz notes: “The increasing reliance on formal modeling and mathematics in economics after World War 2 kept intuition in the background of the profession. Yet, recently it has become almost

¹ Thanks to Jonathan Tallant for this suggestion.

² Thanks to Greg Currie for this suggestion. For an example of this sort of move, see discussion of Church’s thesis. One description of Church’s thesis that brings out this theme can be found in Shapiro 2006.

³ The particular uses I have in mind are those of Kahneman, Tversky, and colleagues (see Kahneman, Slovic, and Tversky 1982; Kahneman and Tversky 1973; Kahneman and Tversky 1982; Thagard and Nisbett 1983; Tversky and Kahneman 1981). This usage may have been influential especially in those parts of philosophy closest to cognitive science, including experimental philosophy.

⁴ Of course, some of the factors appealed to would be capable of explaining changes outside philosophy. Chomsky should be expected to have influenced linguistics. The philosophy of mathematics may have influenced mathematics. Tversky, Kahneman, and colleagues were working in psychology. Changes in these other fields, however, are clearly not considered part of the explanandum by those offering the respective explanations.

⁵ When presenting these results in a number of places, various audience members have confirmed that they are aware of this trend in their fields. Among the more unexpected include an anecdotal observation that the use of the word “intuition” has increased among horse trainers—the suspicion being that this is a result of the increased respectability of “natural horsemanship” in the past twenty years.

commonplace for an economist to state during a presentation that, 'The intuition behind the model (and/or result) is'" (Frantz 2004, 135).⁶

Haidt and Kesebir (2007) look at the use of the word "intuition" in psychology from 1985 to 2004. They find some evidence suggestive of growth. Notably, they present their findings as contrasting considerably with those of a similar previous study (Bastick 1982) that showed extremely limited use of "intuition" in psychology (in 1979). Haidt and Kesebir's main concern is intuition, rather than "intuition," but their data speak to both. Haidt and Kesebir's analysis categorises (non-incident) uses of "intuition" in research article titles into four groups. Two of these groups increased as a proportion of the total number of articles published per decade between the decades 1985–1994 and 1995–2004. Uses in one category grew by 188 percent.⁷ Uses in a second category grew by 138 percent.⁸ The base rate, that is, growth of the total number of articles, was 49 percent. Two other uses grew at and below the base rate, respectively.⁹

Tallant (2013) conducted a survey of the use of "intuition" in physics journals. His figures show that between 2001 and 2011 the proportion of papers using the words "intuition," "intuitive," "intuitively," "counter-intuitive," and "counter-intuitively" in five physics journals steadily increased, from 7.44 percent to 9.25 percent.¹⁰ Further searches on my part reveal that, in the same journals, the proportion rose steadily from 1.95 percent in the 1960s to 7.89 percent in the 2000s.¹¹

And, finally, there is some evidence from outside the academy. First, a brief search of Google's NGram corpus (containing around 4 percent of all books ever published) reveals a notable increase (about fourfold) in use of such terms between 1800 and 2000 (see figure 1).¹² The pattern also

⁶ Thanks to Jonathan Tallant for pointing me to this source. This locution is one novel to me and, interestingly, implies that Frantz has observed some increase in methodological use of intuitions. I think more detailed qualitative work would be valuable in comparing the trends in usage across different disciplines.

⁷ These were labelled "personality facts" and concern a distinction between intuitive/experiential and analytical/rational thinking styles. Haidt and Kesebir attribute the growth of this category to the work of Epstein (citing Epstein 1990).

⁸ Haidt and Kesebir label this category "anthropocentric facts." It seems to concern intuitions about aesthetic matters. This growth use is claimed to be due to increased use in social psychology.

⁹ These were "plain facts," to do with things like maths problems, and "behavioural," to do with decision making and problem solving.

¹⁰ The five journals are the following: *Physical Review Letters*, *Review of Modern Physics*, *Physical Review A-E*, and *Physical Review Special Topics Energy Beams*.

¹¹ I used the same search engine as Tallant. This can be found at <http://publish.aps.org/search> (including only papers written in English).

¹² See Michel et al. 2011 for more on this resource. Simple search tool available at: <http://books.google.com/ngrams>. This particular search was conducted on 19 May 2012. This search conducted 2 August 2013 using python script, available at <http://www.culturomics.org/Resources/get-ngrams>.

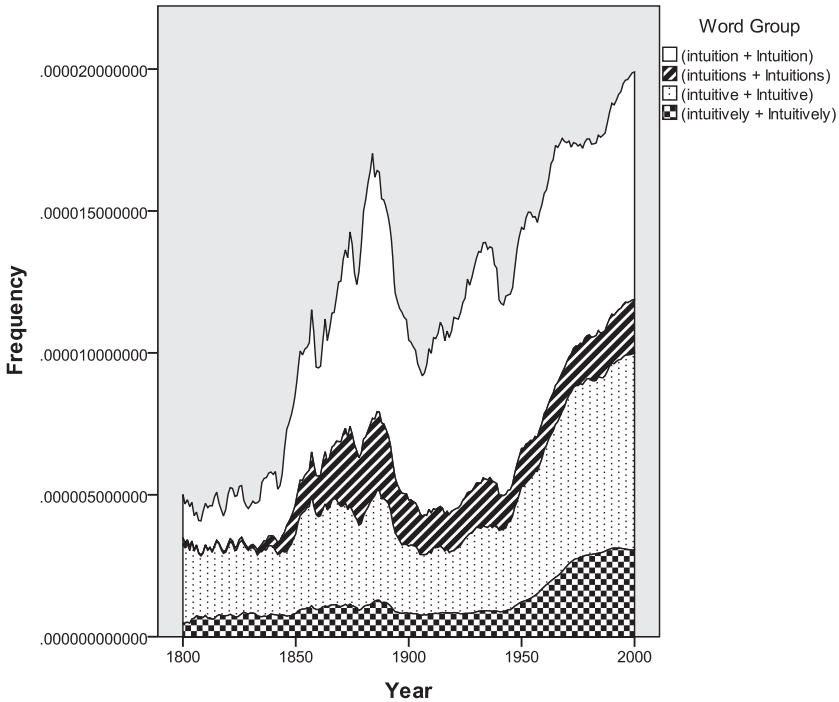


FIGURE 1. Intuition talk in Google's NGram corpus.

remains if we restrict ourselves to English fiction writing. I searched for "intuition" and "intuitive" in the period 1800 to 2000. In this period in fiction the frequency of "intuition" and the frequency of "intuitive" each rose from around 1.5 to 5 tokens per million words.¹³

Second, a brief search of the *TIME* corpus that contains all copies of *TIME* magazine from 1923 to 2006 reveals a similar pattern.¹⁴ During the period 1923–1929, the frequency of "intuition," and so on, was 2.62 tokens per million words. During 2000–2006, the frequency was 8.4 per million. The general pattern between 1923 and 2006 is one of increase, although the pattern is not one of steady increase.

¹³ These are rough figures based upon Google's NGram Viewer output graph. This particular search was conducted on 19 May 2012.

¹⁴ The corpus was created by Mark Davis at Brigham Young University. The search facility is available at <http://corpus.byu.edu/time/>. The search for these data was conducted on 28 October 2013. The search terms were the following: "intuition," "intuitions," "intuit," "intuits," "intuitive," and "intuitively." Thanks to Millar (2009) for drawing my attention to this resource.

The pattern *suggested* by these various observations is not that the rise in intuition talk in philosophy is an isolated phenomenon. Rather, the pattern *suggested* is that intuition talk is on the rise rather more generally—perhaps even across the board. And if this is so, the canvassed suggestions (in section 2) as to what explains the explosion in philosophy seem likely to explain at most part of the phenomenon. In any case, the evidence just surveyed serves to demonstrate that our understanding of the nature of the explosion in intuition talk in philosophy is impoverished. It seems that if we want to understand why intuition talk exploded in philosophy, we need to find out more about how the explosion in philosophy relates to any more general explosion. In the rest of the article, I present evidence that strongly suggests that the growth of intuition talk in philosophy is part of more general phenomenon. This suggests that the most important explanatory factors—which explain the explosion in philosophy—are likely to be factors that are not specific to philosophy.

4. Study

A first step is to confirm whether intuition talk has indeed exploded in philosophy and elsewhere; so we need data.

There is an unfortunate lack of resources to turn to in order to gain such data. Corpora that allow for diachronic study of word frequencies in English, more generally, over the twentieth century are scarce and very small compared with corpora used for other purposes.¹⁵ This is a problem for diachronic studies looking at English usage in general, let alone for studies that require looking particularly at academic writing and comparing different disciplines.¹⁶ Consequently, the method used in the present study has had to be a little less direct, and inventive.

4.1. Method

I searched for the terms “intuit,” “intuition,” “intuitive,” “intuitions,” “counter-intuitive,” “intuitively,” and “counter-intuitively” in all journal research articles published in English available through the JSTOR database.¹⁷ Using JSTOR, it is possible to ascertain both the number of articles

¹⁵ See Millar 2009 for an extended discussion of the lack of appropriate resources. Millar recommends the use of the *TIME* corpus for diachronic studies. However, this is of no use for my purposes here.

¹⁶ See Groom 2005 for a study which uses corpora that allow for the comparison of two disciplines—History and Literary Criticism—but not diachronic study.

¹⁷ This can be found at <http://dfr.jstor.org>. JSTOR coverage for the decade 2000–2009 is not complete for all journals. However, since (i) we are working with proportions, and (ii) no large changes in trends are observed relating to this decade, I think that it is safe to use the data from this decade. The physical sciences are not well represented in JSTOR, so their absence here ought not to be taken to indicate a lack of growth in the use of “intuition” in the physical sciences.

published in each discipline in each decade and the number of articles mentioning one of the search terms, and thus to calculate the proportion of articles published during each decade by disciplines that mention the search terms.

There are limitations to the data which are worth noting to avoid confusion. For instance, the search facility used doesn't give us manageable data concerning actual word frequencies, and it doesn't allow us to easily distinguish between different ways of using the same words. Qualitative research looking at rather smaller samples of text would be necessary to make such distinctions. We should also bear in mind that JSTOR is not a *perfect* resource, in that not every journal is indexed. Nonetheless, it does provide a fairly general coverage of academic publishing and a search facility that gives useful information—a feature not shared by any obvious alternatives. Other multidisciplinary indexing or search services that I considered (for example, Pubget, Google Scholar, and Springer) do not enable easy access to information that would allow one to track both the number of articles indulging in intuition talk and the total number of articles published by discipline in a given time period.

The headline finding is that I found that an increase in the proportion of articles using at least one of these terms was apparent across the broad swathe of academia indexed by JSTOR. Now for some more details.

4.2. *Basic Results*

The figures showing the rise in proportions are shown in table 1. The figures for philosophy largely confirm the commonly assumed picture: that intuition talk in philosophy has been on the rise in recent decades. The increase certainly seems to have been greatest from the 1950s onwards. Indeed, we might tentatively observe that prior to this there seems to have been a period of relatively little change in the proportion of philosophy articles engaging in intuition talk.

The explosion, however, is far from confined to philosophy. Philosophy articles are generally more likely to indulge in intuition talk—no other discipline really comes close until the 1980s—but the general pattern of increased rates of indulgence in intuition talk exists to some degree across most disciplines indexed. This can be clearly demonstrated since, even if we take data relating to philosophy articles out of the analysis, there is a significant effect of decade on the proportion of articles in a discipline mentioning the search terms per decade.¹⁸ Indeed, every decade since the 1940s saw a highly significant increase in the proportion of articles in a discipline mentioning the search terms compared with the previous

¹⁸ Using a repeated measures ANOVA with a Greenhouse-Geisser corrections, $F(1.53, 59.46) = 115.03$, $p < .0005$.

TABLE 1. Indulgence in intuition talk by decade and discipline

Table Information: The first row gives the decade-by-decade proportions (in percentages) for all disciplines, including those not exhibited. The rest of the disciplines are ranked in decreasing order by the proportion of articles mentioning the terms for the 2000s. Dashes indicate that no articles are indexed for a given discipline and decade. The searches for the data in this data set were conducted on 4 September 2012.

Discipline	1900s	10s	20s	30s	40s	50s	60s	70s	80s	90s	2000s
All disciplines	2.6	3.6	4.2	5.2	6.2	8.3	10.5	13.1	14.6	16.3	18.3
Philosophy	21.7	29.6	34.5	33.5	4.2	32.7	34.9	44.1	47.5	50.5	53.6
Finance	7.2	5	7	6	12.4	10.1	16	18.7	25.8	36.7	47
Marketing & Advertising	—	—	—	11.1	11.4	14.6	17.3	25.6	31.8	36.8	39.9
Business	7.1	6.4	6.2	6.5	10.1	13.4	16.3	20.1	25.7	32	39.3
Linguistics	3.9	5.1	4.3	5.1	5.9	5.7	15.2	22.8	24.6	32.4	39.2
Economics	6.7	6	6.1	7.1	9.9	13.2	14	16.5	21.6	27	34.5
British Studies	8.1	6.4	8.9	12	13.3	22.9	19.5	24.8	27.8	30.1	33.5
Slavic Studies	—	—	18.8	17	19.2	20.7	19.4	24.5	23.7	27.6	33.2
Management & Org. Behav.	—	—	—	—	8	18.1	21.1	19.8	23	29.2	32.9
Hist. of Science & Technology	8.8	10.9	15.9	13	12.7	17.2	21.7	30.4	31.1	33.4	32.5
Transportation Studies	—	—	—	—	—	—	13.4	18.4	21.7	26.6	32.2
Law	2	2.9	3.7	6.8	7.8	9.5	14.7	19.1	24.8	27.2	30.8
Religion	5	8.3	7.2	9.4	10.5	13.5	16.3	21.7	24	25.3	28.3
Sociology	8	6.9	7.3	8.8	9.5	11.7	14.7	20.2	21.5	25.2	27.9
Latin American Studies	—	7.8	5	7.2	8.5	11	15	20.5	21.7	24.6	27.9
Political Science	5	5.8	7.8	12.6	13.2	16.2	17.4	18.7	20.8	22	27
Statistics	3.3	2.5	3.6	5.1	8.6	13.2	14.5	15.5	17.2	22	26.6
African Studies	3.4	4.7	4.7	7.1	5.5	6.1	9.9	15.9	19	22.5	26.2
Public Policy & Admin.	—	2.9	2.7	4.3	6.4	10	13.7	19.3	22.1	24.2	25.9
History	3.8	4.8	5.9	7.5	9.3	12.3	16.1	20	21	24.2	25.7
Development Studies	—	—	—	—	—	—	12.4	8.6	18.4	21.7	25.3
American Studies	3.6	4.6	5.8	7.2	7.5	11.2	14.3	16.4	17.5	22	24.4
Anthropology	2.7	2.9	2.9	4.6	4.9	7.2	10.9	15.8	17.3	22.1	24
Music	4.9	6.5	7.8	6.2	6.1	7.5	7.5	10	13.2	18.2	23.8
Folklore	2.5	2.1	2.7	4.4	2.8	6	6.8	11.6	16.3	17.5	23.2
Jewish Studies	6.7	7.1	5.5	9.1	13.3	12.4	12.7	16.3	20.8	24.3	22.8
Psychology	16.3	13.1	7.9	9.8	12.1	10.8	13.4	12.3	16.8	20.4	22.5
Film Studies	—	—	—	—	5	9.1	14.6	21.7	23.8	24.6	22.2
Asian Studies	3.7	3.5	3.8	6.8	7.3	14.1	14.3	14.8	16.4	19.3	22
Middle East Studies	2.1	3.7	4	5	5.4	7.7	11.4	15.2	14.9	18.2	21.6
Architecture & Architec. Hist.	0	0	8.7	8.3	6.1	10	10	10.1	15.3	18.4	20.4
Art & Art History	2	3	5.8	3.8	7.3	10.2	10.8	12.1	13.9	16.6	19.5
American Indian Studies	—	9.1	0	2.7	3.5	3.8	8.2	9.2	9.9	14.9	19.5
Performing Arts	—	—	—	—	0	11.1	15.2	16.7	12.5	16.7	19.4
Language & Literature	5.5	5.5	4.6	6	7.6	8.9	12.2	14.2	15.4	16.2	18
Education	4.5	4.1	3.5	4	4.3	5.7	9.4	11.9	13.2	15.5	17.7
Feminist & Women's Studies	—	—	—	—	—	—	—	6.6	8.8	12.6	17
Bibliography	—	—	2.6	8.9	9	9.1	9.9	11.9	14	17.2	16.8
Geography	1.8	2.6	2.4	2.5	2.9	5.3	7.3	11	11	12.7	16.6
Classical Studies	3.3	3.7	3.8	4.7	6.1	7.6	9.4	10.4	11.7	15.4	16.6
Population Studies	—	—	—	0	7.2	9.3	8.1	9.2	11.8	14.1	16.3
Mathematics	2.2	3.5	5	6.5	7.4	8.7	8.6	9.3	10.8	12.7	15.5
African American Studies	—	0	5.1	6.7	8.6	8.7	8.9	12.6	12.5	12.4	13.1
Archaeology	2.4	3	3.1	3.9	4.1	4.8	5.7	8	8.5	9.9	11.6
Ecology & Evolutionary Biol.	1.1	1.5	1.4	2.1	1.9	3.2	5	8.1	8.5	9.7	11.2
Irish Studies	2.1	3.9	4.2	6.2	5.9	8	8.5	9.7	10.9	9	10.8
Health Policy	0	0.5	0.3	0.7	0.9	2.7	6.2	8.6	10	8.6	9
Aquatic Science	—	1.9	2.8	2.8	2.9	4.2	5.6	7	8	8.4	8.6
Biological Science	1.2	1.8	2	2.6	2.7	4.4	6.7	7.9	7.8	7.6	8
General Science	2.1	2.8	2.7	3.6	4.2	7	8.7	9	7.7	7	7.6
Library Science	5.4	5	5	3.6	2.5	4.3	5.8	6	6.9	7.3	7.4
Developmental & Cell Biology	—	—	—	—	—	2.5	9.3	16.9	19.5	14.2	6.7
Astronomy	1.2	0.8	0.6	1	0.7	0.6	1.4	3.9	5.6	7.6	6.4
Zoology	0.6	0.9	0.8	0.8	0.8	1.3	2.1	3.6	5.5	6.1	6.1
Paleontology	1.6	0.6	1	1.9	1.8	3.7	4	4.5	5.4	6.2	5.9
Health Science	1.6	1.9	1.6	1.4	1.6	1.8	1.9	2.8	4.1	5.1	5.9
Botany & Plant Science	0.5	0.7	1	1.4	1.7	3	6	6.5	5.5	5	5.2

decade.¹⁹ This suggests clearly that the explosion in use of “intuition” and related words is not confined to philosophy.

4.3. Comparing Philosophy and Non-philosophy

Having confirmed that there has been a very general increase in the rate of indulgence in intuition talk, we can now ask whether the explosion in intuition talk in philosophy has nonetheless been greater than in other disciplines.

We can use binary logistic regression analysis to see if we can predict whether an article mentions one of the search terms using the variables (i) decade, (ii) whether an article was published in philosophy or elsewhere, and (iii) the interaction of (i) and (ii).²⁰ If the interaction term were significant, this could be a good sign that the rate of growth in philosophy was different from that in other disciplines. Table 2 shows the various regression coefficients and Wald statistics. All are highly significant (at .01 levels).

Although the interaction is significant, we should note that the regression coefficient is small and, anyway, negative. This means that the model predicts that the extent to which the proportion of philosophy papers engaging in intuition talk exceeds the proportion of other papers that engage in such talk falls over time. To get a better idea of the nature of this interaction, we can consider some figures called odds ratios.²¹ We can ask

TABLE 2. Model 1

Model	B	Wald χ^2	p
Philosophy	2.233	9347.372	< 0.0005
Decade by philosophy	-.062	450.758	< 0.0005
Decade	.165	12817.243	< 0.0005
Constant	-2.324	40517.458	< 0.0005

¹⁹ Details from post hoc tests using Bonferroni correction (asterisks indicate highly significant increase on previous decade): 1900s, $m = 3.85$, $SD = .49$; 1910s, $m = 4.12$, $SD = .44$ ($p = 1$); 1920s, $m = 4.65$, $SD = .47$ ($p = 1$); 1930s, $m = 5.63$, $SD = .50$ ($p = .009$)*; 1940s, $m = 6.46$, $SD = .61$ ($p = .16$); 1950s, $m = 8.58$, $SD = .76$ ($p < .0005$)*; 1960s, $m = 10.68$, $SD = .78$ ($p < .0005$)*; 1970s, $m = 13.35$, $SD = .99$ ($p < .0005$)*; 1980s, $m = 15.40$, $SD = 1.13$ ($p < .0005$)*; 1990s, $m = 17.97$, $SD = 1.39$ ($p < .0005$)*; 2000s, $m = 20.55$, $SD = 1.67$ ($p < .0005$)*.

²⁰ Decade was coded 0 to 10. Place of publication was coded philosophy .5, non-philosophy -.5. A test of this model compared with a model containing only a constant (the intercept) was statistically significant, $\chi^2(3, 5280019) = 178227.617$, $p < 0.0005$. The model correctly classified 2.9 percent of those papers that mentioned the search terms and 99.6 percent of those that did not.

²¹ Because the interaction term is in the model we cannot read odds ratios straightforwardly from the regression coefficients.

what the model predicts about the odds that a philosophy paper engages in intuition talk for each decade surveyed.²² We can also ask what the model predicts about the odds that any other paper does the same. And we can then compare these odds by asking in what ratio they stand to each other—I call this the expected odds ratio.

The expected odds ratios are displayed in table 3. The expected odds ratios steadily *decrease* over time, that is, they show the extent to which (i) the odds that a philosophy paper engages in intuition talk exceed (ii) the odds that a non-philosophy paper will do the same, steadily decreasing over the surveyed period.

We can also calculate what we might call the observed odds ratios directly from the data. This reveals a similar story (see table 4): there is a general downward trend. The observed odds ratios do suggest, however, that if we want to properly understand the interaction it may be worth treating the periods 1900–1950 and 1950–2009 separately. The reason for this is that since the 1950s the odds that a paper published in philosophy engages in intuition talk have been (roughly) a steady five times the odds that a paper outside philosophy would do the same. This suggests that we should perhaps be treating the two periods (before and after 1950) as exhibiting different trends. That the trends are different for the first and second halves of the twentieth century is also suggested by the finding that only since the 1940s have non-philosophical disciplines consistently seen a highly significant decade-on-decade rise in the proportion of articles mentioning the search terms (see table 1).

TABLE 3. Expected odds ratios

Decade	Odds ratio	95% confidence intervals	
		Upper	Lower
1900	9.33	9.45	9.21
1910	8.77	8.87	8.67
1920	8.24	8.33	8.15
1930	7.74	7.82	7.66
1940	7.28	7.35	7.21
1950	6.84	6.90	6.79
1960	6.43	6.48	6.38
1970	6.04	6.08	6.01
1980	5.68	5.71	5.65
1990	5.34	5.37	5.31
2000	5.02	5.05	4.99

²² The model: $\hat{Y} = -2.324 + 2.233 * \text{Phil} - .062 * \text{Phil} * \text{Decade} + .165 * \text{Decade}$.

TABLE 4. Observed odds ratios

Decade	Odds ratio	95% Confidence intervals	
		Upper	Lower
1900	11.39	12.83	10.11
1910	12.34	13.62	11.18
1920	13.10	14.38	11.94
1930	9.93	10.76	9.17
1940	8.45	9.10	7.85
1950	5.70	6.03	5.39
1960	4.75	4.99	4.53
1970	5.50	5.70	5.30
1980	5.56	5.74	5.38
1990	5.49	5.66	5.32
2000	5.43	5.58	5.28

TABLE 5. Model 2

Model	Wald	χ^2	p
Philosophy	1.606	1613.772	< 0.0005
Decade by philosophy	.010	4.595	.032
Decade	.166	4798.034	< 0.0005
Constant	-2.327	13551.247	< 0.0005

Pursuing this thought, looking just at the period after 1950, we find binary logistic regression giving the model in table 5.²³ In this model, the interaction is still less important: the interaction is significant only at the .05 level and not at the .01 level; the coefficient for the interaction is, although positive, rather smaller. This suggests the same picture: that the extent to which philosophy papers are more likely than other papers to engage in intuition talk has not undergone huge growth since the 1950s.

One way to illustrate this is to plot the data. In figure 2, we can see the proportions of articles that engage in intuition talk and the proportion of articles in all other disciplines from the 1950s to the 2000s. We can compare the line of fit for philosophy (the upper line) with a regression line for the proportions in non-philosophical disciplines (the lower line).²⁴

²³ A test of this model compared with a model containing only a constant (the intercept) was statistically significant $\chi^2(3, 4291567) = 78033.860, p < 0.0005$. The model correctly classified 3.1 percent of those papers that mentioned the search terms and 99.5 percent of those that did not.

²⁴ Philosophy line: $\hat{Y} = .443 * x - 831.14$. Non-philosophy regression line: adj. r-squared .242, $\hat{Y} = .24 * x - 459.18$.

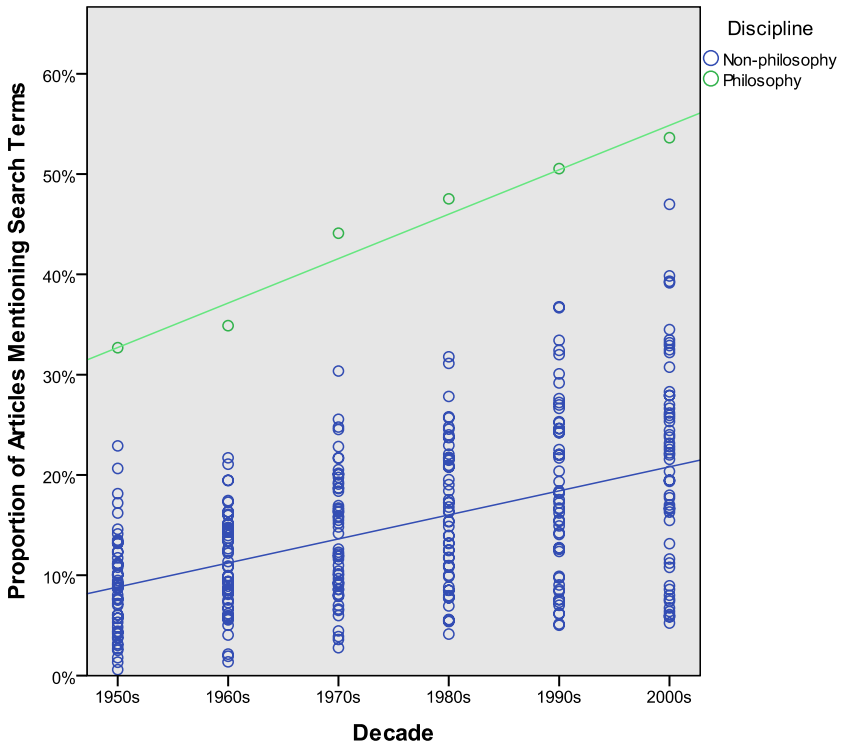


FIGURE 2. Proportion of articles mentioning “intuition,” by decade.

It is clear that the rates of increase are in the same ballpark (even though the actual proportions are generally much higher in philosophy). Interestingly, although it may look as if the rate of increase in philosophy is marginally greater, we should note that fixed increases, for example, of 10 percent, on the y-axis do not represent the same absolute rate of growth because such an increase, of 10 percent on the y-axis, represents percentage change in proportion. To illustrate, the increase from approximately 40 percent to 50 percent in philosophy between the 1970s and 2000s for instance doesn't indicate as large a rate of increase as an increase over the same period from 10 percent to 20 percent—the former representing a 25 percent increase in proportion and the latter a 100 percent increase. Looking instead at the relative decade-on-decade increase in proportion gives a more accurate picture. In this second graph (figure 3), which plots increase in proportion relative to previous decade by decade, the lower line is a line of fit for the proportion of philosophy articles mentioning the

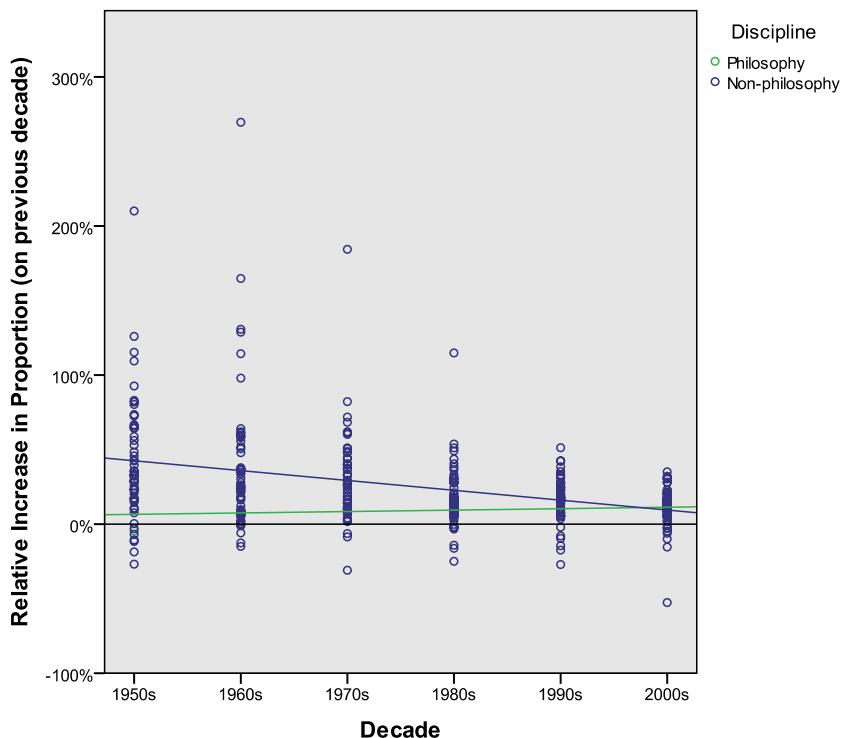


FIGURE 3. Relative decade-on-decade increase in percentage.

terms in each decade from the 1950s onwards.²⁵ The upper line is a regression line for the proportion of non-philosophy articles mentioning the terms in each decade from the 1950s onwards.²⁶

The emerging picture is that the rate of increase in intuition talk in non-philosophical disciplines has been rather higher than in philosophy, but that it has been decreasing over the period whereas the rate of increase in philosophy has remained relatively constant.

4.4. Comparing Analytic and Other Philosophy

One remaining hypothesis is that the explosion in analytic philosophy has nonetheless been rather larger than in non-philosophical disciplines. The numbers for philosophy from JSTOR given above lump analytic and

²⁵ $\hat{Y} = .096 * x - 180.694$

²⁶ Adj. r-squared .115, $\hat{Y} = -.66 * x + 1329.483$

continental philosophy together. One reason this failure to differentiate is relevant is that within continental articles discussion of figures such as Kant, Bergson, Husserl, and so on, seems likely to have been common right from the beginning. The word "intuition" plays a large role in discussion of the work of these figures (in ways that are somewhat removed from those common in contemporary analytic philosophy).

One way to try to probe this further is to compare the proportions of articles engaging in intuition talk within publications that we can identify as "staunchly analytic" to the proportions for articles published elsewhere. Table 6 records the proportion of articles engaging in intuition talk in *Philosophical Review* and *Mind* and compares them to the figures for the rest of philosophy.²⁷ (*Philosophical Review* and *Mind* were ranked first and fourth in quality among general philosophy journals in recent years in an important ranking by analytic philosophers.²⁸ The second and third places were taken by *Noûs* and the *Journal of Philosophy*. I don't include the data for the *Journal of Philosophy* here, as a name change makes tracking the proportions difficult. I have left *Noûs* out because it is a fairly recent journal, having published its first issue in 1967.)²⁹

There is a clear difference in the scale of the explosion between *Philosophical Review* and *Mind* and the rest of philosophy. Figure 4 shows clearly the trend of staunchly analytic publications to have a greater rate of growth in the *proportion* of articles using "intuition" and similar terms from the 1950s onwards.

Table 7 allows us to compare *Mind* and *Philosophical Review* to all other journals (in all disciplines). We can see that the difference is quite stark. The odds that a *Mind* or *Philosophical Review* paper published in the period 2000–2009 engages in intuition talk are roughly twelve times the odds that a paper published elsewhere will do so! (And, again, we can see

TABLE 6. Proportions per decade in philosophy journals

Journal(s)	1900s	10s	20s	30s	40s	50s	60s	70s	80s	90s	2000s
Other	17.3	25.3	34.3	32.1	33.2	33.4	35.6	44.4	47.3	50	53.3
<i>Mind</i>	32.5	37.1	30.6	31.2	34.5	25.9	27.4	36.2	49.6	66.5	67.2
<i>Phil. Rev.</i>	29.5	43.7	40.6	44.7	42.7	31.2	33.5	53.6	63.3	73.3	86

²⁷ The searches for the data in table 6 were conducted on 4 September 2012.

²⁸ The report for 2009 can be found at <http://leiterreports.typepad.com/blog/2009/03/the-highest-quality-general-philosophy-journals-in-english.html>. The report for 2012 can be found at <http://leiterreports.typepad.com/blog/2012/04/the-top-20-general-philosophy-journals.html>.

²⁹ Nonetheless, in that short time the proportion of articles mentioning the relevant terms in *Noûs* has risen, demonstrating a spectacular increase, from 46.7 percent (1967–1976) to 83.9 percent (2000s).

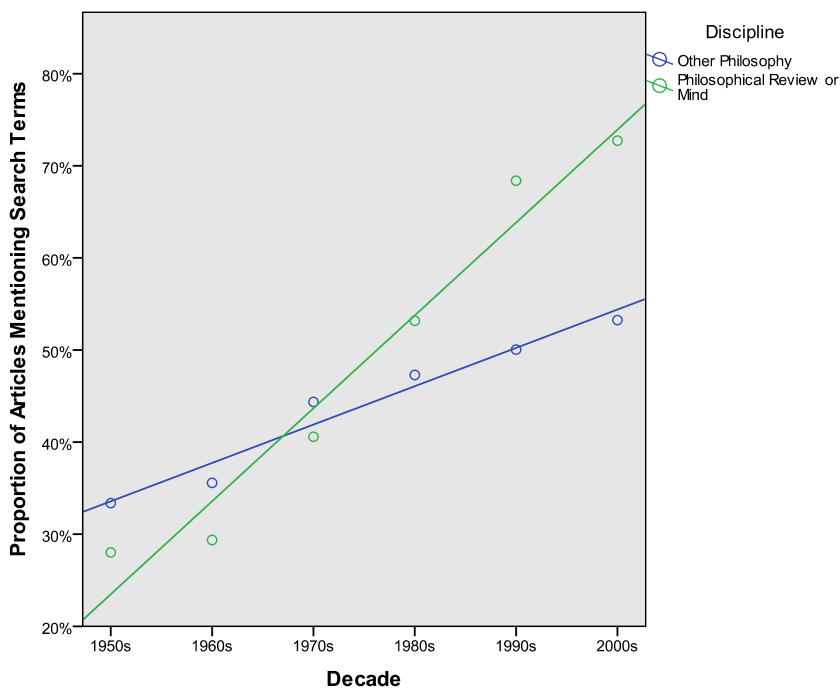


FIGURE 4. Proportion of philosophy articles mentioning search terms.

TABLE 7. Odds Ratios: *Mind* and *Phil. Review* vs. everywhere else

Decade	Odds ratio	95% confidence intervals	
		Upper	Lower
1900s	17.73	21.34	14.73
1910s	18.42	21.74	15.61
1920s	12.56	14.84	10.63
1930s	11.48	13.42	9.82
1940s	9.91	11.69	8.40
1950s	4.33	5.08	3.69
1960s	3.55	4.11	3.06
1970s	4.54	5.22	3.95
1980s	6.65	7.81	5.67
1990s	11.11	13.51	9.14
2000s	11.95	14.96	9.55

a pattern of increasing ratios since the middle of the twentieth century.) To sum up this section, it does seem that, even if *philosophy generally* has not seen a markedly larger explosion, *Mind* and *Philosophical Review*, and by inference *analytic philosophy*, have. In the 2000s, 86 percent of articles in *Philosophical Review* engaged in intuition talk, which suggests that some discipline-specific explanations will have some role to play in explaining the explosion in intuition. It also seems that any analytic-philosophy-specific contribution to the recent explosion has played an important role only since 1950.

5. Conclusion

The lessons that we should take from this study are fairly modest. Further empirical work will be required in order to make any concrete claims about what the causes of the explosion in intuition talk have been, both in philosophy and elsewhere. Nonetheless, I think that there are three important lessons to be learned. The basic shape of the three lessons is as follows. We now have a better understanding of the phenomenon to be explained—the explanandum. What we have learned about the explanandum allows us to place restrictions on what a satisfactory explanation of the explosion would look like—upon the explanans. Let me say something about the lessons to be learned before moving on to note some limitations of the present study and some promising avenues for future research.

Lesson number one is that the received wisdom is largely borne out by this study. Analytic philosophy does seem to have seen a large surge in intuition talk since the 1950s, and this surge has been greater than the increases observed both in philosophy more generally and in the rest of academia. All the same, we should note that it doesn't seem to be true that, for instance, as Goldman claims, "in the early years of analytic philosophy, the terminology is not to be found."³⁰ Indeed, in both *Mind* and *Philosophical Review* intuition talk is common *throughout* the period surveyed. So, if we want to explain the explosion in usage within philosophy in recent decades, then explanations that aim to explain some phenomenon specific to analytic philosophy—for example, many of the suggestions surveyed earlier—will doubtless have to play some *minor* role, but a minor role is the only role they will have to play. (It is, of course, *possible* that the explosion of intuition talk in philosophy is a phenomenon completely distinct from that observed in other areas of academia, for all the

³⁰ Goldman's claim is that intuition talk is not to be found in the early years of analytic philosophy *used to describe the practice of appealing to intuitions*. My data don't show this to be false. A more detailed qualitative survey would be needed to confirm whether early uses describe intuition use.

evidence presented here. The best explanation of the evidence, however, is not one that treats the appearance of a general pattern merely as a coincidence.)

Lesson number two is that we can start to refine the pool of analytic-philosophy-specific factors that are plausible candidates for this minor role. Only factors whose contribution would be made in the latter half of the twentieth century seem to be plausible explanations for the greater rate of increase in intuition talk in analytic philosophy. This is due to the fact that the greater rate of increase is clearly apparent only from the 1970s onwards (see figure 4). Looking at the suggestions I canvassed earlier, it does seem that we can make some tentative refinements of this variety. Some of the suggested factors do still look plausible: any influence of Chomsky, Rawls, intuition talk in 1970s and 80s psychology, and (to a lesser extent) Wittgenstein and ordinary language philosophy might plausibly have been during this period. On the other hand, some of the other suggestions look less plausible; any influence of Moore or early twentieth-century philosophy of mathematics seems unlikely to account for the upturn in the rate of intuition talk that begins later in the twentieth century.

Lesson number three, perhaps the most important, is that we should not underestimate the extent to which the explosion in philosophy (even analytic philosophy) is part of a wider phenomenon. The findings of the study indicate that there has been a rather large growth in intuition talk across a broad swathe of academia. It seems likely, therefore, that appeal to some more generally relevant factors will feature centrally in any complete explanation of why philosophers engage in quite as much intuition talk as they do. Perhaps Cappelen is right to attribute much of the explosion in philosophy to some sort of verbal virus (the twist is that everyone had the virus). Of course, the question remains as to why intuition talk has been increasing more generally. It seems unlikely that any more general trend is due to any great shifts in methodology. One reason I say this is that the methods employed across the different disciplines are very varied. Another is the suggestive data (in section 3) showing increases in usage outside the academy, which suggest that the upturn may not be restricted to academia at all. However, beyond suggesting that the general terminology shift is likely not due to a general methodological shift, I have no particular explanation to advance.

This said, it is worth thinking about what explanations of such a phenomenon might be like. And so I offer two suggestions, to which I have no particular commitment, simply in the spirit of illustrating the type of factors to which one might appeal to explain a more general increase in intuition talk.

First, there might be a connection with a number of studies indicating that levels of various relevant psychologically interesting characteristics have increased in recent generations, for example, positive

self-conceptions, extraversion, and narcissism.³¹ There are a number of such studies (Twenge 2001; Twenge and Campbell 2010; Twenge and Foster 2008 and 2010; Twenge et al. 2008a and 2008b).³² This could be relevant, since a society in which individuals come to have higher perceptions of their own worth and become more willing to share information about themselves might well be expected to be one in which people become more likely to talk about their personal mental states and to report their instinctive reactions—that is, one in which talking about their intuitions come to be more common. I think that it is likely factors such as these, for example, facts about changing psychological dispositions or the social acceptability of certain types of discourse (perhaps within academic contexts), are the sorts of factors we should be thinking about.

Second, one explanatory factor may be the increased fragmentation of the research community.³³ The thought might be that academic writings are targeted at a much more homogeneous audience than they once were, because people address their work to a very narrow specific corner of academia. This being so, the expectation that you will be able to appeal to intuition about x and have your audience share your intuitive response to x would be much higher. This could explain why academia as a whole saw a large increase in intuition talk.

Indeed, all sorts of things could be relevant. A third and final suggestion draws on the idea that the concept of intuition has been gendered historically, at least at times. It is possible that the increase in intuition talk in the academy has something to do with the change in the proportion of female academics. The idea might be that this led to a change in climate rather than that women use intuition talk more often. As with the other suggestions, more data are needed to properly assess this suggestion's merits. (The changing proportion of female authors in JSTOR has been examined; see West et al. 2013. The data are not, however, rich enough to provide much insight for our purposes.) As I say, these three suggestions are intended simply as an illustration of the type of factors that could generate such a shift.³⁴

So the present study makes some important contributions to our understanding of the explosion in intuition talk and helps us start to

³¹ Thanks to Ben McGorrigan for this suggestion. Levels of narcissism are measured using the Narcissistic Personality Inventory developed by Raskin and colleagues (Raskin and Hall 1979 and 1981; Raskin and Terry 1988).

³² But note that some meta-analyses question some of these findings (Donnellan, Trzesniewski, and Robins 2009; Trzesniewski, Donnellan, and Robins 2008).

³³ This was suggested by an audience member in Derby.

³⁴ Once we have a hypothesis about what might drive any more general increase—about the nature of the “virus”—it would also be worth asking whether there is any reason to think philosophers would be particularly susceptible to picking up the language as compared with writers in other disciplines (or perhaps other disciplines showing sharp rises over the same period, e.g., finance, marketing, and business).

explain why the explosion occurred. And this is not without consequence for philosophy and philosophical methodology. For one instance, it is not uncommon to premise the urgency of the methodological investigation of intuitions on linguistic facts (like Hintikka 1999). The thought might be “it seems almost every philosophy paper written in the past ten years makes explicit appeal to intuition,” and one might proceed to worry about the changing methods or assumptions undergirding this linguistic change. The findings of the present study show, however, that generating methodological worries about intuitions in this way is problematic. Philosophers do use the word “intuition” a lot nowadays, but the evidence suggests that this is not due to any great shift in methods, so there is no particular reason to start worrying and asking, What is this new method? Is it reliable? And so on. (Of course, none of this is to say that we shouldn’t be worried about philosophers’ use of intuitions, just that, if we are going to be worried, we should be worried for better reasons.)

The present study only goes so far. Further research, particularly qualitative research, will be essential in order to get a clearer picture. Gathering and analysing such data will be a big project requiring time and resources. It will, however, help us address a number of questions that the present study has a limited ability to address. I’ll finish by noting a few of these questions. Answering these questions will not only help us pinpoint the explanation for the explosion but also provide an invaluable source of insight into the methods of philosophers and other academics, including to what extent philosophers’ methods are distinctive to philosophy.

(1) *How has the actual frequency of words such as “intuition” and “intuitively” changed in academia over the surveyed period?* We can’t make any direct inferences about word frequency from the present study, since we have no information about article length or the number of “intuition” tokens in each article. An increase in the proportion of articles using intuition talk—such as I observe—could *theoretically* be explained by an increase in the length of academic articles (if, indeed, any such increase in length has occurred).³⁵ While it is possible to obtain data concerning word frequencies from the same JSTOR Data for Research facility used for the present study, to organise this data into a form we could use to address this issue here would have been too laborious (for a single researcher with limited time), as it is provided in files that contain the word-frequency

³⁵ Thanks to Tom Stafford for making this point clear. But note that it is implausible that the length of research articles has increased to an extent that would provide a complete explanation. In the 1900s, the proportion of articles using intuition talk across all disciplines was 2.6 percent and in the 2000s, 18.3 percent. Article length would have to have increased by around 700 percent in order to account for this pattern.

data for a single article each. It would, however, be an interesting avenue for future research.

(2) *Has any particular type of use of intuition talk seen a general increase across the academy?* The present study is unable to distinguish different types of intuition talk. It is important to ask to what extent the various disciplines are using intuition talk in similar ways. Other disciplines sometimes use words like "intuition" in some pretty unfamiliar ways (at least to philosophers: see Abernathy and Hamm 1995; Frantz 2004; Haidt and Kesebir 2007; Tallant 2013), and it is unclear from the present study whether the general explosion in intuition talk has been an increase in only some of these uses.

(3) *We tentatively observed that the two halves of the twentieth century exhibited different trends—at least in philosophy. Is this perhaps due to different types of intuition talk?* This is a very interesting question. One naïve thought is that the initial decrease in the proportion of philosophy articles engaging in intuition talk may be due to a decline in a particular way of using such language, perhaps related to a decline in Kant scholarship. Another similar thought is that the same pattern is due to the rise of ordinary language philosophy via its pushing out of pure rationalist intuition talk.³⁶ Again further investigation is necessary as without data it is unclear what this pattern is telling us.

(4) *How does the usage of intuition talk within academia compare with intuition talk outside the academy?* This is an important question. There is some evidence that speaks to this issue. For example, there is evidence suggesting that growth in intuition talk may be a quite general phenomenon that occurred in fiction writing too. For another example, there is evidence that suggests there may be important differences between academic usage and usage in ordinary English, for instance, Cappelen (2012) notes that use of intuition talk to modify contents was very rare outside philosophy. However, again, further research is needed to obtain a clear picture. I say this because Cappelen's data seem to include only one source from outside philosophy that is an academic text. This suggests to me that the difference Cappelen notes may be due simply to a difference between academic and non-academic English. And there is some evidence that supports my suspicion. I conducted a quick search of the corpus of British Academic Spoken English (BASE).³⁷ This contains thirty-five token uses of intuition talk, of which only two are clearly not content related, suggesting that other academic disciplines use intuition talk in similar ways to philosophers.

³⁶ Thanks to Stephen Barker for this thought.

³⁷ The BASE corpus was developed at the Universities of Warwick and Reading under the directorship of Hilary Nesi (Warwick) and Paul Thompson (Reading). Corpus development was assisted by funding from the Universities of Warwick and Reading, BALEAP, EURALEX, the British Academy, and the Arts and Humanities Research Council.

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