Mapping the multidisciplinarity of the Arts & Humanities

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The Arts & Humanities include a diverse range of subjects, including many of the oldest intellectual pursuits such as Philosophy, Religion, Music, History, Art, Theatre and Literature. These disciplines, along with fields such as Language, Linguistics and the History of Science, share a common concern with humanity and culture.

This mutual interest means that we can expect much of the research in the Arts & Humanities to bridge disparate fields, in much the same way as modern scientific research increasingly links traditionally separate disciplines. One method for investigating this multidisciplinarity of research is to look at the citation links formed between journals when a paper published in one journal makes reference to a paper published in another. Citations are made to earlier work with some relevance to the current research, and so they can be used to draw together topically similar journals; see Research Trends issue 26 (1) for an earlier exploration of citation mapping using Scopus citation data. A similar approach applied to the Arts & Humanities reveals the structure of the subject area, and can also be used to highlight examples of multidisciplinarity.

The Arts & Humanities landscape

The Arts & Humanities as a subject area is only rarely the focus of bibliometric analyses, due to a common emphasis within the bibliometric community on citation analysis. These approaches tend to rely on sufficient quantities of journal articles and of citations to recent research. In the Arts & Humanities scholarly work is often published outside journals, for instance in monographs and books.

Our citation mapping method can be adapted to better suit the disciplines; for this map, we used ten years of publication and citation data (using the years 2001–10). This allows a greater period of time for citations to be made to previously-published work, and increases the confidence we can have in the structure of the graph, at the expense of having a map which does not reflect the most current trends. Otherwise, the method remains similar: citation data from Scopus are gathered at journal–journal level; these citations are first normalized and then used as the edge data for a network graph in Gephi. Citations from a journal to any other are normalized both by the total citations from the citing journal and the total citations to the cited journal within the time period: the L index defined by Calero Medina et al. (2). The map presented in Figure 1 is the result of mapping the journals classified within the Arts & Humanities in Scopus. All included journals published at least ten articles in the period of study (2001–10) and made at least ten citations to other journals in the map. After outliers and unconnected journals are removed, there remain 1570 journals which form the core of the decade’s Arts & Humanities work.

The map uses colors to highlight the position of the various subjects classed within the Arts & Humanities in Scopus; the major subjects have been labeled directly in Figure 1. These subjects group around Literature and the Arts in the center, with close connections to History to the right and Religious Studies and Philosophy to the left; and looser connections to Language & Linguistics at the top and Archaeology at the bottom.

When compared with a previous journal map of the Arts & Humanities produced by Leydesdorff et al. (3), similarities include the positioning of Literature between Music, Philosophy, Art and History; the proximity of Archaeology to History; and the connection between Linguistics and Philosophy. The maps are in broad agreement, despite differences in data source, normalization and layout algorithm; however, the visualization presented by Leydesdorff et al. shows Linguistics closer to the center of the map, and Theology as one key group of journals outside the core of the field. In the present map shown in Figure 1, Language & Linguistics are situated further from the center, while Religious Studies is shown to have strong ties not only to Philosophy but also to the Arts and History.

Mapping journal context

The curved lines reaching across Figure 1 represent citations from one journal to another and it follows that the long lines reaching from one discipline to another show those citations made to journals in a different field of research. While Figure 1 shows the many interconnections between subjects, we can focus on smaller subsets of the map to see how individual journals exemplify multidisciplinarity.

Journal of Memory and Language publishes articles that “contribute to the formulation of scientific issues and theories in the areas of memory, language comprehension and production, and cognitive processes.” (4) The journal sits within the Language & Linguistics subject of the map shown in Figure 1 and, as expected, many of the journals it has citation links with are in the same field.
Figure 1: Journal citation map covering 1570 journals from the Arts & Humanities. Journals are visualized using Gephi 0.8.1 beta and the ForceAtlas2 layout algorithm. Each node represents a journal and edges the citations from one journal to the other in the years 2001–10. Each subject is assigned a color, used to highlight journals belonging to a single subject within the Arts & Humanities according to the ASJC classification used by Scopus; journals in multiple subjects are shown in white. Source: Scopus.

Figure 2: Journal citation map covering 113 journals from the Arts & Humanities with a direct citation link to Journal of Memory and Language in the years 2001–10; selected journals are labeled. Source: Scopus.
However, the journal also has links with a broad range of journals in the field of Philosophy, as well as Literature and Music. Figure 2 shows only those journals with a direct link to the Journal of Memory and Language, and while the core of Language & Linguistics journals is immediately visible, the other related journals are shown at the right and bottom edges of the map; the links to a variety of Philosophy journals (turquoise) are particularly evident at the bottom-left (see previous page).

Three further journal maps illustrate the wide range of interdisciplinary links across the Arts & Humanities. Figures 3-5 show maps for Journal of Archaeological Science, Journal of the History of Ideas, and New Literary History, each of which are based in different subjects within the area: respectively Archaeology, History & Philosophy of Science, and Literature & Literary Theory (see Figure 1). Journal of Archaeological Science publishes work “advancing the development and application of scientific techniques and methodologies to all areas of archaeology.” (5) Figure 3 shows the predominately archaeological citation links of the journal, as well as the branches to such journals as Medical History and Oregon Historical Quarterly on the right side of the map, and Philosophy of the Social Sciences and Phenomenology and the Cognitive Sciences on the left. These do not dominate the map, but the Journal of Archaeological Science displays more multidisciplinarity than many other archaeology journals.

Journal of the History of Ideas describes its field of focus, intellectual history, “expansively and ecumenically, including the histories of philosophy, of literature and the arts, of the natural and social sciences, of religion, and of political thought.” (6) Figure 4 shows the journal at the center of a wide-reaching web of citations, touching upon Language and Literature at the top (Language Sciences, Poetics Today), Music and History to the right (Music Analysis, Historical Research), Religion at the bottom (Journal of Religion), and Philosophy to the left (Philosophical Quarterly). Rather than sitting within a specific field and reaching out to others, as is the case for most journals, the Journal of the History of Ideas covers a vast range of the subject area from a central location.

Figure 3: Journal citation map covering 135 journals from the Arts & Humanities with a direct citation link to Journal of Archaeological Science in the years 2001–10; selected journals are labeled. Source: Scopus.
New Literary History “focuses on questions of theory, method, interpretation, and literary history.” (7) Figure 5 shows the journal within a context of Literature & Literary Theory journals as well as those in Philosophy, History, Archaeology, and the other Arts it connects with (Philosophy East and West, Church History, Archival Science, Music and Letters) (see next page).

The four selected journals used for these maps lie in different fields of the Arts & Humanities and so show different scopes. However, even closely related journals can show very different reach when the citation relationships are analyzed. These citation maps are one method to look into the differences in scope and influence between journals.

What links the Journal of Archaeological Science to Oceanic Linguistics?
While the Journal of Archaeological Sciences is firmly placed in the archaeology section of the Arts & Humanities map, it reaches out to a diversity of journals including Oceanic Linguistics. What kind of paper causes these seemingly unusual links?

A 2010 paper authored by a group of researchers from France, the UK and New Zealand brings together the fields of Archaeology, Linguistics and even Genetics in a study of the settlement of the Solomon Islands. (8) Among its cited references are four earlier papers from Oceanic Linguistics, as well as articles published in Human Biology, the American Journal of Human Genetics and the Journal of Forensic Sciences.

Since publication, this paper has itself been cited in the Annual Review of Genetics, Current Anthropology, and Molecular Biology and Evolution, making it a true case of multiple fields interacting in the literature.
Conclusion

While interdisciplinary links such as those we have discussed are not to be found in all journals – many, often smaller, journals only have direct links to journals well-embedded in their own topic of interest – they are common across the Arts & Humanities and indeed science in general. The maps shown here were limited to Arts & Humanities journals, but if expanded to all scholarly journals we would see even more dramatic examples of multidisciplinarity: citations between disparate subject areas. Ideas from one field are often relevant to those working in another, and the four journals illustrated here are some of many which have an influence beyond defined subject boundaries. These visualizations of the citation links in the Arts & Humanities show that it is a collection of interrelated topics: different facets of an investigation of culture and humanity.

References:

7. http://www.press.jhu.edu/journals/new_literary_history/