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Author/s:
Davies, M;Calma, A

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Australasian Journal of Philosophy 1947-2016: a retrospective using citation and social network analyses

Abstract:

In anticipation of the journal's centenary in 2027 this paper provides a citation network analysis of all available citation and publication data of the *Australasian Journal of Philosophy* (1923-2017). A total of 2,353 academic articles containing 21,772 references were collated and analysed. Results initially focused on finding the most published authors, most cited articles and most cited authors within the journal, followed by most discussed topics and emerging patterns using keywords and abstracts. The analysis then proceeded to apply social network analysis using *Kumu*©—a visualisation platform for mapping systems and relationships using large datasets. Analysis reveals topic clusters unique to the journal. Results from this analysis reaffirms the journal's continuing focus on topics in traditional analytic philosophy such as *morality*, *epistemology* and *knowledge*, whilst also featuring topics associated with *logic* and *paradox.* This paper presents a new approach to analysing and understanding the historic and emerging topics of interest to the journal, and its readership. To our knowledge this has never previously been done for single philosophy journal. This is historically important given the journal's forthcoming centenary. Results also offer wider implications for the future direction of the journal, and for research in philosophy generally.

Keywords: citation analysis, bibliometric analysis, social network analysis, scientometrics, Australasian Journal of Philosophy, Kumu

Introduction

The *Australasian Journal of Philosophy,* established in 1923, is by reputation one of the world's best philosophy journals and is routinely listed amongst the top-10 for journal-rankings in the field. At its inception it was titled the *Australasian Journal of Psychology and Philosophy,* dropping "Psychology" from its masthead in 1946. The original emphasis on psychology is unsurprising. In the nineteenth and early twentieth centuries philosophy was considered in relation to psychology, and how they should be distinguished from each other, and predominantly with idealist themes such as the centrality of experience to moral judgement. More recently, the *AJP* has concerned itself with increasingly specialised and narrowly-focussed topics in analytic philosophy: consciousness, qualia debates, truthmaker realism, nominalism, and so on. Given that the journal will soon celebrate its centenary, how prominent are the earlier themes in the concerns now? Would they be reflected in a citation analysis of the entire history of the journal from its inception to an arbitrary cut-off point of 31st March 2017? Would the spread of topics and issues of the journal over a 94-year period be located in any particular area of philosophy? Which areas would receive most attention? Would the present-day analytic focus overwhelm the journal's concerns, or would continental philosophy, feminist, and post-modernist thought get a look-in? Are hitherto new issues emerging in the early twenty-first century befitting the digital and "post-truth" age, or is the journal still aligned mainly with traditional philosophical issues and concerns in the analytic tradition? In essence, what can the citation "geography" of the *AJP* tell us? These questions can be answered empirically using the citation analysis techniques that we provide in this paper.

Historical Note

When the journal was established in early part of the twentieth century the philosophical world was predominantly idealist in emphasis. In keeping with the spirit of the times, idealist themes greatly captured public attention, and great engagement could be discerned amongst the general population for vibrant philosophical debate. The Welsh orator and Hegelian, Henry Jones (1852-1922) conducted what can only be described as a blockbuster philosophical tour of the country in July and August 1908—an event that can scarcely be imagined today. Three-time Prime Minister of Australia Alfred Deakin attended his lectures, and he dined with both the then Governor and Deakin in Melbourne, and met noted academics such as Mungo MacCallum (1854-1942), foundation Professor of Modern Language and Literature at the University of Sydney, himself strongly influenced by the idealist teachings of Edward Caird in Scotland (as late as 1933, MacCullum stated: 'I don't think the critical Idealism of my young days superseded' [Cable 1986]). Both Deakin and another well-known politician of the time, Dr H. V. Evatt, welcomed Jones' theoretical account of the breakdown of liberalism and socialism they sought to put into practice in the public domain. Attendees to Jones' lectures routinely numbered 800, and he toured the major intellectual centres on the eastern sea-board: Sydney, Melbourne, Brisbane, Adelaide, Newcastle and Wollongong. The resulting ideas from the tour was published in *Idealism as a Practical Creed* [1909]. Clearly, this was a very different philosophical time to the current marginalised state of professional philosophy in Australia (see also Davies and Helegby, 2014).

Thinkers in Australia at the time that were broadly labelled "idealist" included figures such as Henry Laurie (1837-1922), the first appointment in philosophy in Australia at the University of Melbourne; Francis Anderson (1858-1941) the so-called "Christian Idealist" based in Sydney; Edmund Morris Miller (1881-1964) based in Tasmania, Francis Anderson

(1858-1941) in Sydney; William Anderson (1889-1955) in Auckland—brother of noted realist philosopher John (later of Sydney); William Ralph Boyce Gibson (1869-1935) in Melbourne; and the atypical idealist and centenarian William Mitchell (1861-1962) in Adelaide—so described as his methodology was idealist even if his ontology was not (and by his explicit disavowal of the label himself in conversation as recalled by his successor's successor to the Hughes Chair, J. J. C. Smart) [Davies, 1999, 2003]. Some of the themes and concerns of the early traditions of Australasian philosophers are dealt with in some detail in recent articles in the two-volume compendium*: History of Philosophy in Australian and New Zealand* [Oppy and Trakakis, eds 2014] and the much shorter *Companion to Philosophy in Australia and New Zealand* [Oppy and Trakakis, eds 2010].

While idealist in emphasis in its early period, the *AJP* now publishes papers reflecting very different concerns—indeed, it appears on a cursory inspection that idealism has largely disappeared from discussion both in and outside the journal, with notable exceptions in the domain of idealism in political debate [Hughes-Warrington and Tregenza, 2008]. However, this is yet to be empirically demonstrated. The extent to which the focus of the *AJP* has since changed, and the extent to which a history of the journal can be measured in terms of citation metrics, has never been done to our knowledge. Nor has it ever been attempted for the entire history of one philosophy journal before. We attempt that task in this paper. An analysis of this kind will bring into focus the *AJP's* historical emphasis; its most influential thinkers over its long history, and the legacy—if any—they have left to the journal. It might also stimulate other publications in the field to attempt something similar.

Social Network Analysis

Social network analysis (SNA) has become an increasingly popular approach to understanding large data sets. It has been used to analyse the complexity of social relations

[Buch-Hansen 2014]. It also allows researchers to establish connections among complex variables, allowing them to make meaning out of a seemingly convoluted web of unrelated data through the use of visualisation techniques. The use of Google Books *Ngram Viewer*, for example, reveals the use of SNA in indexed books as early as early 1960s. This usage flattened out in the 1980s, with a resurgence of use in 1988 [Google Books 2017]. A steep curve indicates popularity since then. As a result, there has been wide use of SNA in various disciplines. Social networks have been used in fields as diverse as gender studies [Lusher and Robins 2010], community development [Balfour and Alter 2016], project management [Uddin, 2017], decision-making [Junfeng, Xinwang, and Yingming 2016] and water management studies [Kunz, Kastelle, and Moran 2017].

Citation Network Analysis

A specialised area within SNA is bibliometric or citation analysis which examines bibliometric and citation data associated with publications. In this type of analysis co-citations are pivotal. Two authors are co-cited when a single article cites them both—this being a proxy for a connection between their works, be that in agreement or disagreement; lack of co-citation being a proxy for intellectual distance.

Citation analysis has occurred in a number of disciplines in the empirical sciences [Bornmann, Leydesdorff, and Marx 2007; Howard 2011; Leydesdorff 2007], but also in Philosophy [Healy 2013], Archaeology [Brughmans 2010], Higher Education [Budd 1990; Budd and Magnuson, 2010; Tight 2008], Educational Technology [Cho and Park 2012], Instructional Design [Anglin and Towers 1992], as well as Public Health, Medicine, Engineering, Economics, Human Research Management and Sports Psychology [Bruner, Erickson, Wilson, and Côté 2010; Moore, Shiell, Hawe and Haines 2005] as well as lesser-known fields such as Coaching Science [Rangeon, Gilbert, and Bruner 2011]. Most recently,

our own work in the discipline of higher education has been instructive in demonstrating an international rift in terms of citations, with US authors only citing other US authors in US journals, and making no mention of UK/Australian authors, where this was not the case within Australian and European journals which show a far wider indication of influence [Author1 and Author2 2015; Author2 and Author1 2017]. We also found seven distinct clusters or areas in the field where "doctoral education" showed as the most connected topic to authors and keywords, this being the principal historical concern of the journal *Studies in Higher Education*. We were also able to bring an empirical analysis to Macfarlane's rough conceptual notion of a higher education "archipelago" consisting of islands of influence of various theoretical positions in the discipline [Macfarlane 2012; Author1 and Author2 2017]. In this paper we apply similar level of analysis to the discipline of Philosophy using citation from the *AJP* as our source data.

Application to Philosophy

The application of citation network analysis to the discipline of Philosophy has been patchy. Many of the papers exploring citation networks in the discipline focus purely on bibliometric elements, i.e., whether books or journals are predominant in discussions of philosophical topics (the former are), and not what citations tell us about Philosophy as a discipline [Cullars 1998; Herubel 1991; Hyland 1999; Lindholm-Romantschuk and Warner 1996; Knieval and Kellsey 2005]. This former discussion is a topic for librarians, not philosophers, and is therefore of little interest.

Of more philosophical interest, Ahlgren, Pagin, Persson and Svedberg [2015] conducted a citation analysis of a number of publications on the topics of free will and the Sorites' paradox. This has been the only detailed, issue-specific application to the discipline of Philosophy to date. They mapped frequently occurring terms and co-occurrences and

found an increase of publications on the topic of free will in the social sciences, medicine and natural sciences. They concluded that research in free will appeared in clusters of co-cited papers in non-philosophical fields such as neuroscience and physics, an indication of its multidisciplinary character. This might be instructive to those working in the field, but it has little wide-spread application to Philosophy as a discipline.

Of greater philosophical interest is a paper by Kreuzman [2001]. Kreuzman applied citation analysis techniques to the alleged isolation of the philosophy of science from other areas of philosophy, particularly to an area which with it should be most closely aligned, epistemology. If true, this dissonance is perplexing given that both areas are concerned with topics such as the nature of knowledge, rationality, truth, and so on, and both trace their intellectual roots to Wittgenstein, Carnap, Russell, and earlier to Hume, Locke, Kant and Descartes. An isolation in terms of respective research programs was identified as early as 1956 by Wilfred Sellars:

> There is a widespread impression . . . that philosophers of science deal with a mode of discourse which is, so to speak, a peninsula offshoot from the mainland of ordinary discourse. The study of scientific discourse is conceived to be a worthy employment for those who have the background and motivation to keep track of it, but an employment which is fundamentally a hobby divorced from the perplexities of the mainland [Sellars 1956: p. 174].

Is this claim true? Anecdotal evidence for this proposition can be found in the lack of citations in books in epistemology to the area of philosophy of science, and vice-versa according to Kreuzman [2001]. They seem to function as separate enclaves. Putting this hypothesis to the test, Kreuzman examined the frequency with which authors are co-cited.

To assess this, a representative list of 62 philosophers writing on the topic of rationality was compiled using the *Arts and Humanities Citation Index.* The resulting analysis did find a gulf between the areas: philosophers of science being represented on the cluster map to the left of the mid-axis and epistemologists being on the right (see Figure 1 below). It appears theorists working in the areas of the philosophy of science and epistemology do not cite each other. As a lack of co-citations is a proxy for intellectual distance, it seems they do not influence each other either.

Interestingly, sub-clusters within each domain demonstrate allied groupings of philosophers with a different account of scientific rationality. For example, the largest cluster representing the Kuhnian domain (centre-left) is composed of three sub-clusters: "strong programme" Kuhnians, Kuhnians, and the more positivist-inclined Kuhnians. The "strong programme" theorists (Barnes, Bloor, Latour, and Fuller) reside above the main Kuhnian set in the middle. By contrast, those theorists that inherited positivist attitudes to science that view values and social factors as playing a less important a role in theory adopted and change (Hempel, Salmon, Achinsteein, Fraassen) are represented in the lower sub-cluster. Other sub-domains within the philosophy of science can be recognised: e.g., feminist critics of science (far top right) and localised views on deflationist views on time in science (lower left).

On the epistemology side of the matrix, we see clusters in contemporary epistemology concerning issues related to the internalist-externalist debate, foundationalism, coherence, or reliabilism. It should be remembered that this study includes only a limited set of 62 philosophers writing on the topic of rationality. Despite this, the resulting citation network analysis is instructive, providing as it does a "geography" of the discipline area and confirming that epistemology and philosophy of science largely talk past each other.

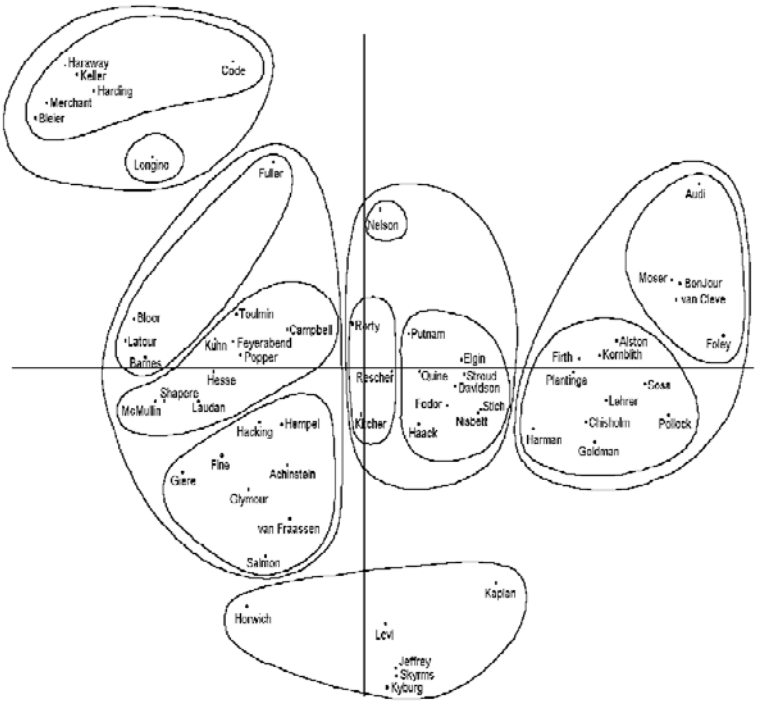


Figure 1. Multidimensional scaling map of 62 philosophers with five major and 11 minor embedded clusters [in Kreuzman 2001]

One attempt to document a citation network of the discipline of Philosophy *in toto* is the work by Healy [2013]. Healy took twenty years of publications (1993-2013) from four key philosophy journals: *The Journal of Philosophy, Nous, Mind, and The Philosophical Review.* He subjected 2,200 articles from these journals to a detailed citation analysis using the community detection algorithm designed by Neal Caren and used with the discipline of Sociology [2012]. Healy's selection of 2,200 papers cited 34,000 items. Results showed the co-citation patterns for 520 most-cited books and articles in the journals under consideration (the cut-off being those items that received fewer than ten citations).

Healy's analysis focussed on three main areas of philosophy: metaphysics, epistemology, and ethics/political philosophy. He found that metaphysics, broadly conceived, comprised the core of the citation network centring the pivotal work of Lewis (*On the Plurality of Worlds*) and Kripke (*Naming and Necessity*). These were the major clusters in the

network. These two clusters were bridged by works by Fine [1994], Forbes [1985], and Lewis [1983; 1968]. These clusters, in turn, were connection to two additional clusters Quine's *Word and Object* [1960] and Chalmers' *The Conscious Mind* [1996] the only Australian thinker in the metaphysics cluster. Healey's analysis appears below. As the static version is impossible to read owing to the size and complexity of the relationships, a small segment of the matrix is provided (Figure 2). A dynamic navigable version of the entire dataset appears here: https://kieranhealy.org/philcites/ Note that the colours of the nodes are generated inductively from community-detection algorithm which was applied to the co-citation matrix.

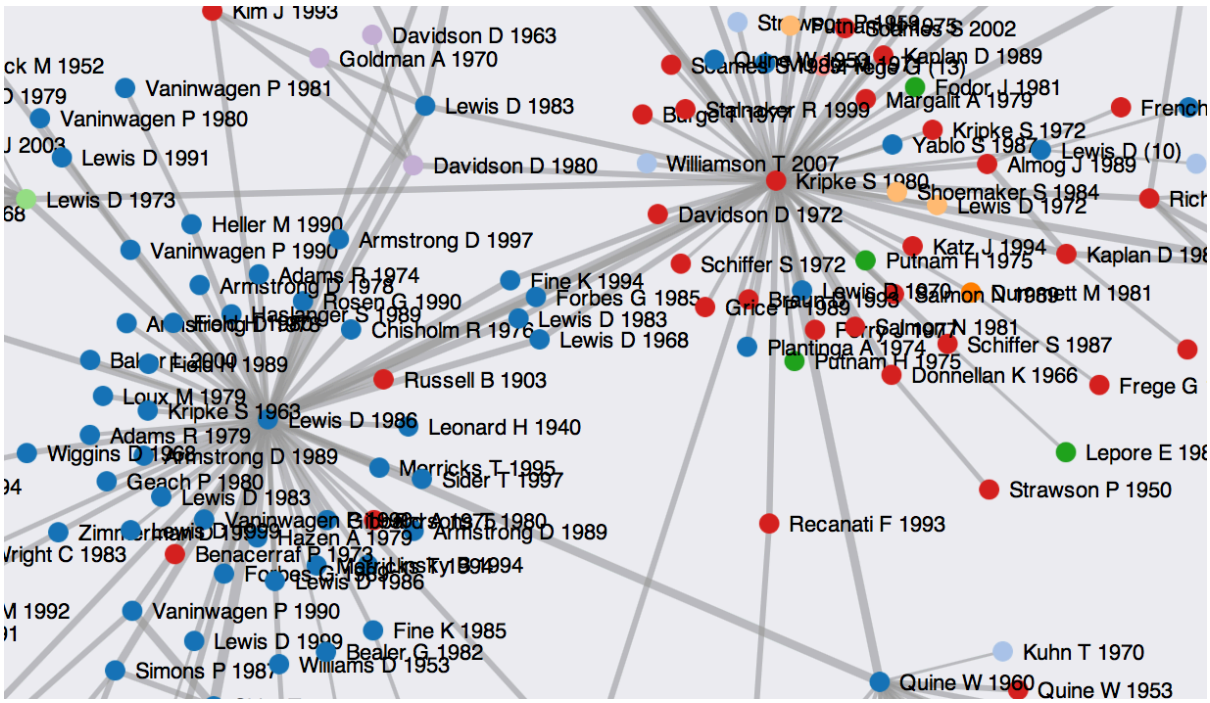


Figure 2. A segment of a co-citation network of Philosophy [in Healy 2013]

In the area of epistemology, the key clusters were Williamson [2000], DeRose [1995] and Hawthorne [2004]. Lewis [1996] also features again here confirming his considerable influence in at least two major fields of contemporary philosophy. Outside the ambit of these areas older debates can be seen as distinct clusters involving Bonjour [1985], Plantinga and

Grim [1993] and Goldman [1986]. Two prominent clusters in the philosophy of mind over the past twenty years are anchored by Fodor's work on intentionality [1994] and Chalmers' variant of property dualism [1996].

In the area of ethics and political philosophy the major clusters were Rawls' *Theory of Justice* [1971], an unsurprising inclusion, and the metaethical concerns that connect works by Scanlon [1998], Parfit [1984], and Australian, Michael Smith [1994]. Surprisingly, another prominent Australian in the field, Peter Singer, is not featured in the major ethical debate clusters, but it should be recalled that the analysis was drawn from journals over a twenty-year period, and Singer's major cited works *Animal Liberation* [1975] and *Practical Ethics* [1979] occurred well prior to this.

Further refinements to the dataset by Healy drew more attention to citation clusters centring on the influence of Davidson [1980], van Inwagen [1990], Putnam [1975], and the perennially important Wittgenstein [1953]. But it is clear that, for a more accurate account of the spheres of co-citation influence, a longitudinal dataset is needed. Note also that when Healy and Caren did their work, there were less sophisticated and reliable open-source softwares available and they had to develop their own specific algorithms for their purposes. Now there are a variety of softwares available to visualise citation networks. We outline our use of one such software below.

A more recent attempt to map the entire discipline of Philosophy draws on a categorisation schema in PhilPapers [2017] and adopts a quite different analytical approach focussing not on citation networks (i.e., who cites who) but on mapping out the fields and subfields of the discipline—an indication of the size and breadth of each field. Valentin Lagegard has attempted an analysis of the entire field of Philosophy using NetworkX, a Python software [Open Culture 2016]. This mapping activity can be viewed here: http://dailynous.com/2016/06/28/a-taxonomic-map-of-philosophy/

Healy's work is interesting, but it too is necessarily limited. It analyses only 20 years of data, and across only four representative journals. Philosophy journals have a quite different emphasis, of course, and this can skew the data (a not unreasonable question is why were some journals included and others excluded?) Lagegard's data too, whilst impressive, is centred on a categorisation schema and does little more that visualise the numbers of papers within each itemised category. No definitive conclusions can be drawn from these studies other than showing how Philosophy-visualised presents a "pretty picture".

To date no paper to our knowledge has adopted a synoptic approach by investigating the entire history of the citation data of a single journal in philosophy. Nor has any study used data visualisation techniques like *Kumu*©—a visualisation platform for mapping systems and relationships using large data—in the field of philosophy; a task we set ourselves in this paper. What we aim to achieve in this paper is a novel approach to visualising the accumulated knowledge in the journal over the entirety of its 94-year period, and to present the information in a way that was otherwise not previously possible without advanced visualisation tools. This approach also provides a longitudinal and yet synoptic view. From this, it is possible to generate empirically-based local conclusions about the field of Philosophy through the entire history of publications in one particular journal, the *AJP*.

Methods

A search was made on 31st March 2017 of various databases including *Web of Science, Scopus* and *Philosopher's Index* to gather all *Australasian Journal of Philosophy* and *Australasian Journal of Psychology and Philosophy* publications from the arbitrary default year of 1900 to the date of search. This revealed a combined total of 2,353 articles from 1923 onwards. Various databases were needed simply because there is no single database that

indexes all publications since 1923. The combined *Scopus, WoS* and *Philosopher's Index* data provide a more comprehensive and reliable dataset; thus, it was used in this study. The data contains all bibliographic information about each article such as author(s), title, keywords, abstracts, publication year and cited references. However, older articles expectedly contained less metadata than newer ones.

The initial analysis used the databases' own analytics feature. For example, in *Scopus*, there is the ability to display the most published authors, most cited papers, most published countries and top publication years. We used this data as a reference to compare to when we did our own analysis. The secondary analyses we conducted were those that were based on the combined data pulled from various databases which made up the 2,353 articles. This was done using Excel in most cases and through the use of network visualisation tools, principally *Kumu*©.

Results and Discussion

Available analytics from Scopus were used to provide baseline data to compare with our own. Scopus can generate results for the most published authors, most cited article, top publishing organisation, top publishing countries, and most productive years. The most published author in the *AJP* throughout the 94-period surveyed was the venerable J. J. C. Smart (16 associated publications—note that solo or co-authored publications are included in the counts). Smart is followed by the equally venerable David K. Lewis and J. L. Mackie with both 15 articles respectively.

Smart might be the most published, but the most cited—and hence, arguably the most influential—single article in the *AJP* is Lewis' "New work for a theory of universals" published in 1983 with 599 citations. Impressively, this is followed by three other publications by the same author: "Elusive knowledge" (1996; 566 citations); "Psychophysical

and theoretical identifications" (1972; 350 citations); and "Putnam's paradox" (1984; 227 citations). Thus, Lewis is therefore the most cited author in the journal's history (with citations within and from outside of the journal) based on four publications mentioned, totalling 1,742 citations. This demonstrates unambiguously that Lewis was more than an influential philosopher by hearsay reputation—and a frequent visitor to Australia—he dominated citation counts in the national philosophy journal as well. That's an empirical certainty. Smart was famous for saying: 'I taught David Lewis [in graduate studies in the US]; or rather, David Lewis taught me' [O'Grady 2001]. Such a statement expresses the admiration the most published author in the *AJP* has for the most cited author.

In terms of international presence, the United States has the most contributions with 636 articles over the 94-year period, followed by Australia (305) and the UK (183), demonstrating a clear Anglo-centric bias; unsurprising perhaps, given the *AJP's* traditional focus on analytic philosophy. The institution most represented in the journal is the Australian National University with 48 publications followed by the University of Sydney (46) and the University of Melbourne (43); all the peak institutions in terms of historical dominance (the Sydney-Melbourne rivalry being more than a long-held geographical preference, but even a way of "doing" philosophy.)[1] Despite being arguably the most influential single institution internationally—the historical "home" not only of Australasian materialism, and the Identity Theory, but also U. T. Place's brain—Adelaide University does not feature in the top-ranked citations count within the national journal in the historical period under investigation.

[1] "Sydney rules" and "Melbourne rules" were said to apply in Australian philosophy conferences from 1927 onwards when John Anderson was appointed to the Chair at Sydney. This was when, according to Franklin [2012], 'the two cities set off on different paths' [p. 131]. . . 'Sydney rules stipulated that Anderson read a paper and then members of the audience could make comments, followed by Anderson's reply to such points as he chose. Under Melbourne rules, a single point could be discussed by everyone until it was finished with, leading to a much more spontaneous and focussed discussion'. This difference in approach is said to have arisen from Melbourne philosophers encouraging diversity in appointments, and Sydney being dominated by the doctrinaire, but influential, cult of Andersonianism [Smart 1989; cited in Franklin 2012: 134-5]

The most productive years in the journal's output to date is 1986 with 52 publications followed by 1995 (51) and 2016 (45). Note again that the search date end is 31 March 2017 and these results are only from Scopus.

Most published authors (combined data)

Limited by the availability of a single database source, we combined all articles from various sources and came up with our own analyses which we reproduce as follows.

We know that the most published authors are Smart, Lewis and Mackie (Scopus). However, we wished to know whether their publications were solo papers or joint publications with other authors. To begin with, the 1,877 articles were produced by 2,037 authors. The number of authors ranges from 1 to 5. Only one article has five authors, two with four authors, 14 with three authors and 143 with two authors. Note that 30 articles have no author names available. Instead of Smart, we found Lewis with the most number of publications followed by Smart, Mackie, Prior and Armstrong. We also found that the top five authors published solely.

Table 1. Most published authors within the *Australasian Journal of Philosophy*

Rank	**Author**	**Number of publications as solo author**	**Number of publications as first-named author**	**Number of publications as co-author**	**Total**
1	Lewis D	16	0	0	16
2	Smart JJC	15	0	0	15
3	Mackie JL	14	0	0	14
4	Prior AN	13	0	0	13

4	Armstrong DM	10	0	0	10

Most cited authors within the *Australasian Journal of Philosophy*

Note that only articles from 1970 onward were found to have references. There are also 50 articles between 1970 and 2016 that have no references. This appears to stymie any attempt to capture data from the earliest days of the journal. There were 21,772 references found in total. However, not all of them are usable. This is due to various reasons. One reason is the referencing style adopted in the journal where 'ibid' is used (426 instances). Where it is used, it is usually ibid followed by a page number. Since ibid follows from an already included reference, the references associated with ibid are still part of the analysis. The other references are acknowledgements in footnotes (e.g. "I will here use the word 'models' to refer to brief and schematic descriptions of the approaches" or "I thank Roy Sorensen for pointing this out to me") and they were excluded in the analysis. Only those in the format beginning "Author, Year" were included. Although this has reduced the number of references to at least 19,000, it does provide accurate counts and only include names of authors, year of publication and the title of publications. Again, the most highly-cited author in the journal is D. K. Lewis with 529 citations followed by D. M. Armstrong, G. Priest, F. Jackson and D. Davidson.

Table 2. Most cited authors within AJP

Rank	**Author**	**Number of citations**
1	Lewis D	529

2	Armstrong D.M.	242
3	Priest G.	152
4	Jackson F	116
5	Davidson D	95

Most cited articles within the *Australasian Journal of Philosophy*

The data for the most cited articles is unreliable due to a number of reasons. Once again, the references use a style which is problematic because it uses Latin terms such as “ibid”. This makes it difficult to track each reference in the Author, Year format when sorting data. Many of the citations also contain notes, numbers, pages and surnames. For the sake of illustration, to show how unreliable the data is, we find below only 32 occurrences of Lewis’ *New work for a theory of universals* compared to 599 citations given earlier. However, we include these results for sake of completeness.

Table 3. Most cited articles within AJP

Rank	**Article**	**Count**
1	On the plurality of worlds	72
2	Counterfactuals	34
3	New work for a theory of universals	32
4	Elusive knowledge	16

Most used author-submitted keywords

Only articles from 2012 have author-submitted keywords (175 articles). Keywords range from 1 to 8. A total of only 1,246 keywords were found.

Table 4. Most used author-submitted keywords

Rank	Keyword	Count
1	Moral/Morality	15
2	Epistemology Epistemic	14
3	Knowledge Theory	11
4	Belief Semantics Disagreement	9
5	Explanation Truth	8

Let us take a closer look at the top three author-submitted keywords.

The 'Morality' network

The Moral network includes 14 topics that discuss morality, including terms such as *moral judgment, moral disgust, moral psychology, amoralism, moral motivation, moral responsibility, moral semantics, moral standards, moral immunity, moral epistemology, moral realism, moral paradox, moralisation* and *moral error theory.* Although it is the most used keyword in all published articles with author-submitted keywords, and the biggest network, it is the most dispersed network. Moral topics appear silo-ised and less connected to

the other ‘morality’-related terms. For example, Barber coined three moral terms and none are connected to others in the network. They sit alone and can be considered with no or minimal impact within the network (Figure 3).

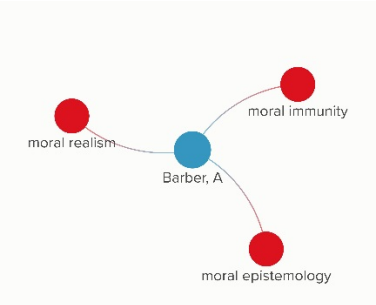


Figure 3. Barber’s sub-network

The topic with the most impact in the Morality network is *moral responsibility* which is discussed by other authors and whose other topic keywords connect more with the other authors. The network is too large to show on this page but a 3-degree focus is possible, as shown below (Figure 4). Note that a network diagram can be viewed or focussed in three ways: 1 degree (direct), 2 degrees (indirect) and 3 degrees (extended). A 1-degree focus shows the closest connections to the keyword “moral responsibility” (those authors who coined “moral responsibility” as a keyword) while a 2-degree focus includes other keywords those direct authors used together with moral responsibility while a 3-degree focus extends to other authors who also used any one of the 2-degree keywords.

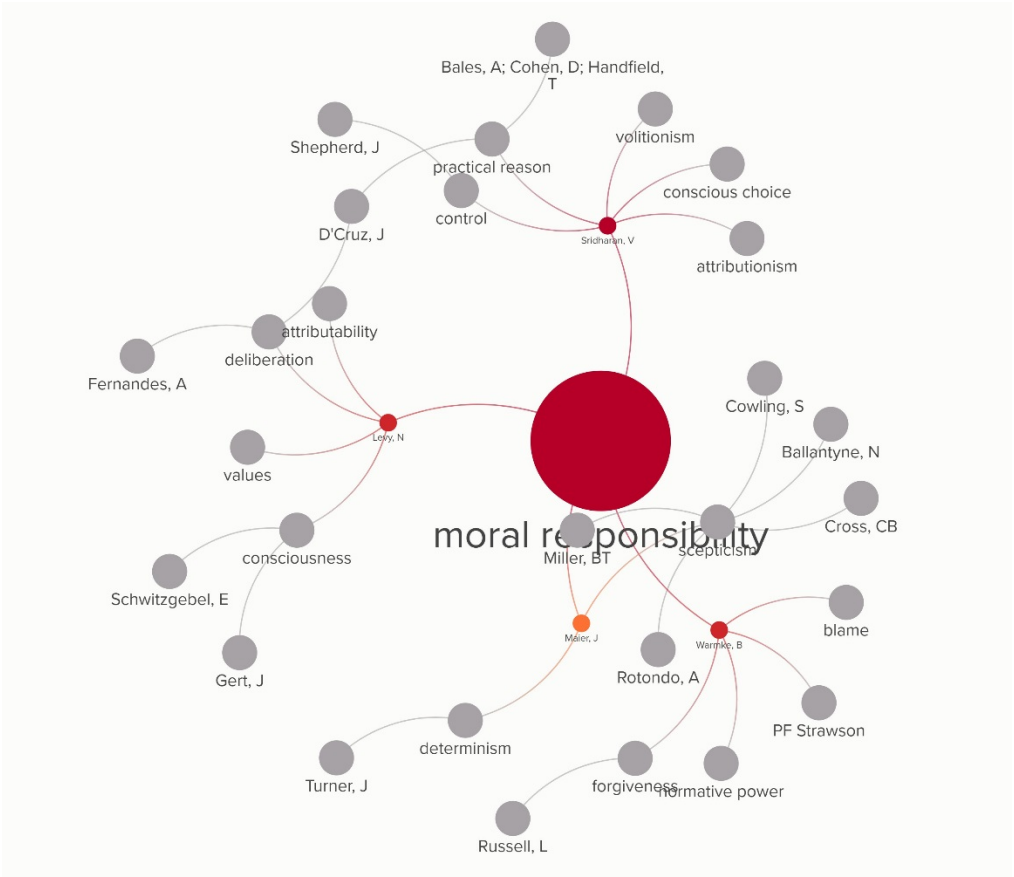


Figure 4. Moral responsibility sub-network

We find that Sridharan, Levy, Maier and Warmke have the strongest networks associated with moral responsibility from a citation analysis. An examination of the above network shows that the keywords most close to moral responsibility include topics such as *determinism, control, blame, scepticism, determinism, accountability, deliberation* and related topics.

We have indicated earlier that the Morality network is too large to fit in this page, as can be seen below (Figure 5), and unreadable. However, it is placed here to indicate that the Morality cluster includes isolated subnetworks [all yellow (smallest) to red (largest) gradients] with only *moral psychology* (west end) and *moral responsibility* (centre) being the largest two. We have placed a dynamic, navigable version of this network here: /////

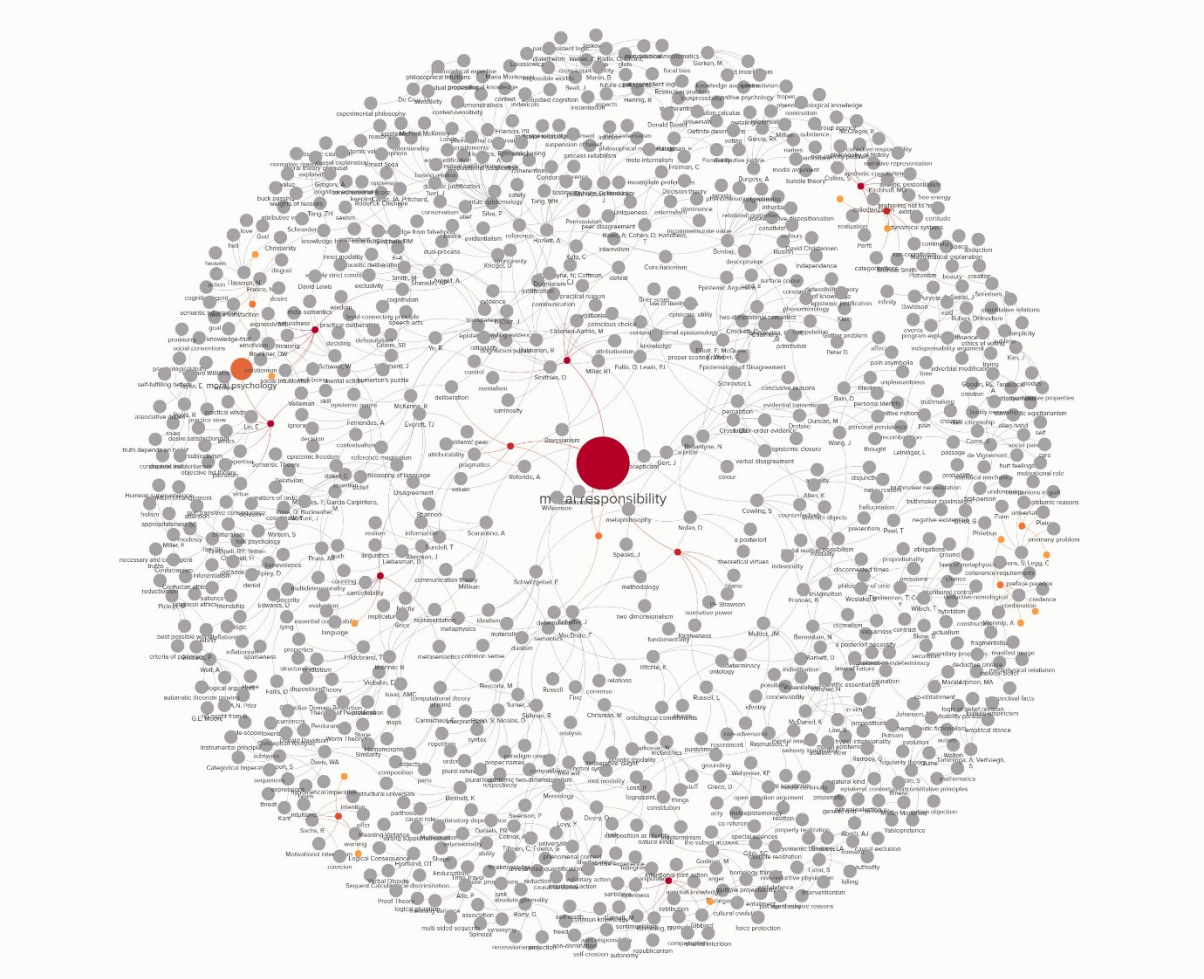


Figure 5. Moral network - all

Moral responsibility was also most discussed in the journal in 2013, 2014 and 2016, where this keyword together with other related keywords was coined by a number of authors (Figure 6).

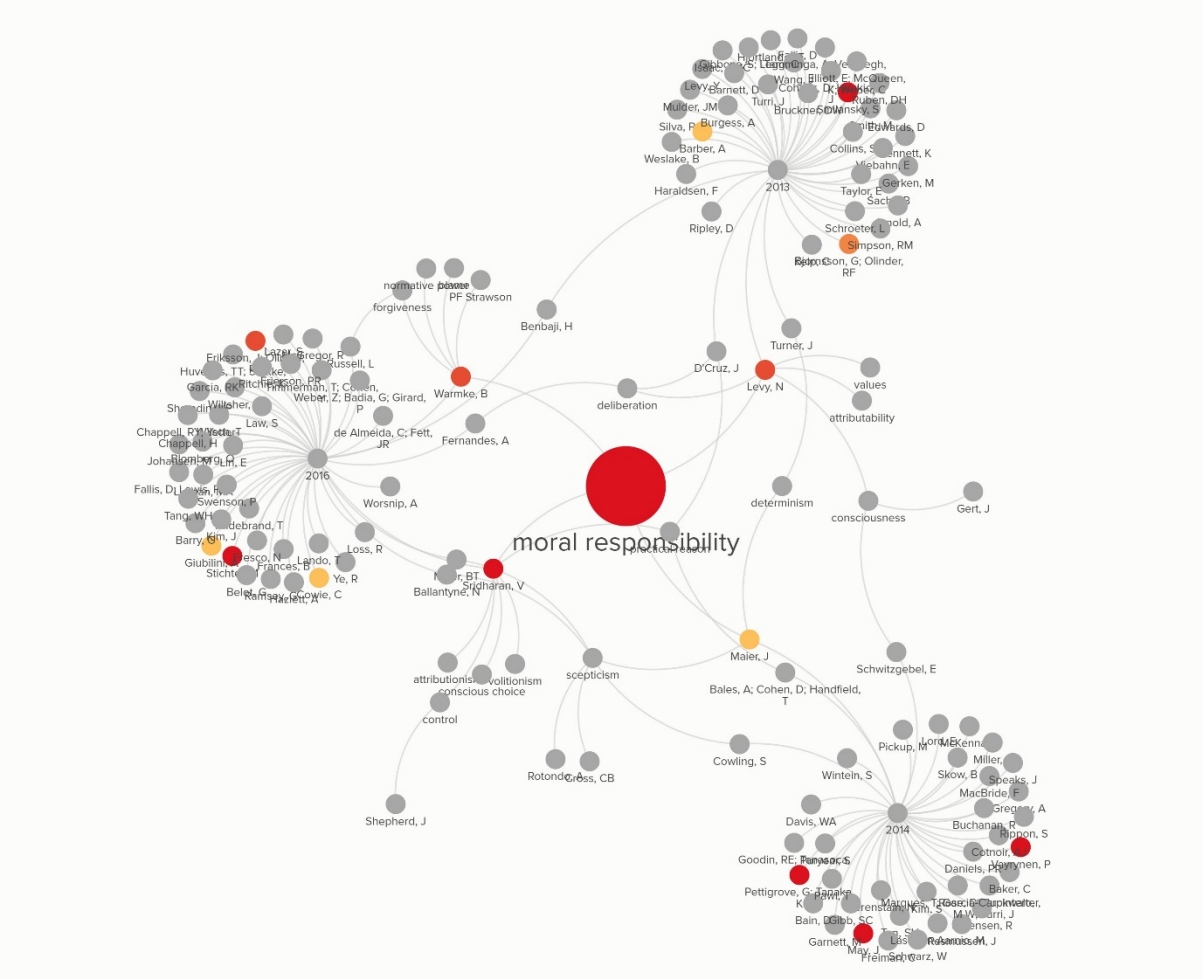


Figure 6. *Moral responsibility* network with years

The other most used keywords were *epistemology* and *knowledge* which we did not include here as those are merely mentions of general philosophical fields.

Most used publisher-used keywords

There are two sets of keywords linked to each article in *WoS*: those submitted by authors (Author Keywords) or those used by *WoS* (Keywords Plus®). In contrast to author-submitted keywords, *WoS*-used keywords first appeared in the *AJP* in 1990 although the data is again incomplete. There are issues were only a few articles have Keywords Plus in the same issue. A total of 991 *WoS*-used keywords were found. The term 'Knowledge' ranks first with 20

counts, followed by ‘Logic’ (15) and ‘Paradox’ (14). Other most-used *WoS*-used keywords are ‘Belief’ and ‘Truth’ (both with 10 counts); ‘Defense’, ‘Mind’ and ‘Objects’ (9 counts each); and ‘Laws’ (8 counts).

The ‘Knowledge’ network

The *WoS*-used keyword ‘Knowledge’ network includes *concessive knowledge attributions, core knowledge, knowledge, knowledge account, knowledge attributions, priori knowledge and self-knowledge* (see Figure 7). Compared with the author-submitted keyword Morality network earlier, it is well-connected and less dispersed and more connected to other keywords and authors.

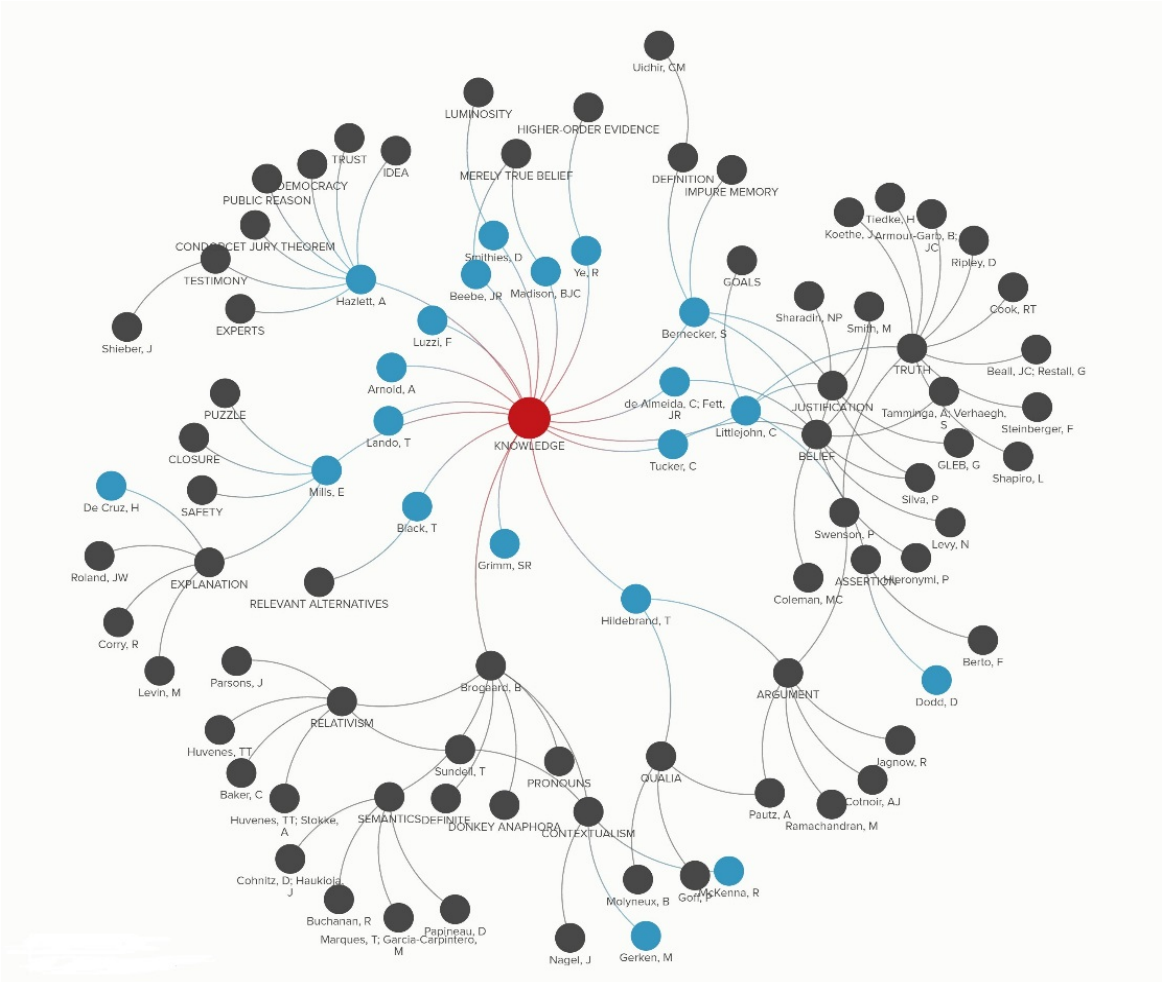


Figure 7. The Knowledge network (publisher-used keywords)

The 'Logic' network

The 'Logic' network includes topics such as *logical paradoxes, logical pluralism* and *relevance logic*. Again, the logic network that includes all these terms is not shown here as it is too large. Instead, only the network for "Logic" *simpliciter* is shown in the diagram below (Figure 8). When compared with the other smaller networks, "Logic" has been automatically resized in *Kumu*© to account for the relative size of the network. The size of "Logic" network is bigger than *logics* network, the *logical paradoxes* network and so on. The keyword "Logic" illustrates that there at least 14 major theorists working in various areas of logic. Note again that a network diagram can be viewed in three ways: 1 degree (direct), 2 degrees (indirect) and 3 degrees (extended). A 1-degree focus shows the closest connections to the keyword "logic" (those authors who coined logic as a keyword), while a 2-degree focus includes other keywords, those direct authors used together with logic while a 3-degree focus extends to other authors who also used any one of the 2-degree keywords. Unsurprisingly, "Logic" has a strong connection to terms such as *paradox, contradiction, defense, truth* and *belief* as shown by their own small sub-networks. This indicates the relationship of "Logic" to allied research topics in the *AJP*.

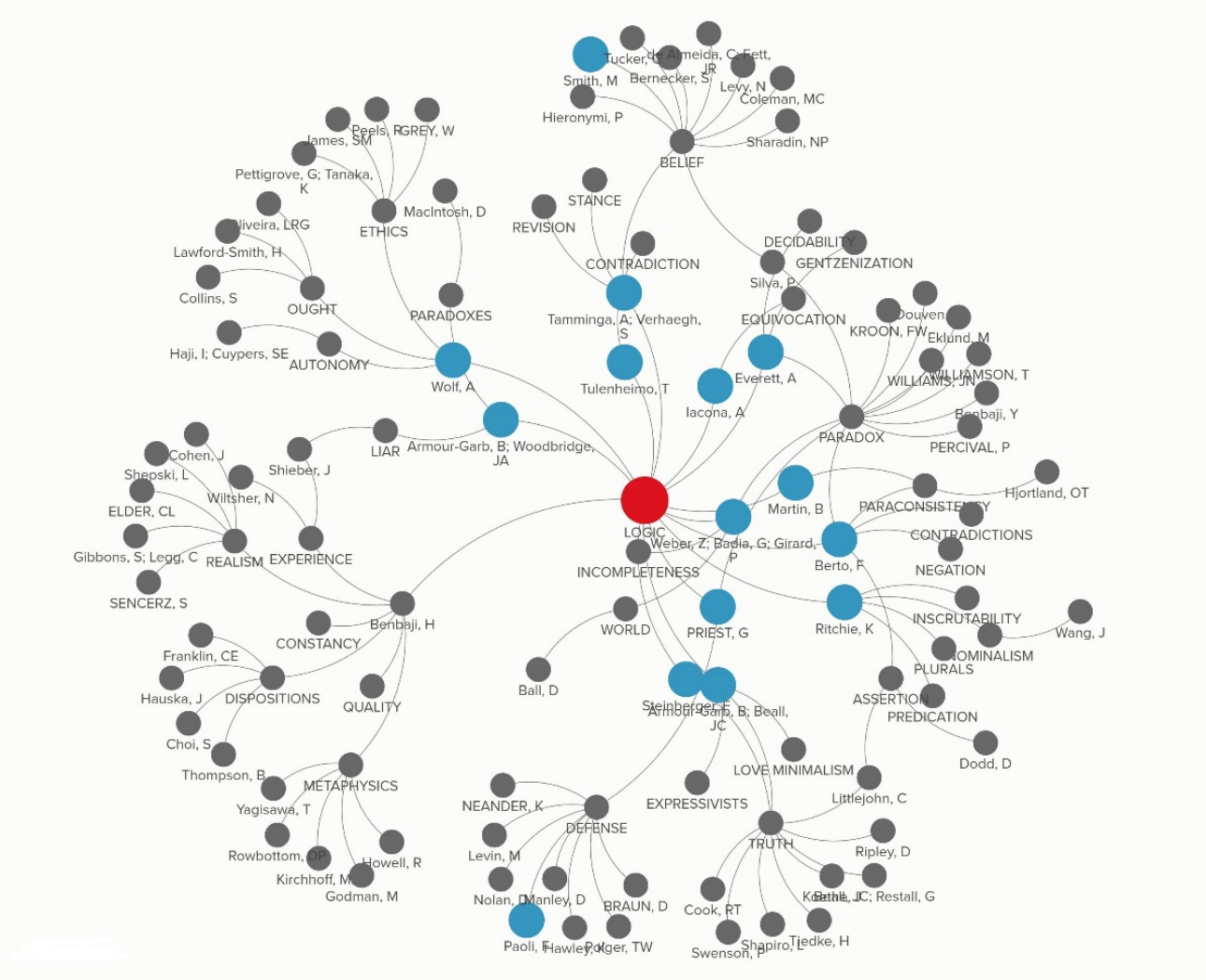


Figure 8. The Logic network

The 'Paradox' network

With a clear connection to the "Logic" network, the "Paradox" network includes terms such as *apology paradox, liar paradox, logical paradoxes, sorites paradox* and *yablos paradox* as allied keywords (Figure 9).

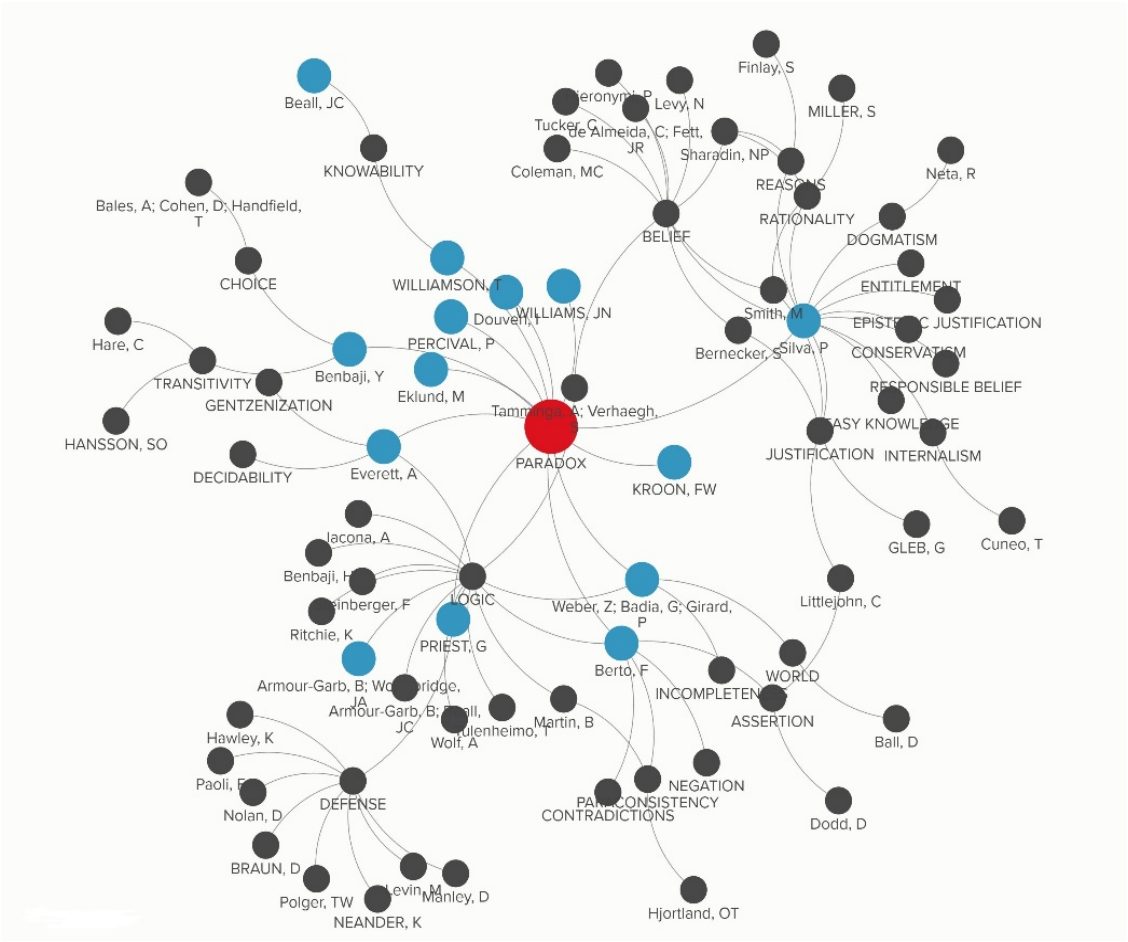


Figure 9. The Paradox network

From the distribution of keywords in the *AJP*, the Logic and Paradox clusters intersect while the Knowledge cluster is separate. Unsurprisingly, there are deeper connections between the topics and authors in both the Logic and Paradox clusters (paradox being a logical problem) and a degree of distinctiveness in the topics of interest within the Knowledge cluster. Epistemological concerns are largely distinct from concerns in logic. Interestingly, this seems to mirror Kreuzman's [2001] findings in respect of the domains of philosophy of science and epistemology. However we have found this division within citations in the history of citation within a single journal. Note that the data include *WoS*-used keywords since 1990 when they were first used through to the arbitrary 2016 cut-off. This includes 415 authors and 991 keywords. Figure 10 below illustrates this. The range of articles

varies from publication dates between 1990 and 2016. The region where "Paradox" and "Logic" overlap indicates the five articles that use both keywords. This region primarily relates to topics about *dialetheism, adunation* and *material exclusion* and *inconsistent truth tables*.

The Logic cluster includes papers published from 2003 to 2016 while the Knowledge cluster includes data from 2002 to 2016. There is no single unifying topic in the Logic cluster as the nine authors discuss a variety of topics such as *ontology, semantics* and *dialetheism*. To give this cluster some perspective, where the "Logic" keyword was used in a paper, it was used by *WoS* together with other keywords such as *truth, contradiction, belief, ethics*, to name a few**.** In the case of the Knowledge network, where the "knowledge" keyword was used, it was used together with *belief, luminosity, qualia, truth, justification, impure memory,* and so on, and also feature a variety of topics such as *scepticism, reliabilism, deflationism, dogmatism puzzle, quidditism, mentalism* and others. Like Kreuzman's finding regarding philosophy of science and epistemology, the Logic and Knowledge domains in the *AJP* large talk past one another.

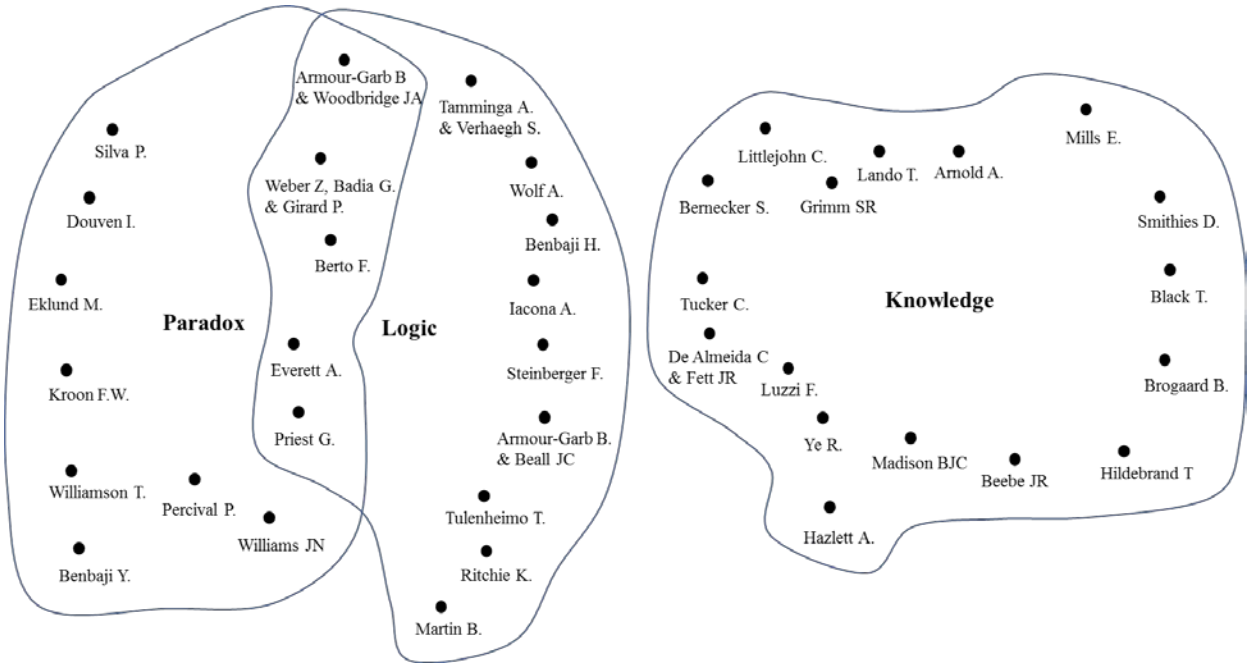


Figure 10. Paradox, Logic and Knowledge clusters

Most discussed topics using abstracts

Only 519 papers were found with abstracts, starting from 2003. Prior to that, there is only one or two articles each year that have abstracts. A total of 68,635 words were found. Ignoring articles and prepositions, commonly-used terms such as “Argue” (350 occurrences), “Theory” (258), “Argument” (239), “Moral” (155) and “Knowledge” (134) feature most prominently in the abstracts. While little can be drawn from this, it does indicate that philosophical discussions in the journal centre on key analytic terminology (a journal in the continental tradition would, one suspects, use very different key terms.)

The following tag cloud (Figure 11) illustrates all 68,635 words used in abstracts throughout the journal’s history. These represent the number of occurrences of these words using Wordle’s word count feature. The bigger and bolder the text; the more times it has occurred. Ignoring some words such as “argue” and “paper” (which relate mostly to statements such as: “In this paper, I argue…”), most topics in abstracts centre around terms such as “argument/arguments” (212/82), “moral/morality” (155/12 occurrences), “problem/problems” (116/48), “reasons/reason” (90/65), “truth/truths” (107/36), “objections/objection” (69/72), “knowledge” (140), “belief/beliefs” (76/40), and “question/questions” (66/21).



Figure 11. Most discussed topics using abstracts tag cloud

A separate analysis is made in Excel to reveal 'filtered word counts'. This allows for a single count for a given word variation (e.g. *argument* and *arguments* are counted as one). We focussed only on the top three topics/words: the "argument/arguments" group which we will call the "Argument" network; the "moral/morality" group we will call "Moral" network; and the "problem/problems" group which we call "Problem" network.

Data reveals that *Argument, Moral* and *Problem* are have the highest unfiltered counts, however *Argument, Objection* and *Problem* have the highest filtered word counts (an indication that the journal is strongly centred on the mechanics of arguments rather than discipline-specific areas to which the arguments apply). We analyse these three networks further in the next sections. We can see from the diagram below (Figure 12) the frequency of use of such words from 1970 (when abstracts began) through to 2016. It can be seen that the *AJP* has had an increasingly technical, argument-focussed, analytic *oeuvre* since 2002.

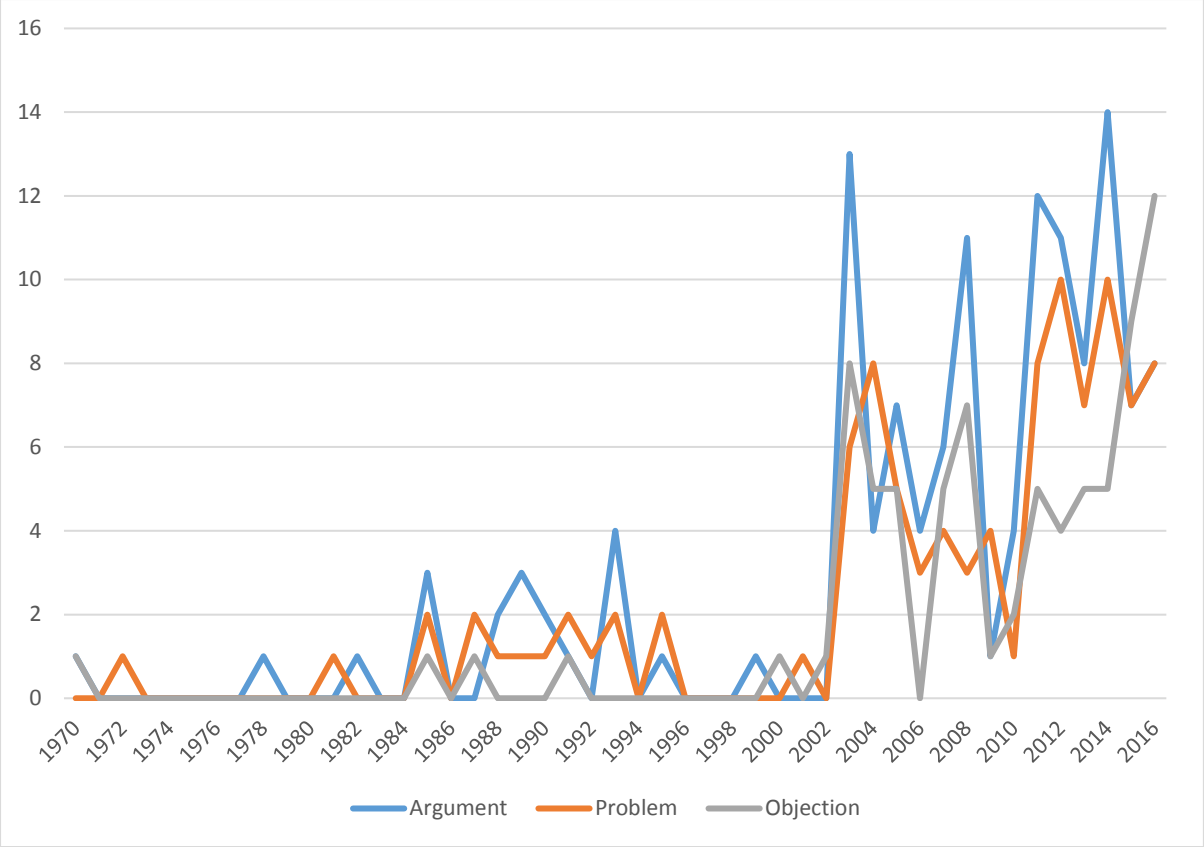


Figure 12. Argument, problem and objection use trends

The "Argument" network

We found 130 papers that use the terms "argument" or "arguments" in their abstracts. This emphasis on "argument" is becoming more pronounced since 2000 (Figure 13). While the nature of papers submitted to *AJP* would all involve argumentative positions owing to the journal's aims and scope, it is worth examining the main themes of those arguments. The themes do not involve "argument" in a commonly-understood sense of course. The Argument network relates mostly to publications that criticize arguments as to how unsuccessful they are, or how arguments fare better than existing or well-known arguments in the field. In terms of critique, it includes discussions of how previous arguments have been inadequate and criticisms as to how and why arguments have failed and why they should be rejected. This is, of course, the analytic philosophers' stock in trade. However, from inspection of the papers

themselves, it is quite rare that scholars discuss the implications of arguments in topics related to broad national policies debates in Australian public life. The discussions of arguments in the journal remain stubbornly and narrowly-focussed on topics of obscure philosophical interest. The journal, it seems, is not one that encourages or fosters a spirit of argumentation as it pertains to public intellectualism.

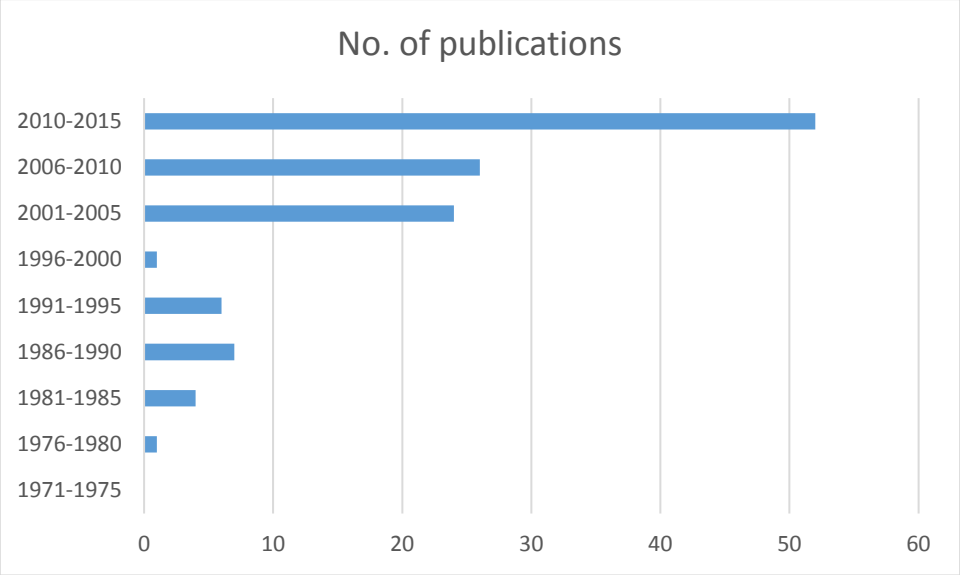


Figure 13. The Argument network, 1971-2015

The "Problem" network

We found 101 papers that use the terms "problem" or "problems" in their abstracts. Again, this is the philosophers' stock in trade, and is increasingly pronounced in the journal since 2000 (see Figure 14). The Problem network discusses the criticisms with previous or current arguments written by other authors and the associated problems with those arguments; for example, problems with *epistemological scepticism*, *propositional knowledge* or *colour irrealism*. Understandably, there is a strong correlation between the Argument and Problem networks. The Problem network includes "value problems", problems associated with various kinds of theorisation, and problems arising from specific claims, e.g., the much-discussed Gettier Problem. There is also frequent mention of problems associated with modal-theoretic, and Lewisian-inspired topics such as *actualism* and *possibilism*.

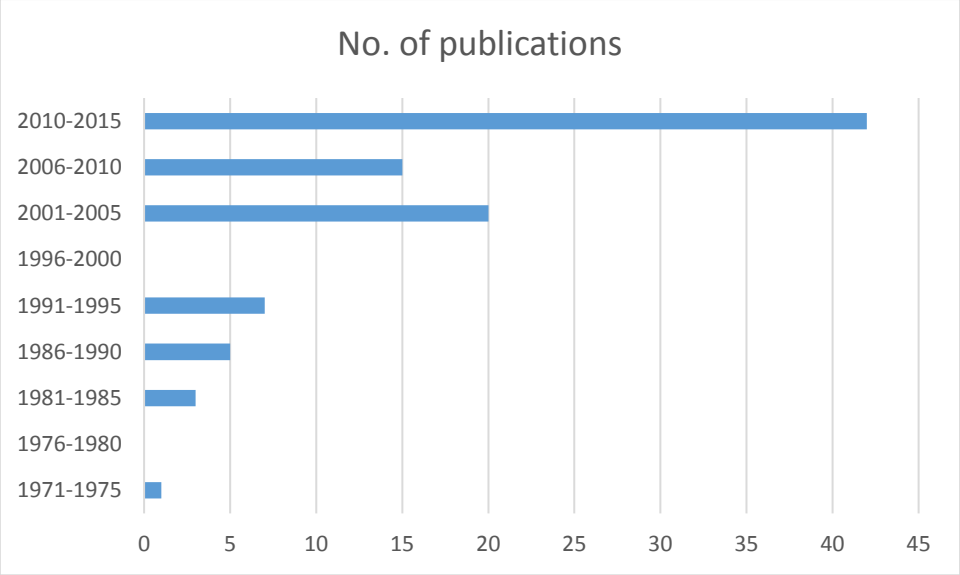


Figure 14. The Problem network, 1971-2015

The "Objection" network

We found 79 papers that use either "objection" or "objections" in their abstracts. The Objection network (see Figure 15) mainly relates to countervailing responses to given positions (e.g. objections to *presentism*). A quick survey of the papers shows that it also relates to *previously unanswered objections*, *responses to objections*, *freedom from objections*, *objections to premises*, and *justifications for objections* or *clarifications to objections.* Some papers include the term "objection" in their title, such as the *insularity objection*.

The "argument", "problem", and "objection" networks constitutes of coterie of mutually connected terms that have been increasingly mentioned in abstracts since 2000. A case could be made that using this language in a paper is, in part, a predictor of success in terms of being published in the journal.

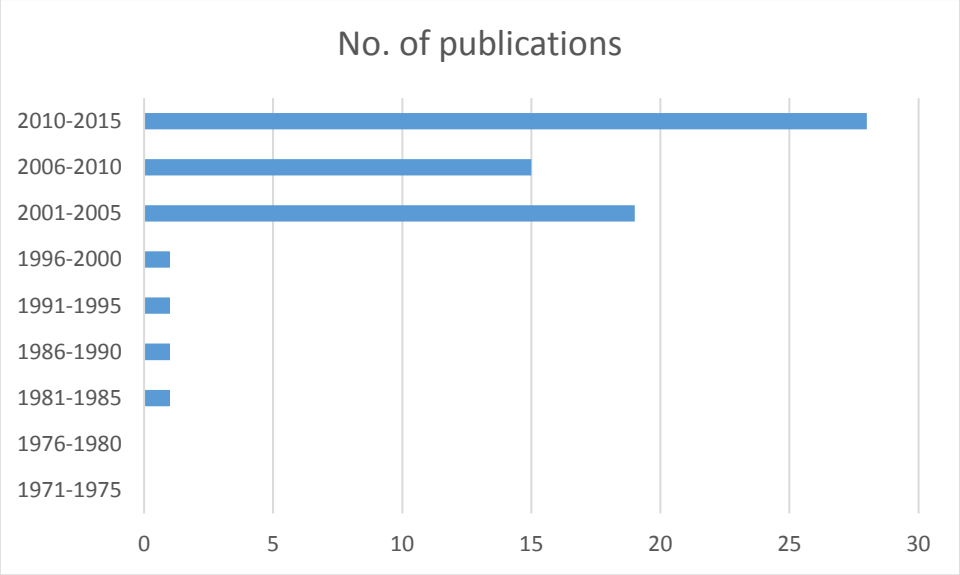


Figure 15. The Objection network, 1971-2015

Conclusion

This paper attempted a citation network analyses of available publication data of a key philosophical journal, the *Australasian Journal of Philosophy* as sourced from *Web of Science*, *Scopus* and *Philosopher's Index*. The paper outlined the most published and most cited philosophers in the journal and focused on the networks of philosophical concerns as visualised using *Kumu*© by using abstracts and keywords as sources. This revealed a number of networks that represent the most discussed topics throughout the history of the journal. Analysis reveals that the most discussed topics today are quite different from the inception of the journal in 1923. Idealist concerns have largely vanished from discussion. Gone too is any resemblance to the journal's previous interest in Psychology, previously seen as 'the proper introduction to Philosophy' [Passmore, in McLeod: 1963, pp. 145-6]. Neither is there any prevailing interest in post-modernist views or continental philosophy; the *AJP* remains staunchly a journal in the analytic tradition. The citation landscape of the journal reveals that, in the place of idealism, there is increasing specialisation in the fields of epistemology, logic and paradoxes, and moral philosophy (with a surprising emphasis on the latter), and a single-

minded preference for papers that use terminology relating to *arguments, problems* and *objections.* For better or worse, this is the *AJP* as it enters its second century as the pre-eminent antipodean journal in Philosophy.

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