Identifying Current Trends in Entrepreneurship Research: A New Approach

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Introduction

There are many reasons why it would be helpful to be able quickly to identify trends and growth points in a field like Entrepreneurship Research…other than a desire to identify and jump on any passing bandwagon! First, there may be opportunities to align research more closely to policy concerns, or to identify research opportunities that could underpin policy deliberations. (Vesper 1983; Gibb 1992; Gibbons, Limoges, Nowotny, Schwartzman, Scott & Trow 1994; Watkins & Stone 1999; Gibb 2000). Second, universities ideally structure teaching programmes to at least include discussion of current and emergent issues (Vesper & Gartner 1997; Watkins & Stone 1999; Albert & Watkins 2000; Katz 2003). Third, those already in the field have a duty incumbent upon them to guide young scholars towards topics which are likely to be fruitful – particularly when helping them choose a doctoral thesis topic (Veciana 1991; Bygrave 1994; Curran & Blackburn 2001). In addition, as Landström (2001) has shown, most contributors to the field can best be described as 'transient', and might be persuaded to do more research on entrepreneurship related topics if they had a deeper understanding of the context in which their research is embedded.

Some Limitations of Citation Based Approaches

The usual way to identify the 'leading edge' or 'research front' of a research field, other than by immersion and inspection, is to undertake some kind of bibliometric analysis. Pritchard (1969: 348) defines the purpose of this as: *"…to shed light on the processes of written communication and of the nature and course of development of a discipline (in so far as this is displayed through written communication), by means of counting and analyzing the various facets of written communication".*

White & McCain go on to say that: *"The fundamental unit of analysis in bibliometrics is published works, counted either as physical units, such as volumes, or intellectual units, such as titles; it may also be bibliographic entries or <u>citations that represent works</u>".* (White and McCain 1989: 121 – emphasis added). White and McCain have made their reputation in citation analysis[1], yet even they put citation analysis at the end of their list: for many purposes a citation as a representation of a work is intrinsically a less satisfying object and has less heuristic power than the work itself, if we can arrange to bring that work - or some substantial part of it - within the scope of analysis.[2]

In particular, for the purposes of the discussion here, citation analysis suffers from two main defects. First, citation involves intrinsic delay. To cite a work one must first be aware of it. This means it must have been 'published' in some form. This publication must then be delivered to the citing author, evaluated, utilised in progressing one's own work (or not…) and finally acknowledged in terms of inclusion in one's list of cited references. In some branches of natural science this whole cycle can be completed in a matter of weeks.

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[1] Specifically, in the development and deployment of a powerful technique known as Author Co-Citation Analysis (ACA). See: McCain (1986 & 1990) and also White & McCain (1997).

[2] This is not the place to dwell on the ontological status of a citation. Suffice it to say that although citation analysis 'works' for many purposes, there remains a deep concern among many bibliometricians that we still cannot specify *exactly* what it is that the act of citation signifies: that it means different things to different citing authors; that meanings may vary over time; that it may have different significance according to the discipline in question, and so on. For an introduction to the field see, for example: Cronin (1984) and Leydesdorff (1995 & 1998).

In the social sciences the process typically takes much longer. In particular, it can take several years from the submission of a paper to a leading management journal until it finally appears in print. As part of another study currently in progress we had occasion to analyse publication delays in one volume each of *Management Science* (1998, volume 44) and *Strategic Management Journal* (1998, volume 19). The research examined the difference between the submission date and the subsequent publication of the paper. Time lags were found of 35 and 34 months respectively between submission and publication.

In the case of the more sophisticated techniques for mapping disciplinary development in intellectual space, such as Document Co-Citation Analysis (DCA) or Author Co-Citation Analysis (ACA)[3], the situation is somewhat worse. DCA, for example, relies on the citation in the same paper of two *specific*, different prior works and then aggregates for analysis the number of times this citation pair occurs. White (1990) noted that it often takes at least two years for one published work to be cited by another. Clearly the conditions outlined above for the citing author have to be fulfilled for *both* items in the cited pair – which will likely introduce a further delay. Then we have to wait until a threshold number of co-citation events takes place.[4] Several more years are likely to elapse before the citing work passes into the data of a co-citation analysis. Finally, in order for us to complete and publish our analysis, our own paper would have to go through the same tortuous publication cycle. Thus a DCA drawing heavily on work published in a journal such as *SMJ* or *MS* and eventually published there or in another leading journal might refer to the intellectual structure at best

some six to eight years in the past.[5] The equivalent delays when publishing in leading entrepreneurship niche journals are now only slightly less. As such, an any co-citation analysis is best interpreted as an historical appreciation of the intellectual structure of a speciality.

However, in many ways the second drawback to citation analysis is of greater concern to us here. To mount any sort of citation analysis one first has to construct or obtain a citation *index*; that is, a listing of each primary source of interest together with the citations offered within every such item. In practice it is very rare for any citation analyst to construct such an index from scratch since this takes far longer than any likely analysis itself. In practice scholars almost invariably fall back upon the one generally available database, the *Social Science Citation Index,* published by the *Institute for Scientific Information* in Philadelphia.[6] Watkins & Reader (2003a) discuss the citation-based studies that have been attempted in entrepreneurship. In recent years only two of these - by Watkins and by Grégoire *et al.* - have been based on the construction of an original citation index rather than using *ISI* data (Watkins 1994 & 1995; Grégoire, Déry & Béchard 2001; Grégoire, Noël, Déry & Béchard 2004).

The *SSCI* is a wonderful and unique resource, but it suffers from two strong defects. First, it is heavily biased towards journals (and hence almost by default to individual papers) of US origin. Second, it has only limited coverage of the total population of available journals in any field or sub-field (Hicks 1999). Both are particular problems for the social sciences. Thus, in terms of Small Business / Entrepreneurship 'niche journals' (Watkins & Reader 2003b) it currently only fully indexes *Journal of Business Venturing*, *Small Business Economics* and *Journal of Small Business Management.* Any analysis based on *ISI* data will therefore be limited to a subset of the total

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[3] This is the technique adopted, for example, by Reader & Watkins (2001).

[4] Of course, for most possible pairs this *never* happens - even if the threshold is set at one - since there is no intellectual connection and the items are never co-cited: to take an extreme example, no work by either Watkins or Reader has ever been co-cited with any work of Einstein, or is ever likely to be! However, one dare not set the threshold too low or else very weak intellectual connections become difficult to differentiate from strong ones. For example, studies across a wide range of topics – even disciplines – may use related statistical tests and refer to the same standard statistical textbook but have no intellectual connection as to topic or purpose.

[5] ACA counts instead the co-citation of *any* documents originated by specific authors. It is therefore slightly less subject to concerns over timescales than DCA. Moreover, since any item from the published corpus of each author's work is entered into analysis the technique is - *ceteris paribus* - better suited to fields where the rate of publication per author is low.

[6] Many readers will have used this, perhaps unknowingly, as it is the database underlying the *ISI*'s *Web of Science* service.

available publications and have an inbuilt bias towards American interests. Although one might argue that this reflects US leadership in entrepreneurship research generally, a procedure which at least *started* by encompassing a geographically and culturally more broadly based data set would seem to be a more attractive option (Watkins 2003) - if a suitable data-set and appropriate analytical tools did indeed exist.

An Alternative Approach

As it happens, an alternative approach is now possible. First, there have been technical developments in approaches to textual analysis which enable us to move closer to White and McCain's (1989) recognition that: *"...the fundamental unit of analysis in bibliometrics is published works..."*. Second, the development – for quite different purposes – of the ARPENT Corpus of Entrepreneurship-related journal abstracts has presented us with a new source of data on which to apply these techniques.

Textual Analysis

At one level textual analysis has always been with us; it is what we do when deconstructing and analysing any incoming verbal or written communication. But at a more technical level the longest established relevant procedures are those to do with concordance construction. Originally – and long before the advent of electronic aids – biblical scholars produced aids to contemplation and sermon construction in which similar themes / keywords were brought together from different parts of the Bible and reproduced in their textual contexts. This is essentially string searching and sorting, so concordance software has been around since the early days of computing. Qualitative analysis tools such as NVivo take this a stage further, for example by introducing elements of cluster analysis, and are widely used in social sciences and the humanities. At the same time great strides have been made in data visualisation software. Recently these two trends have come together in programmes such as *RefViz*[7] (*Cf.* Pennock 2002). *"Here a sequence of word filters are used to eliminate terms in the database which do not*

discriminate document content, resulting in a filtered set and a topic word set whose members are highly predictive of content. These two word sets are then formed into a two dimensional matrix with matrix entries calculated as the conditional probability that a document will contain a word in a row given that it contains a word in a column. The matrix representation allows the resultant vectors to be utilized to interpret document contents." More simply, the programme performs textual analysis in order to cluster groups of bibliometric objects according to their proximity in intellectual space and displays them accordingly. Thus it behaves in a fashion analogous with appropriate *text* to the kinds of procedure which implement DCA or ACA using *citations*.[8]

There are of course differences. One is that with co-citation what is being analysed is the structure of a field as perceived by 'users' (the citers). With textual analysis it is a construction of the relationships in a field as demonstrated by the use of similar phraseology by 'providers' (authors) that is at the heart of the process. This has the weakness that it may include in the analysis a lot of work that is produced but may never be 'used' - in the sense of demonstrable impact as evidenced by being cited in the work of another. Clearly the use of such programmes does not eliminate the need for knowledge of a field or for the exercise of general scholarly judgement. However, there are two advantages. First, there is likely to be more data available since one is liberated from the constraints of *ISI* inclusion. Second, the 'clusters' which are deemed to represent the intellectual structure of the field can be generated as soon as an item is published – there is no inherent 'waiting period' as there is with citation based approaches.

The ARPENT Corpus as a Data Source

We have described previously (Watkins 2003; Watkins & Reader 2003b) the rationale behind the collection of abstracts from entrepreneurship niche journals as the basis of the third section of *Annual Review of Progress in Entrepreneurship Research*. This process was underway in parallel to our β–testing of the *RefViz* software. By happy co-incidence,

[8] For a recent technical overview of a variety of approaches, see: Chen (2003)

RefViz is designed to work with bibliographic data held in an *EndNote* database, which is what we were using to assemble and format the abstracts and other bibliographic materials for *ARPENT*. By chance we had the sort of corpus of textual material available which *RefViz* was designed to help interpret. It therefore seemed entirely logical to use this data as a test of the new software. In fact, since the database – the *ARPENT* Corpus for the years 2000 and 2001– is rather small, this was a 'hard' test of the usefulness of the programme.

The journals from which papers were abstracted are listed in Table 1. We have described this selection previously as constituting 'deep' content of entrepreneurship research (Watkins & Reader 2003a). The great advantage of this data set is that only three of the journals are included in the *ISI* database.

Others among the total of 13 include Indian, Singaporean, German language and French language journals, in addition to English language journals which publish mainly work of European origin. There is therefore a 'balance' in the data set that would arguably be absent from one which was drawn exclusively from the *ISI* list. The unfortunate and admitted corollary is that these journals are not as influential in terms of citations offered – or by definition they would appear on the *ISI* list. Although within this extended context north American-based scholars still predominate, extending the journal coverage means they are joined by researchers from Europe and Australasia. Thus members of the group having five or more entries - Dana, Freel, Hisrich, Shepherd, Westhead, Wright (M) and Zacharakis – are representative of a variety of nationalities and work locations.

Table 1
Journals Included in the *ARPENT* Corpus as Representative of Entrepreneurship Research in 2000 and 2001

1. *Entrepreneurship and Regional Development*
2. *Entrepreneurship Theory and Practice*
3. *Family Business Review*
4. *International Small Business Journal*
5. *Internationales Gewerbearchiv: Zeitschrift für Klein- und Mittelunternehmen*
6. *Journal of Business Venturing,*
7. *Journal of Enterprising Culture*
8. *Journal of Entrepreneurship*
9. *Journal of Small Business and Enterprise Development*
10. *Journal of Small Business Management*
11. *Revue de l'Entrepreneuriat*
12. *Small Business Economics*
13. *Venture Capital: an International Journal*

Method

A text corpus of 521 *Items* was prepared. An 'Item' here is defined as the *Title* of the relevant article taken together with its accompanying *Abstract*. This contained more than 450,000 significant characters comprising approximately 80,000 words. There were just over 1000 instances of authorship, with only 17 people making four or more contributions to the literature during the two year period from 2000 to 2001. *RefViz* was used to analyse this corpus by: creating a concordance of the corpus (that is, structuring the text in terms of proximity of words to one another); determining a 'keyword' list; creating a co-occurrence matrix; determining the intellectual proximity of keywords to each other; and, identifying clusters by sets of keywords.

Editing down the Keywords until few singleton Items remained resulted in a visual representation of 22 clusters. These are shown in Table 2.

Results

Table 2
Clusters Identified in RefViz Analysis

Cluster	Number	Keywords
0	14	Family; practice; culture
1	1	Attitude; equity; financial
2	12	Size; sector; structure
3	1	Industrial; location; survival
4	3	Finance; fund; access
5	71	Entrepreneur*; model; process
6	58	Development; economic; network
7	28	Entrepreneurs/ship; start; empirical
8	14	Human resource; medium-sized; performance
9	23	Strategic; strategy; performance
10	11	Industry; sector; capital
11	68	Market; strategy; performance
12	26	Performance; entrepreneurial; process
13	1	Behaviour; framework; trust
14	4	Family; succession; process
15	33	Factor; success; successful
16	55	Growth; development; economic
17	28	Family; strategic; process
18	41	Capital; venture; investment
19	11	SMEs; lack; manufacture
20	5	Managerial; agency; innovation
21	13	Entrepreneurship; field; future

These can be visualised as in Figure 1, which groups together the clusters which are closest together in terms of the textual composition of their constituent Items. This is taken to be a representation of their relative positions in intellectual space.

Some examples will show how this analysis can aid our understanding of important themes in the literature. For example, Family (N=46) clusters in three ways.

> # 0. {Family: Practice: Culture}
> #14. {Family: Succession: Process}
> #17. {Family: Strategic: Process}

These appear close together in Figure 1. This is not in itself an unexpected result. However, the relative size of the clusters is interesting. Cluster #0 contains 14 cases and cluster #17 28 cases, whereas cluster #14 has only four. It appears that 'succession' is no longer as major an issue in family business research as

strategic process and cultural issues. Or perhaps by balancing American work with that from a wider international reach we are also balancing a consulting orientation with one more focussed on academic understanding?

However, if we look at the clusters which relate to financial issues (for root Financ* and Capital, N=45), although we find three (#1, #4 and #18), there appears to be a large, relatively undifferentiated body of research in which few specific issues seem to attract consistent research that can be identified in terms of tight, specific clusters.

> # 1. {Attitude: Equity: Financ*}
> # 4. {Financ*: Fund: Access}
> #18. {Capital: Venture: Investment}

Of course, it is possible that the software does not have the power to discriminate well enough, or that the data set is too small, or that the 45 Items clustering to {Financ* + Capital}

should be extracted and analysed separately in more detail. To resolve this issue we could examine this cluster in more detail, but it is relatively large and space is limited, so consider instead cluster #21 which with 13 contributing Items is a more manageable size. This cluster is generated by the Keywords {Entrepreneurship – Field – Future} and is detailed in Table 3.

Table 3
Cluster #21 {Entrepreneurship – Field – Future} N = 13

1.	Editor's Introduction: Low and MacMillan Ten Years On: Achievements and Future Directions for Entrepreneurship Research
2.	Trends in the market for entrepreneurship faculty, 1989-1998
3.	Gründungsforschung und Unternehmerausbildung an Hochschulen (Entrepreneurship research and education at university level in Germany)
4.	The theoretical side of teaching entrepreneurship
5.	Levels of analysis in entrepreneurship research: Current research practice and suggestions for the future
6.	Blickpunkt Gründungsforschung - Bericht aus Deutschland (Research into start-ups in Germany)
7.	Horatio Alger meets the mobility tables
8.	Zielt unsere Forschung in die richtige Richtung? Der Einfluss der Konzeptualisierung des Unternehmertums auf das Forschungsdesign (Do we Research the Right Things? How the Conceptualization of Entrepreneurship Affects Research Design)
9.	Defining the field of research in entrepreneurship
10.	Seminar on research perspectives in entrepreneurship
11.	The adolescence of entrepreneurship research: Specification of purpose
12.	Entrepreneurship in Pacific Asia - Past Present and Future
13.	Entrepreneuriat: Modélisation du phénomène

Inspection of Table 3 seems to indicate that the technique is working. Apart from the word 'Entrepreneurship' itself, which naturally appears in very many Items (Title + Abstract) in the Corpus, the terms 'Field' and 'Future' appear in few of the titles but have been extracted from the abstract text to generate a relatively coherent cluster. This is true even though four of the constituent Items were originated in a language other than English, the common analytical tongue, and are represented here in translation.

Other Kinds of Analysis

Over and above the clustering described above, the *ARPENT* Corpus can be searched for common features, such as author frequencies (as discussed briefly above) and for 'presumed' growth points. To demonstrate the latter, the authors asked colleagues and research students with an interest in Entrepreneurship to identify a few topics they thought would appear frequently, or hoped to see the field addressing. The search terms suggested were: {Grow*}, {Wealth}, {Trust}, {Agency - in the context of Agency Theory}, {Network - in the context of Women Entrepreneurs}, {RBV + Resource-based}, {Social Ent*} and {Psycholog*}. The results were quite surprising.

*Grow** appeared 132 times, but *Decline + Shrink* together only six times, and *Fail** only 28 times – all out of a possible 521 Items. The question thus arises: to what extent can we really hope to understand growth and success without contextualising it by also studying failure?

Wealth creation is often claimed to be a key role of entrepreneurs, although terms such as 'value creator' may be more politically acceptable and in wider use. Nevertheless it

seems strange that among a group of researchers who might be expected to have sympathy for this entrepreneurial role, the term *wealth* appeared only ten times in 521.

Indeed, most of the suggestions generated very low frequencies: *Trust* = 12 / 521; *Agency* = 13 / 521;
RBV + Resource-based = 9 / 521; *Social Ent** = 0 / 521; *Psycholog** = 9 / 521.

Finally, although *Network* appeared 46 times in 521, only in one case was this in the search context of women entrepreneurs.

Conclusions and Next Steps

Perhaps the most important conclusion to date is that the use of textual analysis software *does* allow clustering which, by and large, seems to accord with the expectations of those in the field. This is a technique which a brief pilot study covering (but not differentiating between) just two years has shown to have promise. Because of the nature of the data, the clusters generated have somewhat more currency than those produced using citation-based approaches (although, as noted above, the ontology is different: we are using producer-oriented data not user-oriented data). Few if any of the clusters appears to be unexpected, but on the other hand, it is more difficult than expected to find clusters dealing specifically with issues which might have been expected – such as *Succession Planning*. There was a cluster corresponding to the latter interest, but it was smaller than might have been expected. Of course, clusters can only emerge if there is a minimum output concerned with a particular topic as evidenced in each Item introduced into the analysis. The incidence of work in some areas that have been extremely fashionable in the past – such as *Entrepreneurial Psychology* – or seem to be in vogue now – such as *Social Enterprise* or *Networking among Female Entrepreneurs* – was much lower than anticipated. It was also quite easy to identify paradoxical imbalances in the attention of scholars, such as a concentration on *Growth* and success, but some reluctance to examine *Decline* or outright *Failure*.

The *ARPENT* Corpus as it existed when this analysis was undertaken was not designed to be input into textual analysis programmes. Also, it covered only the years 2000 and 2001. The analysis did not attempt to differentiate between these years and there is no intrinsic reason why this particular time period should be of special interest. Moreover, the analysis was static rather than dynamic since it would be difficult on the basis of such a small number of Items - and only two years of data - to argue that changes from year to year were more than random fluctuations. Since then the Corpus has been extended to include 2002 and 2003, and processing of materials produced in 2004 is being undertaken as these become available. Moreover, the range of journals abstracted into the Corpus has been extended and will be adjusted again so that coverage will rise to above 300 Items per year. The demographic data collected with each Item is also being enhanced so that questions of individual and institutional productivity and research focus over time can be addressed.

Thus we will shortly have five years of data and it will be possible to begin answering the questions introduced at the beginning of the paper concerning Trends and Growth Points in the field.[9] The indications are that the kind of analysis undertaken does raise interesting issues for scholars in the field or those considering entering it. The outputs may or may not be confirmed at a later date by reference to citation-based pictures of the intellectual structure of the field, but we would argue that they have a value of their own *pro tem*.

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[9] The intention is to present this analysis in *Annual Review of Progress in Entrepreneurship Research Volume 3, 2004* and to periodically update it over time.

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Figure 1: 'Intellectual Structure' of Entrepreneurship Research in 2000-2001