

Intercultural relations: A bibliometric survey

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ABSTRACT

This study provides an analysis for the development of the intercultural relations (IR) discipline by using the references of the highest cited IR records in Thompson Reuter's Web of Science (WoS) database. Using comprehensive searching and manual coding, a highly specific dataset representing the IR discipline is constructed and described. In terms of authors, citations to John Berry's and Colleen Ward's works are on the rise while citations to William Gudykunst and Richard Brislin are declining. The *International Journal of Intercultural Relations* (IJIR) is found to be the most cited journal in the past 30 years. The classic texts such as *Culture's Consequences* (Hofstede, 1980, 2001) and *Beyond Culture* (Hall, 1976) are still highly cited in the field after many decades. Psychology, communication, and sociology are found to be highly influential disciplines. Psychology continues to contribute the majority of references. References are decreasing in the field of communication and increasing in the fields of medicine and business. The trend of this change over time is quantified and shown to be statistically significant. The analysis also shows that the top six influential disciplines are psychology, business, the biomedical sciences, sociology, communication and anthropology. The groups studied in the top cited articles in WoS are biased toward those in the United States. Lastly, this study uses co-citation analysis to show that IR publications bridge multiple disciplines as expected for this interdisciplinary field. The caveats of this type of bibliometric study on a field such as IR are discussed, and plans for more comprehensive approaches are developed.

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1. Introduction

The scientific study of scholarly citations can serve as a reference for both developing and mature disciplines by revealing the trends in research topics, influential authors, publication outlets and classic works. Although citation analysis has limitations, many consider it to be a reasonable measure of intellectual influence. While there may be other reasons for authors to cite works, it has been shown that citations correlate with the importance a work has in its field. Therefore, a careful analysis of the citations contained in a body of literature can show which works and authors have influenced the development and progress of a field.

The purpose of this study is first to identify highly cited subset of the literature of intercultural relations that would otherwise be impossible to identify with simple searching. Second, the study provides a bibliometric overview of the field of intercultural relations including its major publications, core researchers and influential journals. Using bibliometric

Abbreviations: IR, intercultural relations; WoS, Web of Science; IJIR, International Journal of Intercultural Relations; SR, source records; CR, cited references; SC, subject categories; TC, total citations; ISI, Institute of Scientific Information.

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approaches with data from Thompson Reuters Web of Science (WoS) 1980–2010, the most influential authors, journals, works, and subjects over time are identified and discussed.

The field of intercultural relations (IR) is particularly in need of this type of bibliometric self-assessment. IR is an interdisciplinary field that lacks the traditional boundaries of most disciplines, thus making it difficult to generate a representative pool of publications for bibliometric analysis. Furthermore, it has been over 10 years since any similar analysis has been undertaken of this field and considerable publication growth has occurred during that time. This study provides an updated analysis of the field of intercultural relations showing the changes in its leading researchers and focus over time, enabling current scholars to better understand the field and guide its future evolution. Moreover, the dataset collected for this study is obtained through comprehensive searching, manual coding and data cleaning. Thus these methods may be valuable to those interested in doing similar bibliometric analysis in other disciplines. In addition, the dataset may serve as a resource for further analysis of the contents, trends, and scope of the IR field using other methods such as network or lexical analysis.

1.1. Definition of intercultural relations

The beginning of academic interest in understanding how people of different cultural backgrounds interact is often traced back to the anthropologist Edward T. Hall's pioneer works in the 1960s (Casmir & Asuncion-Lande, 1990; Leeds-Hurwitz, 1990; Moon, 1996). Various terms have been used to describe studies of this kind, e.g. cultural anthropology, cross-cultural psychology, intercultural communication, multicultural education, cross-cultural management and training, etc. There are certainly differences in focus, perception, and methodology among them, but what unites them into one field is the focus on interactions of people at the interface of cultures (Hart, 1999; Landis & Wasilewski, 1999). Thus, in this paper, intercultural relations are used as the encompassing term to define this field.

1.2. Previous reviews of IR

Various prior efforts have been made to try to qualitatively and/or quantitatively capture the development of the field of intercultural relations.

One approach has been to chart the discipline's development through reflections on historical events and documents. The widely cited Leeds-Hurwitz's (1990) article about Edward T. Hall, the father of the field, and his legacy is a good example. It documents the development of intercultural communication as a field through the context of Hall's work at the Foreign Service Institute and his publications. Another example is Rogers, Hart, and Miike's (2002) article, which reviews how Hall's pioneering books set up paradigms for the field in both the U.S. and Japan. These types of historical accounts offer an understanding of how and why the IR field has been shaped into what it is today. These historical reviews, while illustrating the development of an academic field outside of its scholarly publications, are relatively narrow in scope and focus.

Conceptual or thematic mapping of the IR field is another approach. For example Kim is a senior and renowned researcher in the field of intercultural communication. Her chapter in the 2000 Communication Yearbook draws on her life experiences in this research domain and gives a comprehensive overview that defines the boundaries and summarizes the themes of this field. Another example is Kulich (2003) chapter, which illustrates an extended view of the field based on his observations and awareness of intercultural programs and resources in various disciplines. Such reviews can cover a wide range of research activities (e.g. associations, conferences, and institutions), thus providing a picture of the academic community as a whole. These valuable syncretical analyses arise from years of research in this field. However, they unavoidably include individual visions, interests, and agendas.

Survey methods overcome limitations of historical accounts or conceptual mappings by providing a broader range and a balance between subjectivity and objectivity. Harman and Briggs (1991) and Fantini's (1997) studies are surveys of scholars and teachers in the IR field. Respectively, the two studies sum the perspectives of professional association members of SIETAR (the Society for Intercultural Education, Training, and Research) and curriculum designers in an attempt to sketch the field. The results, however, are of a descriptive nature and prone to the limitations of all surveys.

The bibliometric mapping of scientific fields complements the above mentioned approaches with an analytical approach. General publication indexes provide valuable indicators that can help quantify the growth, trends, output, and influence of scientific fields at multiple levels (e.g. article, journal, and discipline). Analysis of cited references (CRs) can uncover connections and trends that may not be easily visible or identifiable using other methods, such as identifying the impact and relatedness of journals. For example, citation linkages have been used to identify the role of a journal as bridging two otherwise separate fields (Feeley, Smith, Moon, & Anker, 2010). Bibliometrics can also incorporate the measurement of other features beyond citations. Content analysis on the frequency of textual markers can reveal trends in terminology and scholarly culture (Barley, Gordon, & Gash, 1988). The primary limitation of bibliometric mapping is that the analysis can only be as good as the quality of the datasets, which are subject to database coverage bias (e.g. the depth and breadth of journals, disciplinary focus, time range, etc.) and human errors in input (Leydesdorff, 2008). Moreover, the common practice of using citation counts as a proxy for academic influence is questionable. There is no doubt that many citations are created not because they represent the best evidence, but are included for political, personal, historical or other reasons (Bornmann & Daniel, 2008). Nevertheless, citation analysis is widely used to study scholarly productivity, influence, and map scientific fields.

There have been several studies that mapped related fields close to IR, such as cross-cultural psychology (Cretchley, Rooney, & Gallois, 2010), and communication (Feeley, 2008). However, in intercultural relations, such bibliometric attempts to describe this field in a quantitative manner have been undertaken by just one scholar. Using publication data from the flagship journal, the *International Journal of Intercultural Relation*, Hart (1999) estimated the most influential IR scholars, journals, and books. Using citation analysis with the references in this journal, Hart describes the influence of psychology, sociology and anthropology, and names William Gudykunst and Harry Triandis as highly cited authors. Unfortunately, relying on data from one single journal, Hart's findings may be limited by the focus, editorial choices, and history of the journal. Furthermore, this study was published 10 years ago, with a dataset only including records up to 15 years ago. With the rapid growth of scientific literature it is past time for a new, comprehensive mapping of the field.

1.3. Research questions

Academic publications and citations have increased exponentially in recent years (Larsen & Ins, 2010) and the development of online journal databases and other information and communication technologies have made international and interdisciplinary collaborations more feasible and more common. These advancements provide an unprecedented opportunity to graph the development of the discipline and see its relations with other fields of study. In addition, with the maturation of the field, IR might have developed major research paradigms that can be validated using bibliometric and content analysis. In this paper, the overall rationale is that IR, following Kuhn (1996) terminology, is entering the stage of a normal science with representative authors and works, core publication outlets, and concentrated research themes after its rapid expansion and development in the past 30 years. The assumption is that the highly and widely cited authors, journals, and works over time are the indicators of the dominant traditions of the field.

Specifically, there are three research questions that this study is designed to explore:

RQ1: What are the characteristics of the IR field based on its publication data?

RQ1.1: Who are the highly cited authors?

RQ1.2: What are the highly cited journals?

RQ1.3: What are the highly cited works?

RQ1.4: What are the general trends of the indicators in the previous three subquestions?

RQ2: What is the disciplinary composition of IR research? How has it changed over time?

RQ3: Which cultural groups are studied most?

The study covers a broad range of publications in the IR field to show how this field has developed, what work has become more/less influential, and which journals and authors are the most consulted within the field. The coverage of IR literature is not confined to one journal, but instead is a comprehensive set obtained from WoS using careful search and coding strategies. The year range covered is wider and more recent from 1980 to 2010 compared to Hart's (1999). The interdisciplinarity of IR is demonstrated by the distribution of subject categories and the connections are further explored in a co-citation analysis. Still, it must be made clear that this dataset has its own limitations: it is constrained by the coverage of WoS and high citations tend to be associated with older, more established works.

The following bibliometric indicators are used to provide specific answers to the research questions.

- ranking of top cited authors in source records;
- ranking of journals publishing IR articles;
- breakdown of subject categories assigned to journals publishing or cited by IR research;
- ranking of top cited works;
- interdisciplinary mapping of cited references; and
- ranking of cultures studied in source records.

2. Method

This study uses a dataset developed through searching strategies, careful data cleaning and coding. The process is explained in detail in the following subsections.

2.1. Data collection

Four steps are taken to obtain a comprehensive set of IR articles from WoS:

- (1) Search Web of Science 1980–2010 to obtain a set of IR records with high recall (maximum number of relevant records retrieved).
- (2) Develop a reference list of important scholars and journals based on previous reviews of the IR field and then use it to verify that search results are comprehensive.

- (3) Manually code a portion (95%) of the top cited records to obtain a final set with high precision (minimal non-relevant records retrieved) as the final set for analysis.
- (4) Partition and clean both source and cited reference data.

2.1.1. Comprehensive search of intercultural relations in WoS

In order to obtain a comprehensive dataset of IR, WoS was searched for an overbroad set of results that would later be manually coded to obtain a precise and complete set of results of the IR field.

Search terms were drawn from the literature of IR. Based on Kim's definition of IR, the search strategy was a two part compound search combining two concepts. The first concept is that of culture, while the second requires direct interaction or communication between cultures. This definition excludes purely cross-cultural comparisons, however because records use the same terms for cross-cultural as well as intercultural relations, manual coding is required to filter out these references.

Additional terms were added from Kim's comprehensive review of the major themes of intercultural communications research (2000). These were used to expand the search such that specific topics would not be missed in the general search. The final search was:

ts=((cross-cultur* AND (interact* OR (training AND education))) OR (trans-cultur* AND interact*) OR (multicultur* AND interact*) OR ("cross cultural" AND interact*) OR Intercultur* OR interracial OR interethnic OR intergroup OR ("across cultures" AND interact*) OR (multinational AND cultural) OR bicultur*) AND ts=(Communicat* OR integration OR (adjustment AND cultur*) OR assimilate* OR acculturat* OR sojourner* OR expatriate* OR (cross-cultur* AND (competen* OR (training AND education))))

The final search resulted in the retrieval of 2977 (searched on 10/11/2011) records in the 1980–2010 WoS. ~2000 had been cited at least once in WoS. On inspection of these 3000 records, 60% were the desired IR records, and 40% were extraneous cross-cultural results.

The results were checked against a reference list of journals and authors known in the IR field through the analysis of review articles assembled by one author. The results contained 98% of these records on the reference list. This was deemed to be adequate recall and precision was deemed acceptable with manual coding of the search results.

The results were sorted by the number of times cited (TC). In order to obtain comprehensive coverage of the most highly cited papers, the top 95% of records by citedness were chosen to be included in the dataset. This resulted in 1300 records out of 2977.

2.1.2. Coding

Manual coding was used to filter out retrieved records that were not about IR based on their abstracts, titles and keywords. Binary codes (1 or 0) were used in the first trial coding of the top 200-cited articles in the dataset. The classic definition of IR, interaction among individuals or groups who do not share a culture (Kim, 2000; Gudykunst, 2002; Rogers & Hart, 2002), provided two ground rules of coding in or out:

- (1) *There must be at least two different "cultures"*. Culture is operationalized to mean differences in nation, ethnicity, race, gender, sexual orientation, geographic area, or physical (dis)ability as Kim (2000) summarized in her review of this field.
- (2) *There must be some kind of "interaction" between people from different cultures.*
- (3) The interaction is *interpersonal* and NOT *mass media communication*. A decision was made to include *computer-mediated* interpersonal communication because it has become an important means for communication across cultures in addition to face-to-face interactions (Barnett & Lee, 2002).

If an article met all three conditions, it was scored "1", if not, it was scored "0". Although seemingly straightforward, these criteria were not always easy to follow. Therefore, another two rounds of coding trials were done and further rules were developed so as to enhance inter-coder reliability to above 95%.

- (1) When there is not enough information for categorization given in abstracts, titles or keywords, the study shall be coded out ("0").
- (2) When a study gives ambiguous descriptions about whether two culturally distinct groups interact among themselves or with each other, it shall be coded "2" for further consultation between coders.
- (3) When a study focuses on interactions between "ingroups" and "outgroups" but without specifying the grouping variables, it shall be coded out ("0").
- (4) When a study is not about intercultural interaction per se, but clearly treats the intercultural interactions as independent or dependent variables (e.g. the relationship between acculturation levels of Hispanic youth and their substance use), it shall be coded in ("1").

With the refined rules of coding, a satisfactory level of reliability was achieved (Joint Probability of Agreement = .96, Kappa = .92) in the third round of trials. For the top 400-cited retrieved records covered in these three trials, the two coders agreed upon every code after consultation. Thus, it was decided that the remaining 900 records would be coded separately

except for those coded by a “2”. On average, coding was completed at the rate of ~100 records per man-hour. Among all 1300 records, 770 source records were coded in and served as the dataset for this study.

The cultures studied in each record were coded by country name. While the dataset included studies on the expanded definition of culture above, for the purpose of studying geographic bias it was decided to code based on countries to make the analysis meaningful compared to migration data.

2.1.3. Data cleaning

Bibliographic records retrieved from online databases often contain misspellings or inconsistency problems in the fields of author names, journal titles, and abbreviations in citations. Therefore, both source records and the top cited references (including total and temporal breakdowns) were manually checked. Authors sharing the same last name and one other initial were located in the original records to see whether they published in the same time period and/or same journals and/or similar subject areas. If so, they were assumed to be the same author and their records were combined. For example, authors “Gudykunst, WB” and “Gudykunst, W” were found to publish mainly in the time period of the 1990s–2000s, in communication journals, and on similar subject such as uncertainty avoidance and intercultural theory. Therefore they were assumed to be the same author.

Similarly, journal titles that were abbreviated differently were compared and subsequently combined if they represented the same journal. For example, the *International Journal of Intercultural Relations* is abbreviated as either *Int J Intercult Rel* or *Int J Intercultural* and thus these citations were combined.

Records of cited references were also verified and combined when different editions or reprints of the same books were cited. For example, two editions (1980, 2001) of Hofstede’s *Culture’s Consequences* were found in the dataset. Although they differ to a certain extent, the overall influence of such monographs is considered to be better represented by combining all editions rather than considering the influence of each separately. In a similar way, edited books were manually checked so that chapters from the same source were combined and counted as part of the edited books.

WoS states that its “subject categories (SC)... have been established over time by the Editors responsible for the various subject areas of the database” (Tool). Therefore, it was decided to use WoS SC to label the journals which appeared in the cited references of this dataset. 52% of 41,088 were matched to a WoS journal and thus given an SC. If WoS assigned more than one SC to a journal, only the first subject was used, as this was the subject that WoS deemed best described the journal. Only those records from journals covered by WoS were included in the final analysis of subject categories. The issue of sub-fields of commonly recognized disciplines was also encountered. For example, Geriatrics and Gerontology and Pediatrics are both subfields of the biomedical sciences, but are categorized on the same subject level as communication and psychology. Treating each subfield separately from its parent field results in sparsely distributed records and gives a biased advantage to other disciplines in comparison. Therefore, WoS SC were mapped to a set of broad subjects representing commonly recognized disciplines at approximately the same level of granularity. These broad subjects are henceforth called Major Subject Categories.

2.2. Data analysis

2.2.1. Co-citation analysis

Cited references were deduplicated and compared to their citing records to generate a directed adjacency matrix. The matrix, sized 770 by 4437 was multiplied by its transpose to generate the 4437 by 4437 co-citation matrix. This network graph was visualized using Gephi 0.8 beta, and the OpenOrd layout was applied to map the strength of co-citation to visual distance. In other words, each node represents a cited reference which has the attributes of subject category and each tie represents a connection between the two cited references with a strength of how many times they appear together.

2.2.2. Statistical analysis

Trends in change of proportion over time in both top-cited authors and subject areas were analyzed for significance using chi-square analysis.

3. Results

3.1. Highly cited authors/journals/works

A total of 770 highly cited IR source records, with 41,088 cited references, were found. The cited references of the source records were analyzed to determine the influence of authors, journals, subjects, and works within the IR field itself. The citing records were separated by publication year into 5 groups, from the 1980 to 2010, to provide a sense of how the field has evolved over time. All records of the 80s were lumped together because of their small number. The rest were binned into 5-year periods.

The top 30 authors during the full 30 year-period studied were analyzed. The full list can be found in the supplementary data. The majority of authors are from departments of psychology (16 out of 30), followed by communication (5) and business (4). 19 out of the 30 authors are from the United States, 4 are from Canada, 2 are from Australia and England, respectively, and there was one each from New Zealand and the Netherlands. Within the top 10 authors, John Berry is the highest cited

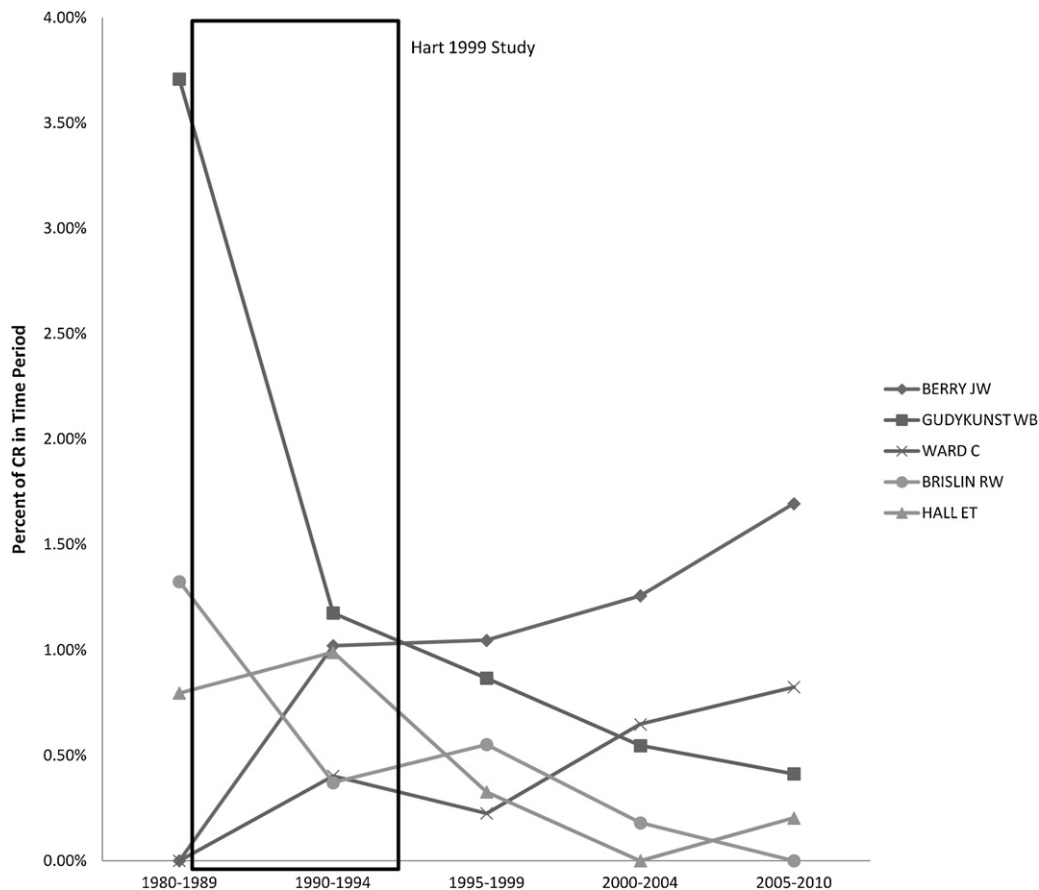


Fig. 1. Trend of author influence over time. The proportion of cited references in each time period for five of the top cited authors. The period covered in Hart's 1999 study is shown in the highlighted box. Notice in particular the decline of the influence of Gudykunst's work since the Hart study and the rise in influence of Berry and Ward.

author and has almost twice the citedness as the next most cited author. Gudykunst WB (2nd) is the only communication scholar, Black JS (3rd) is the only author from the business field and Hall ET is the only anthropologist.

A further Chi-square analysis was conducted to detect authors whose influence on the field of IR (measured by citedness in five time segments) has changed dramatically ($p < .05$). Both Ruben BD and Hammer MR have not been cited since 2000, so they are not included in Fig. 1. Based on the significance of the difference, the top five authors were graphed in Fig. 1. The relative positions of Gudykunst WB, Brislin RW, Hall ET, and Berry JW from the 1980s to early 1990s validated Hart (1999)'s list of top-cited authors. Taking a longitudinal look at the data, it is clear that the work of both Gudykunst WB and Brislin RW are less influential in recent years. The influence of work by Hall ET, the founding father, is also declining over the years, but there is also a recent increase in citedness from 2005. Berry JW and Ward C are two authors whose influence is steadily on the rise since the 1980s.

In terms of journals, the results clearly show the great impact of IJIR in particular (ranked 1st) and journals from the field of psychology (16 out of 30) in this dataset. Business and economics journals are the second largest group in the dataset with a proportion of 20%. Communication journals made up the least cited field, which may be indicative of the WoS coverage bias detected early in the process of checking comprehensiveness of search using the journal reference list. WoS does neither include a wide range of communication journals nor does it cover them in consistent depth. The major change compared to Hart's (1999) list is that three business journals are represented in the top 10, which indicates an increasing involvement of this discipline in the field of IR.

The most cited journals over time are shown in Fig. 2. The *International Journal of Intercultural Relations* is still the top cited, but its overall percentage of citedness among cited references is declining over the years. The *Journal of Personality and Social Psychology*, the *Journal of Cross-Cultural Psychology*, and the *Journal of International Business Studies* are cited more frequently since the '80s.

Of the top 30 cited works, half are journal articles and the other half are texts or book chapters. Among the top ten, three are edited texts (*Handbook of Intercultural Training*, vol. 1/2/3; *Handbook of Cross-Cultural Psychology*; and *Theories in Intercultural Communication*), which cover three major research areas in the IR field. *Culture's Consequences* (1980), *The Nature of Prejudice* (1954), and *Beyond Culture* (1976) are the three classic monographs that remain highly cited.

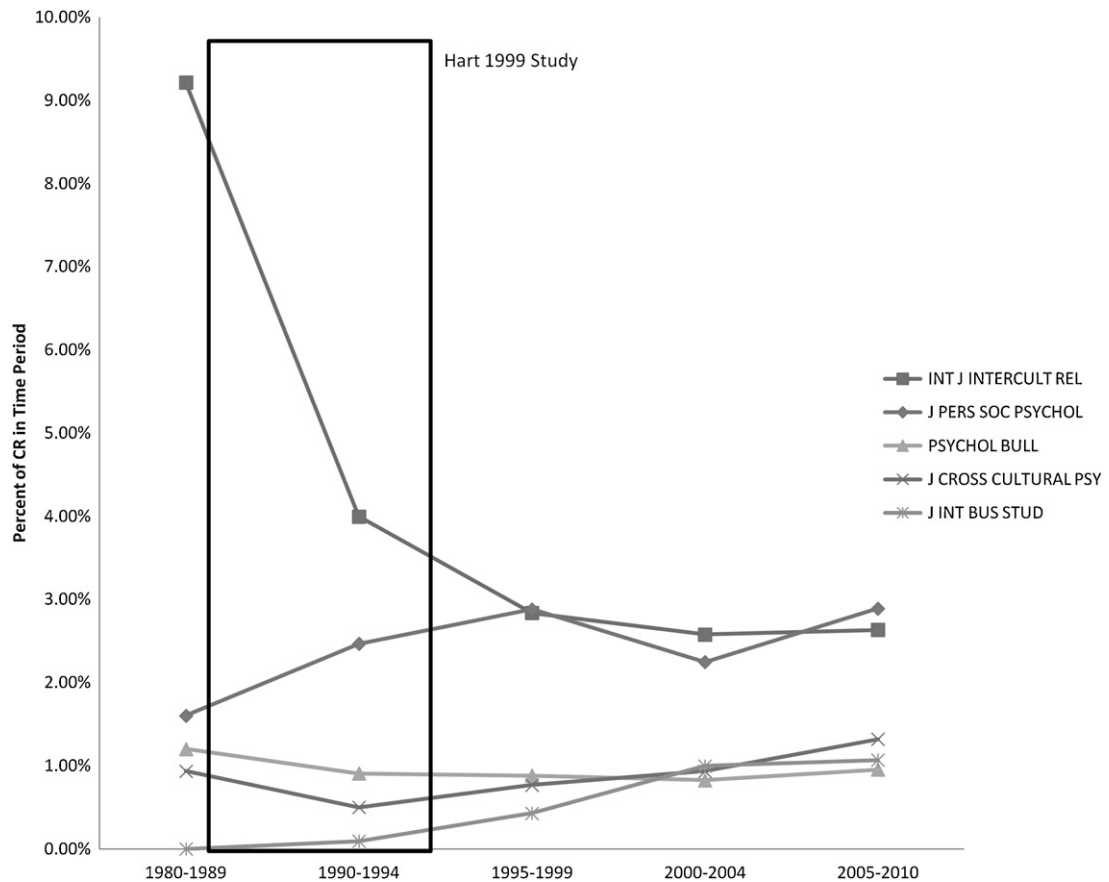


Fig. 2. Trend of journal influence over time. The proportion of cited references by each journal for several highly cited journals over time. Notice that while IJIR declines in total proportion, it still remains the most cited journal.

The major research theme reflected in the cited articles is acculturation and adjustment. The three major traditions in studying acculturation: stress-coping, culture learning, and social identity (Ward, Bochner, & Furnham, 2001) are all represented in the highly cited works. The last work *Multiple Regression: Testing and Interpreting Interactions* is the only work on research methodology on the top cited list.

Fig. 3 shows the changes in influence of five texts. Chi-square tests were performed to determine the statistical significance of the changes. Hofstede's *Culture's Consequences* has the most stable citation record, in which citations start occurring shortly after its publication in the 1980s with increasing citations thereafter. Citations to the *Handbook of Intercultural Training* were high with only slight fluctuation in the '90s, but started to drop since 2000. Kim and Gudykunst's *Theories of Intercultural Communication* was cited widely from the '90s to around 2005, but has become less well so since.

The trends of citations from different subjects over time are shown in Fig. 4. Chi-square tests show significant changes in the proportions of citations in the biomedical sciences, business and economics and sociology over time. Communication is the only field with a declining number of citations.

3.2. Sub-disciplines of IR

Co-citation analysis was used to find the connections between cited references, allowing a subject relatedness map to be generated. This map is shown in Fig. 5. Distance in this visualization is correlated to the strength of co-citation, which is the number of times that two cited references have been cited together. Generalized subject categories were applied from WoS, and nodes were labeled accordingly. Multiple strong clusters are seen, several which correlate strongly with parent disciplines, other central clusters are more multidisciplinary in nature. The most prevalent discipline is psychology, which seems to form two or more large clusters.

Further analysis was applied to this dataset and a control group dataset to see whether IR is an interdisciplinary connection between its parent disciplines. The control group was a dataset retrieved from WoS and consisting of the same number of records from the same source journals identified in the IR dataset. The weighted degrees of all edges within and between

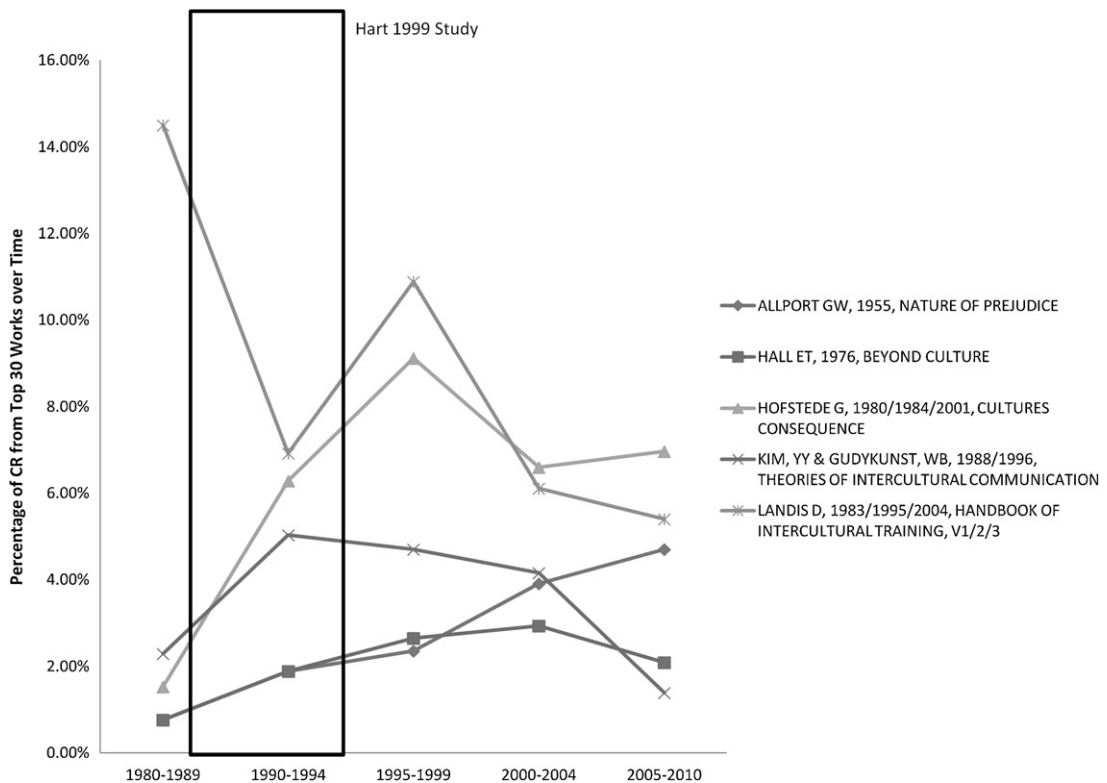


Fig. 3. Trend of work influence over time. The proportion of citations of several texts out of the total citations in the top 30 works in each time period. Important trends to note are the new importance of Allport's *Nature of Prejudice*, and the continued relevance of Hall's *Beyond Culture*.

all component SC in the co-citation networks were calculated. Chi-square test results show that the between SC weighted degree of IR (24%) is statistically different from that of the control group (14%) ($p < .0001$).

3.3. Cultural interactions in IR research

Abstracts of source records are coded twice to find out what are the most studied cultural groups in IR. The first pass is to distinguish studies about cultural groups in different nations/countries from studies about within national cultural groups or without specified cultural groups. Those that are specified as sojourners (international students and expatriates) and first generation immigrants are coded as between nation studies. This trimmed the 770 source records by half to 330. Then for studies about cultural groups from different nations/countries, each mentioned cultural group is recorded in line with the breakdowns of countries and regions in the 2010 World Population Reference Bureau's list.

Using the coded information, the countries of the groups most commonly studied together are shown in Table 1. These are compared to the 2010 Bilateral Migration data from the Database on Immigrants in OECD countries (DIOC) report. The largest migration patterns from this report are compared with their citation information. This shows that several migrations, such as Turkey-Netherlands, Canada-China, US-Japan, are overrepresented in the top cited WoS literature. Out of the top 10 cultural interactions in IR research, seven include the United States. Table 1 shows that several significant migration patterns, such as India-UAE, India-Saudi Arabia, Malaysia-Indonesia, are underrepresented in the top cited WoS literature. Only two out of the 10 highest migrations include the United States.

4. Discussion

A major contribution of this work is identifying and defining the field of IR with a comprehensive and selective data collection procedure. Without this method, any search on IR related keywords would be rife with extraneous results from neighboring disciplines. This problem is likely due to the interdisciplinary nature of IR. This makes Hart's dataset, which uses a journal specific approach but does not refine based on manual coding, one that does not consist solely of what this study and Kim define as IR.

This study set out to provide an updated view of the field of intercultural relations since Hart's 1999 study. There are several key points of difference between this study and Hart's. First, being composed of data that includes and extends Hart's work by 15 years, it should expect to both replicate portions of the previous results and discover new trends appearing over

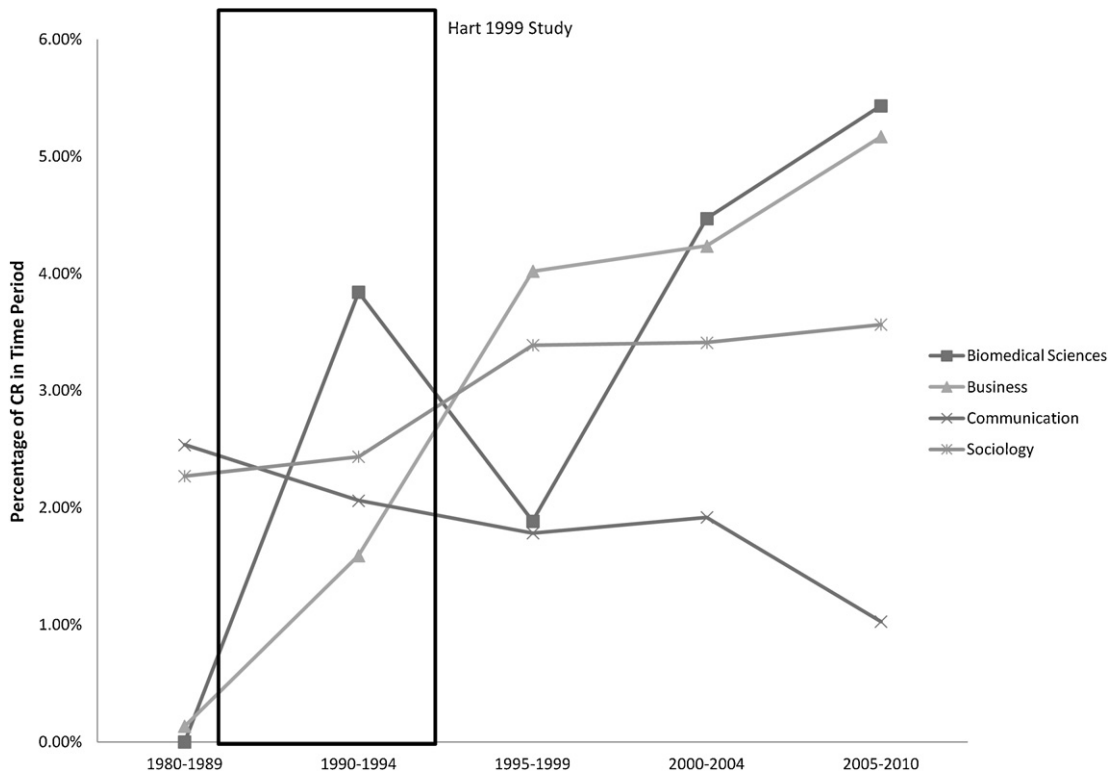


Fig. 4. Trend of subject influence over time. The proportion of the cited references labeled with a particular Major Subject Category in given time periods for several subjects. Business and sociology show significant increases in proportion over time, while communication shows a significant decrease. Biomedical sciences show a nearly significant increase.

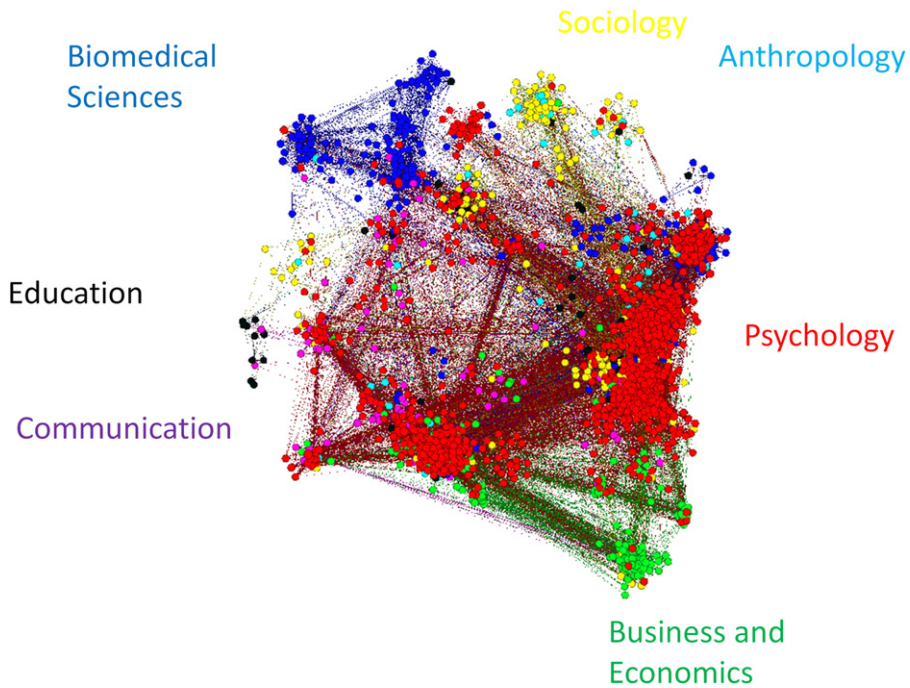


Fig. 5. Co-citation map of intercultural relations. A co-citation based map of the cited references. Distance roughly corresponds to strength of co-citation, as laid out by the OpenOrd visualization algorithm. Nodes are colored by their Major Subject Category. Notice how the parent subjects cluster strongly at the edges of the graph while the central portions are more multidisciplinary.

Table 1
Highest cited and highest migration country pairs.

Country pair	2010 migration	Proportion of total migration	# of costudies	Proportion of total studies
(A) Top cited				
United States Mexico	12 million	0.056	36	0.089
United States Japan	0.4 million	0.002	18	0.045
United States Korea	1 million	0.005	11	0.027
United States India	1.6 million	0.008	9	0.022
United States Puerto Rico	1.8 million	0.009	8	0.020
United States Germany	0.8 million	0.004	8	0.020
United States China	1.7 million	0.008	7	0.017
Germany Turkey	3 million	0.014	7	0.017
Netherlands Turkey	0.2 million	0.001	6	0.015
Canada China	0.5 million	0.003	6	0.015
(B) Top migration				
United States Mexico	12.1 million	0.056	36	0.089
Ukraine Russia	7.3 million	0.034	0	0.000
India Bangladesh	4.3 million	0.020	0	0.000
Germany Turkey	3 million	0.014	7	0.017
Kazakhstan Russia	4.8 million	0.023	0	0.000
India UAE	2.2 million	0.010	0	0.000
Philippines United States	1.8 million	0.008	2	0.005
Iran Afghanistan	1.7 million	0.008	1	0.002
Saudi Arabia India	1.5 million	0.007	0	0.000
Malaysia Indonesia	1.4 million	0.006	0	0.000

time. Second, by expanding the source data beyond *IJIR* to the entire WoS IR dataset using a coding system that ensures high recall and precision, it provides this description with more confidence and gives a sense of the usefulness of the Web of Science database for doing IR bibliographic research in the future.

4.1. Highly cited authors/journals/works

The results found form a new sketch of the field of intercultural relations in terms of its most influential authors, journals, subjects and works. The top three cited authors are all well known for theory development in the IR field (Berry's acculturation strategy theory, Gudykunst's uncertainty and anxiety theory, and Black's model of international adjustment). The highly concentrated citations to these theorists suggest wide acknowledgment and application of the theories in the field. However, it is unclear whether each of the theorists has their own clique in which they are influential or if their impact is disseminated over the entire IR field. A closer look at the co-citation structure of the field will be necessary to explore these questions.

Moreover, the prominence of John Berry, the top cited author, with twice as many citations as the next most cited author, may indicate the presence of a prevailing paradigm (at least in studies on acculturation) as suggested by Ward (2008) and Rudmin (2006).

With regard to journals, it is assumed that the field has become more distributed across a wider range of journals. However, the data show that although the number of cited references is growing steadily, the number of unique sources has stayed quite stable since the '80s. One explanation may be that WoS does not exhaustively cover enough new journals from the IR field (especially journals from communication studies), thus the expansion is not observable using this dataset. An alternative explanation may be that IR articles are published in the same journals as in the '80s, but represent a larger proportion of the articles published in those journals.

While 30 years ago, *IJIR* may have had the majority of intercultural relations publications, and still does, the total percentage of publications in *IJIR* compared to the entire field has decreased. Hart's study assumed *IJIR*'s importance as a central player in the IR field without validation. This study shows that *IJIR* is still one of the most comprehensive sources of IR research, validating Hart's 1999 study in its choice of source material. Yet, the journal reference list used in this study show that four major communication association journals of IR are not covered in WOS:

- International and Intercultural Communication Annual (Speech Communication Association).
- Journal of Intercultural Communication Research (World Communication Association).
- Journal of International and Intercultural Communication (National Communication Association).
- Intercultural Education (International Association for Intercultural Education).

Since these journals are not in the source records, their relative influence compared to *IJIR* cannot be evaluated using this dataset. To estimate the potential impact of the absence of these journals from communication field in the original searching, the same search was conducted for peer-reviewed journal article abstracts (1980–2010) in Communication and Mass Media Complete (CMCC) database (via EBSCO), which retrieved 1316 source records in total. All journals Except *Asian Journal of Communication* (8 results in CMCC search; 6 results from 2008 when WoS started coverage) and *Intercultural Pragmatics* (19

results in CMCC search; 8 results from 2008 when WoS started coverage), 8 out of the top 10 source journals are not covered by WoS. This leaves roughly 1300 source records without coverage. As CMCC database does not provide information on citation counts or cited reference, it is hard to get a good estimate on how many would fall within the top cited group, but it is clearly not insignificant. This may have an impact on the findings and future studies should consider source expansion to reduce database coverage bias.

Compared to Gudykunst's (2002, pp. 2–5) brief review of intercultural communication topics, the topics that might be excluded due to WoS coverage bias are intercultural nonverbal communication, linguistic relativism, uncertainty in initial contact, and intercultural communication competence.

IR is a discipline that grew out of practical concerns for enhancing mutual understanding across different cultures and nations after World War II by the Foreign Service Institute. The materials developed by the first generation scholars for effective training of overseas posting personnel are informed by cultural anthropology and area studies (Landis & Wasilewski, 1999; Leeds-Hurwitz, 1990; Rogers, Hart, & Miike, 2002). The origin of this field is reflected in the frequent citation to the three volumes of the *Handbook of Intercultural Training* and the noticeable impact of Edward T. Hall's books in the '80s and '90s. Later on as urged by researchers (Kim, 2000; Landis, 1997), more efforts were made for theory development to consolidate the field as a scientific (sub)discipline, the result of which is reflected in the rising of number of citations to *Theories of Intercultural Communication* from the '90s to 2005. The unexpected revival of citedness to *The Nature of Prejudice* (1954) may be indicative of the shifted focus toward acculturation studies of immigration and sojourn, which treat prejudice as a prominent predictor construct.

4.2. *Disciplinary composition of IR and its interdisciplinarity*

The analysis shows statistically significant changes in the disciplinary composition of IR over time. Unchanged is the dominance of psychology as the journal field that publishes the majority of IR research. This may simply be due to the comparative sizes of the fields, there being many more psychology journals than anthropology journals, for example, and this study does not address that possibility directly, but because these cited references are not chosen at random, but are at least nominally chosen by authors to support their work, it seems unlikely that such a size effect could entirely explain the proportions found. For instance, there are also many more biomedical journals than anthropology journals, and yet only recently have such citations been increasing rapidly in the IR literature. The increasing proportion of cited references in the biomedical sciences and business fields may be a sign of the maturation of the IR discipline as early theories begin to be applied to other fields. Alternatively it could be due to changing citation practices (such as an increase in the importance of non-WoS references for fields such as Communication), or changing WoS coverage. As discussed below, there seems to be an evolution in the WoS coverage of IR literature. Further research will be needed to answer this question.

An additional useful finding is the trend of increasing WoS coverage over time. IR is an interdisciplinary field with substantial social science and humanities influences, and these academic disciplines are known to have limited coverage in the Institute for Scientific Information (ISI) databases. This was clearly true in the 1980s, but now half of IR references are WoS based, and this will likely continue to increase. WoS is becoming an increasingly useful database for conducting IR research and for evaluation of the field. However, the continued importance of texts shown in this study also hints that IR still contains elements of publication that the ISI databases do not include. Further study to source expands this dataset to elucidate the ramifications of these publication practices is needed.

The findings of this study show that IR is indeed a multidisciplinary field. At the time of Hart's study, the parent fields consisted of psychology, anthropology, sociology, and communication. This study not only confirms this foundation in the 1980s, but also shows a steady trend of increasing involvement of the biomedical and business fields in IR research. Overall, the co-citation map shows that IR is clearly at the intersection of the five fields of psychology, business, the biomedical sciences, communication and sociology. IR exists in the linkages between these fields, with psychology in a central role. Further network analysis is needed to show how these fields connect and interact.

4.3. *Cultural representation in the IR literature*

This study shows that a few cultural pairings are well represented in the literature, while others are less associated with current migration patterns. This is to be expected from an organic scientific discipline, but these results can help elucidate biases and drive further research into under-represented areas. While this study only used migration data from 2010 for its comparison, it is known that international business and other temporary interactions can be a major factor in the importance of a cultural pairing as well. Also, earlier population movements might have driven earlier IR research. This would explain the prominence of US-East Asian studies, even though migration between these regions is small. However, the lack of research into major areas of regional migration, such as the Middle East and Southeast Asia, demonstrates an area where IR research could expand.

4.4. *Suggestions and future research*

The results shown in this study have provided an updated look at the state of the IR field over the past 30 years. Several limitations are still evident. The accuracy of bibliometric analysis can only be as good as the data that is collected. In this

study, measures were taken to make sure that the retrieved content from WoS consisted of all and only IR records. While it is clear that the coverage of WoS of the IR field is increasing, several of the IR subfields rely heavily on texts and journals not indexed in WoS (about 50%). Besides, it is difficult to determine the extent the current results are influenced by the limited coverage of communication journals in comparison to adequate coverage of psychology journals in WoS. Therefore, this study could be greatly improved by further work expanding its source records to major books and non-WoS journals. But, even with these limitations, this study is a major step forward from previous analyses of IR.

Yet, with these limitations, the results of the analysis still inform the IR field in several important aspects. First, the major authors, journals, and works identified here provide a quantified map of the development of IR as a field of study. This map is useful in curriculum design and also to inspire researchers to fill existing gaps in coverage. It can also be expanded in the future to examine more deeply into the connection between theories, topics, and methodologies used in IR. For example, an intriguing question would be the extent to which the major theories/models and theorists link, expand or demarcate the field.

Second, the co-citation analysis presented here shows the interdisciplinary position of IR at the intersection of multiple disciplines. This may help professional associations, funding agencies, and conference organizers acknowledge the scattered academic efforts that share the same intellectual core. IR researchers should use this finding to reach out to the adjacent disciplines. It also indicates that there may be a need for interdisciplinary journals. However, this study still only uses pre-assigned subject categories to label IR subgroups. Future work may use the structure of the co-citation network itself to identify subgroups within the field, possibly revealing unexpected interdisciplinary collaborations and areas of research.

Third, the results from this study may suggest a need to redefine the IR field. In the early stages of IR research, long-distance interactions or virtual collaborations were limited or still to be developed. Therefore, this early definition's emphasis on face-to-face interpersonal interactions as a requirement of IR is understandable. Yet, as communication media have changed dramatically which almost set intercultural interactions from time or space, the definition of IR should be expanded to reflect this change. Furthermore, this study shows the increasing importance of interactions in environments such as business and medicine as part of the IR literature. This suggests that the definition may need to be expanded to include interactions through the activities of these fields, which include non face-to-face, non verbal interactions, to keep the field relevant in modern times.

5. Conclusions

The major conclusions of this study are the identification of influential authors, journals, works and subjects in the field of IR over the past 30 years, using a highly selective dataset representative of the field. There are indications that WoS is becoming an increasingly useful database for the IR field, and that the nature of the field is changing. This work can guide current and future scholars in IR to be more aware of their own discipline and give an indication of where intercultural relations is headed in the future.

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Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at <http://dx.doi.org/10.1016/j.ijintrel.2012.11.005>.

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