

Geropsychology and Psychology in the German-Speaking and Anglo-American Research Community

A Bibliometrical Analysis

Gerontopsychologie und Psychologie in der deutschsprachigen und anglo-amerikanischen Forschungsgemeinde: Eine bibliometrische Analyse

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Summary: This paper is aimed to add to the understanding of the recent history of geropsychology by use of an underutilized tool, i.e., bibliometrical analysis. First, we employ an “external perspective” by focusing the development of geropsychology against the background of psychology as a whole as well as other selected psychology subfields. Second, from an “internal perspective,” we were interested in how major subfields of geropsychology have developed. In both of these issues, we compare the Anglo-American to the German-speaking research community. Third and finally, we explore the relative contribution of geropsychology work coming from German-speaking countries to the international literature. Regarding the external perspective, the major finding is that geropsychology has become a well-established subfield of psychology over the last quarter of the 20th century both in the Anglo-America and German-speaking research community. In particular, geropsychology has become a very prominent part of developmental psychology in German-speaking countries. From an “internal perspective,” research on cognitive functioning was the most frequent and consistent contributor to the geropsychology literature in both regions. Different between regions was the diverging interest in research on life experiences and coping (which was much higher in German-speaking countries). Finally, recent geropsychology research from German-speaking countries has contributed – in relative terms – more to the international literature than the psychology literature as a whole has done.

Keywords: Geropsychology, bibliometrical analysis, German-Anglo-American comparison, developmental psychology, history of psychology

Zusammenfassung: Ziel der Arbeit ist es, einen Beitrag zu einem besseren Verständnis der rezenten Geschichte der Gerontopsychologie anhand eines für diesen Zweck bislang wenig genutzten Instruments, der bibliometrischen Analyse, zu leisten. In einem ersten Schritt wird im Sinne einer “externalen Perspektive” die Entwicklung der Gerontopsychologie mit jener der Psychologie insgesamt verglichen. Zum Zweiten

wird im Sinne einer "internalen Perspektive" untersucht, wie sich wesentliche Teilgebiete der Gerontopsychologie entwickelt haben. In einem dritten Schritt wird gefragt, welchen Anteil die deutschsprachige gerontopsychologische Literatur am Gesamt der internationalen Literatur besitzt. Insgesamt unterstützen die bibliometrischen Befunde, dass sich die Gerontopsychologie im Laufe des letzten Viertels des 20. Jahrhunderts in der deutschsprachigen und anglo-amerikanischen Psychologiegemeinde fest etabliert hat. Besonders ausgeprägt ist dies für das spezielle Feld der Entwicklungspsychologie und hier besonders im deutschsprachigen Raum. Wie zu erwarten ist es die kognitiv orientierte Forschung, die am konsistentesten über den Beobachtungszeitraum hinweg relativ am meisten zur Gerontopsychologieliteratur beiträgt. Unterschiede zwischen den beiden Untersuchungsräumen treten vor allem im Bereich "Kritische Lebensereignisse und Bewältigung" auf (höher im deutschsprachigen Raum). Schließlich liegen die Anteile der Gerontopsychologie aus dem deutschsprachigen Raum am Gesamt der internationalen Gerontopsychologieliteratur im Vergleich der deutschsprachigen mit der internationalen Psychologieliteratur im Allgemeinen höher.

Schlüsselbegriffe: Gerontopsychologie, bibliometrische Analyse, deutsch-anglo-amerikanischer Vergleich, Entwicklungspsychologie, Geschichte der Psychologie

Geropsychology or alternately, the psychology of aging or psychological gerontology, (Birren & Schroots, 2000, 2001) addresses psychological research related to human aging. The present paper rests on the assumption that it is (as for every science or scientific subfield) important to reflect – from time to time – upon the history of one's field of study. The major goal of such reflections is to better understand the "developmental" course and outcome of geropsychology in terms of observable trends and changes in research priorities, paradigms, and categories of findings. Insights of this kind may help illuminate the scientific community regarding existing patterns of knowledge production and thus influence future efforts to improve theoretical frameworks, scientific methods, and the quality of empirical findings.

Our work is aimed to add a quantitatively oriented piece of information to the existing body of narrative treatises of the history of geropsychology (e.g., Achenbaum, 1995; Baltes & Baltes, 1992; Birren, 1961a, b, 1996; Birren & Schroots, 2000, 2001; Lehr, 1972, 2000; Munnichs, 1966; Thømae, 1994; Wahl, 2003). In particular, we will make use of a bibliometrical analysis of the geropsychology literature. The basic idea of this kind of analysis is that trajectories inherent in the quantitative evolution of the literature tell us something substantial about the developmental dynamics and standing of geropsychology within its parent discipline (i.e., psychology) as well as about the developmental dynamics and standing of its subfields (such as cognitive aging or coping research). We thus take advantage of an analytic tool which

interestingly enough has not been used very frequently with respect to geropsychology since the early efforts of scholars such as Klaus Riegel (1973, 1977). In order to frame our bibliometrical analysis within a broader historical context, we begin with a brief summary of the historical development of geropsychology up to the end of 1970s, that is, until the point in time, when our bibliometrical analysis starts. Due to the comparative intention of the present work, that is, to contrast the development of geropsychology in German-speaking countries with that of the Anglo-American research community, we focus this sketchy historical overview on both these regions (see for example Dubin, 2000, for a broader international perspective).

The first major treatise on the history of geropsychology is Birren's well-known two-part article in the first volume of *The Gerontologist* (Birren, 1961a, b). Birren suggested at that time a differentiation within the historical development of geropsychology as follows: (1) the early period, 1835–1918; (2) the beginning of systematic studies, 1918–1940; and (3) the period of expansion 1946–1960. The point in time chosen by Birren to indicate the beginning of the "early period" of geropsychology refers to Belgium mathematician, statistician, astronomer, sociologist, and psychologist Quételet, whose two-volume book "Sur l'homme et le développement de ses facultés" was published in 1835. Quételet's major contribution to the development of geropsychology as a scientific discipline can be seen in his enthusiasm for a scientific approach to the study of human develop-

ment per se, his promotion of the concept of the average man ("l'homme moyen"), as well as his broad scope of empirical (including age-related) studies covering social issues such as crime, suicide, and marriages. Another landmark work during this early period was provided by British anthropologist and psychologist Sir Francis Galton, who gathered data during the International Health Exhibition in London, 1884, on 9,337 males and females aged 5 to 80 years using 17 anthropometric and psychophysical measures (Galton, 1885). Among Galton's contributions was his suggestion of a correlation index (later transferred into the Pearson correlation coefficient) to analyze his huge amount of data. Unfortunately, Galton disqualified himself to some extent parallel to his outstanding achievements with his engagement and writings to support eugenics, which were later used by the Nazis to legitimize their racial policy.

Major contributions during the "beginning of systematic studies" period between 1918 and 1940 were Stanley Hall's (1922) "Senescence. The Last Half of Life" and the intelligence and aging related studies of Walter Miles conducted in Stanford which began in 1927 and were summarized in a 1933 issue of "The Psychological Review" based on his Presidential Address given in 1932 before the American Psychological Association (APA). The Miles chapter in Cowdry's (1939) "Problems of Aging," to be noted, was the only geropsychology contribution to this now classic interdisciplinary landmark publication on gerontology. From an international perspective, one must also mention Austrian developmental psychologist Charlotte Bühler's (1933) book on "Der menschliche Lebenslauf als psychologisches Problem" (The Human Life-span as a Psychological Problem) as well as the introduction of the "Zeitschrift für Altersforschung" (Journal of Age Research) in Germany in 1938, whose first volumes contained a few geropsychology and geropsychiatric papers. In particular, von Bracken (1939) provided an overview on geropsychology, in which he already referred extensively to the American geropsychology literature, including the work of Hall (1922) and Miles (1933). Hofstätter (1938) also clearly demonstrated in his article on "Tatsachen und Probleme einer Psychologie des Lebenslaufs" (Facts and Problems of a Life-span Psychology) that German-speaking psychologists interested in life-long development and aging were well aware

of the American geropsychology literature existing at that time.

Milestones from the "period of expansion" between 1946–1960 were the foundation of the Gerontological Society of America (1945) and the introduction of the "Journal of Gerontology" (1946), the APA's implementation of a division on "Maturity and Old Age" (also in 1946) now called "Adult Development and Aging," and the publication of the "Handbook of Aging and the Individual" edited by Birren (1959), in which about 50% of the 24 chapters were substantially geropsychological in nature. The foundation of the International Association of Gerontology (IAG) in July of 1950, with its section on Social and Behavioral Science also deserves mentioning here. With respect to German-speaking countries, German developmental psychologist Hans Thomae (1915–2001) began his strong involvement in research concerned with a life-span view of human development with particular emphasis on geropsychology during the fifties, which provides the impetus for the journal "Vita Humana" in 1958 (since volume 8, 1965, "Human Development") and the elaboration of his life-span developmental psychology point of view in the first German multi-volume handbook of psychology (Thomae, 1959).

Since the early 1960s, geropsychology entered into what might be called a consolidation period of its development. This period can be seen in hindsight as roughly ending around the end of the seventies/beginning of the eighties, a point in time when geropsychology became a well-established gerontological and psychological subdiscipline (Achenbaum, 1995; Birren & Schroets, 2000, 2001). Among the major expressions of successful consolidation during this period was the first edition of the "Handbook of the Psychology of Aging," edited by Birren and Schaie (1977). Lehr's "Psychology of Aging" ("Psychologie des Alterns"; first edition published in 1972) and Oswald and Fleischmann's "Geropsychologie" ("Gerontopsychologie. Psychologie des alten Menschen," 1983) can be seen as clear indicators of this development in Germany.

With respect to historical issues, Klaus Riegel's (1977) chapter in the edition of the "Handbook" now is a classic review of the literature which, assisted by S. Brumer, consisted of a painstaking bibliometrical analysis covering the period between 1920 and 1972. Riegel found that geropsy-

chology publications accelerated particularly after World War II up to 1972 with a climax of 247 publications in the year 1969. The present analysis is aimed to extend this early work concerned with the evolution of the geropsychology literature by addressing three aspects of its recent developmental dynamic. First, the development and role of geropsychology as a subfield of psychology is an important topic of our analysis. Birren and Schroots (2001) have shown the rather slow rise of geropsychology as a subject matter within 20th century psychology. According to Birren and Schroots, geropsychology was characterized by "age-less" behaviorism, a Piagetian view of human development (which generally ignored adult development), as well as a strong experimental research tradition with its tendency to downsize interindividual differences as "measurement error." Interestingly enough, however, we are not aware of any effort to address the recent development of geropsychology as a subfield of psychology by means of a quantitative literature analysis.

Second, the development of major subfields within geropsychology is another important aspect of its evolution. Riegel (1973) argued that geropsychology has addressed virtually every subdiscipline of psychology and in roughly the same order that they were developed. In particular, geropsychology's strong emphasis on the aging of the human mind in the beginning and during its phase of expansion might be seen as reflecting the general trend of early psychology to focus on memory and other cognitive function modalities. Again, however, we are not aware of any quantitative literature analysis concerned with the recent development of different geropsychology subdisciplines.

A third guiding idea for this work was to provide a comparison between geropsychology developments in the Anglo-American region and German-speaking countries based on the assumption that such international contrasts add to our understanding of the field and counteract an overly narrow country-specific view in whatever direction (see also Birren & Schroots, 2000, for an international perspective). Once again, no such bibliometric analysis has been conducted to our knowledge.

There are conceptual as well as practical reasons why we concentrate the present analysis on the last quarter of the 20th century. In conceptual terms, the goal was to focus our bibliometrical analysis on the years following the consolidation period of ge-

ropsychology, which began in the mid 1970s. In other words, the idea was to direct our attention to that phase of the development of geropsychology, in which it reached a certain scientific maturity, having left behind its early period, the beginning of systematic studies period, the phase of expansion as well as a period of consolidation. In more practical terms, the literature documentation system *PsycInfo* used in the present work is available for *computer-assisted search* beginning with the year 1967 and mostly contains Anglo-American research contributions (the reason why we label in the following the region or research community mainly addressed by *PsycInfo* as "Anglo-American"). In addition, the literature documentation system *Psyndex* contains only psychology work written in German from Austria, Germany, and the German-speaking regions of Switzerland (the reason why we label in the following the region or research community mainly addressed by *Psyndex* as "German-speaking") and allows for a computer-based search since 1977. Hence, due to the plan to compare both of these regions as well as due to reasons of economy (not allowing us for a manual literature analysis), the year 1977 had to be chosen as the starting point for our analysis. Fortunately enough, this date is also in complete accordance with our conceptual goal, namely to address the post-consolidation period of the geropsychology evolution. Also, it was assumed at the point in time when the calculations for this article were run (August to October 2001) that most of the literature for the year 2000 had been documented in *PsycInfo* and in *Psyndex*. Thus, we finally ended up with the period between 1977 and 2000, but will technically present most of our findings based on a two-year unit of analysis from 1978–2000.

The result section of this work is organized around three conceptual issues: A first issue is concerned with the recent development of geropsychology within psychology ("external perspective"). The most basic question to be addressed here is: How has the geropsychology literature developed within the psychology literature as a whole since the end of the seventies in the Anglo-American and German-speaking research community, and what similarities and differences can be observed compared to other psychology subdisciplines? We restrict this contrast to three psychology subdisciplines: For one, we have selected developmental psychology as a psychology subdiscipline

which normally is regarded as very close to geropsychology; geropsychology is frequently even being regarded as a subfield of developmental psychology. Second, we have chosen environmental psychology as a relatively new, "trendy" and strong interdisciplinarily oriented field of psychology; all these feature are in a sense similar to geropsychology and thus a contrast of the development of both of these fields seems interesting. Third, we consider the development of experimental psychology, a classic field of study since psychology began. Another question framed within the external perspective of the development of geropsychology is the interaction between geropsychology and other psychology subfields. In other words, the issue explored here is how frequently geropsychological work refers to other subdisciplines of psychology (or the "import" of other psychological research to geropsychology) and, vice versa, how frequently other subfields of psychology refer to geropsychology (or the "export" of geropsychology work to other psychology subfields).

A second issue addressed below is the recent development within geropsychology ("internal perspective"). Here, the major question is: How have substantial subfields of geropsychology developed in the Anglo-American and German-speaking research community since the end of the seventies, and what similarities and differences can be observed in this regard? This analysis will focus for the sake of brevity only on four major subfields of geropsychology, namely: (1) cognitive functioning, (2) life experiences/coping, (3) life satisfaction/well-being, and (4) behavioral competence.

A third issue addressed in this work, one that is often discussed in the German-speaking gerontology scientific community, concerns the question of the contribution of its geropsychological publications to the international literature, in which the Anglo-American literature plays a very important role (e.g., Wahl & Kruse, 1999). One aspect of concern is how the geropsychology literature in total from German-speaking countries compared to other psychology fields of psychology (developmental psychology, environmental psychology, general psychology) or compared to psychology as a whole, has developed in relation to the rest of the international literature. A second aspect concerns how the literature from German-speaking countries addressing different geropsychology subfields (such as cognitive functioning, life expe-

riences/coping, life satisfaction/well-being, or behavioral competence) has developed in relation to the rest of the international literature.

Method

The present analysis is completely based on an On-line/CD-ROM search of the psychology literature documented in PsycInfo and Psynindex covering the years from 1977 to 2000. It is significant to know, that overlap between literature documents in PsycINFO and PSYINDEX does not exceed 5–7%. Thus, double counting cannot substantially impact on any trend reported in this paper. As descriptors to detect geropsychological work, the index terms "Aged" and "Very Old" as well as the Classification Code (CC) "Gerontology" were used in logical "or" conjunction. With respect to the identification of the geropsychology subfields considered in this work, the following index terms were used for cognitive functioning: "Cognitive Development," "Intellectual Development," "Intelligence," "Memory," and "Cognitive Abilities." The subfield of life experiences/coping was addressed by use of the index terms "Life Experiences" and "Coping Behavior," while the subfield life satisfaction/well-being was addressed by exactly the same index terms. Finally, geropsychology research concerned with behavioral competence was identified by use of the index terms "Activities of Daily Living," "Competence," "Leisure Time," and "Recreation."

Besides one central result addressing the development of the quantitative literature in absolute terms, all other findings of the present work are based on relative frequencies with the absolute number of literature citations taken as the basis for this calculation for each year of publication respectively. This allows for better comparison across the years on the level of different contents (such as different geropsychology subfields) as well as regions. Also, incomplete literature documentation with regard to the year 2000 is no longer a problem when relative frequency of publication is the unit of analysis. One should also note that identifying the overall emerging trend across time is the major tool of our interpretation; thus, increase or decrease from only one year to the other is subject to a diversity of influences and should

not be taken into serious consideration. Subfields of psychology used as a background of comparison for the development of the geropsychology literature have been identified with the CCs "Developmental Psychology," "Environmental Psychology," and "Human Experimental Psychology." Furthermore, the following CCs were used to identify additional psychology subfields in the import/export analyses: "Social Psychology," "Personality Psychology," "Clinical Psychology (i.e., 'Disorders' and 'Treatment and Prevention')," "Sport Psychology and Leisure," "Educational Psychology," "Industrial and Organizational Psychology," and "Psychometrics."

The issue of "import" versus "export" was handled as follows: As a rough indication of import, the relative frequency of the number of geropsychology work containing a second CC referring to another psychology subfield, of all geropsychology work published between 1977 and 2000 was calculated. As a rough indication of export, the relative frequency of other psychology subfields containing geropsychology as a second CC, of all work of the according psychology subfield published between 1977 and 2000 was calculated. In terms of "other" psychology subfields, basic disciplines (such as experimental or social psychology) as well as more applied subfields (such as clinical or educational psychology) are considered both in the import and export analyses. Finally, as a plausible means of estimating the contribution of work from German-speaking countries to the international literature in an at least tentative manner, we have simply calculated the relative contribution of the geropsychology literature from German-speaking countries to

the total of both the literature citations inherent in Psycindex and in PsycInfo.

Results

The "External Perspective": Development of Geropsychology Within Psychology as its Parent Discipline

Development of the Geropsychology Literature in Absolute Terms and Comparison with the Psychology Literature as a Whole

To begin with, Figure 1(a) depicts the recent development of geropsychology literature citations in absolute terms. One remarkable aspect of the developmental trajectories found in both regions is the clear increase since 1978 and a plateau beginning around 1986–88 and lasting until the end of the century (the decrease in 2000 should be ignored due to incomplete documentation in both systems). Obviously the plateaus depicted in Figure 1(a) are at different levels, very roughly amounting to 500–600 literature citations per year in PsycInfo and 200–300 literature citations per year in Psycindex.

It is also remarkable that geropsychology literature citations in the Anglo-American region have roughly doubled between 1978 and the beginning of its plateau phase, which echoes in a sense Riegel's (1977) estimation that the geropsychology literature has doubled every 8.3 years between 1873 and 1972. In contrast, the rate of increase in

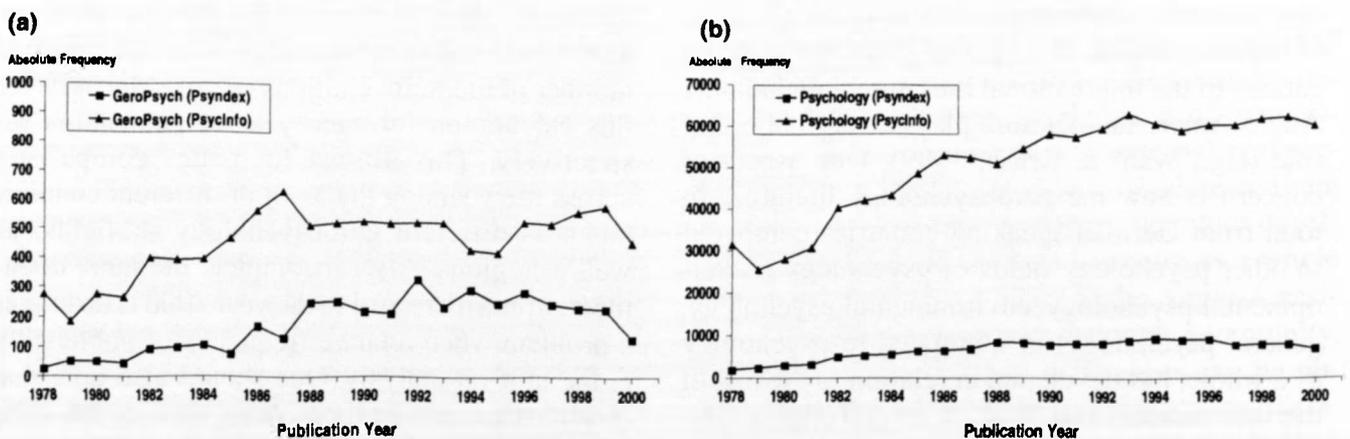


Figure 1. Absolute frequencies of geropsychology (a) and psychology (b) literature citations 1978–2000 in PsycInfo and Psycindex.

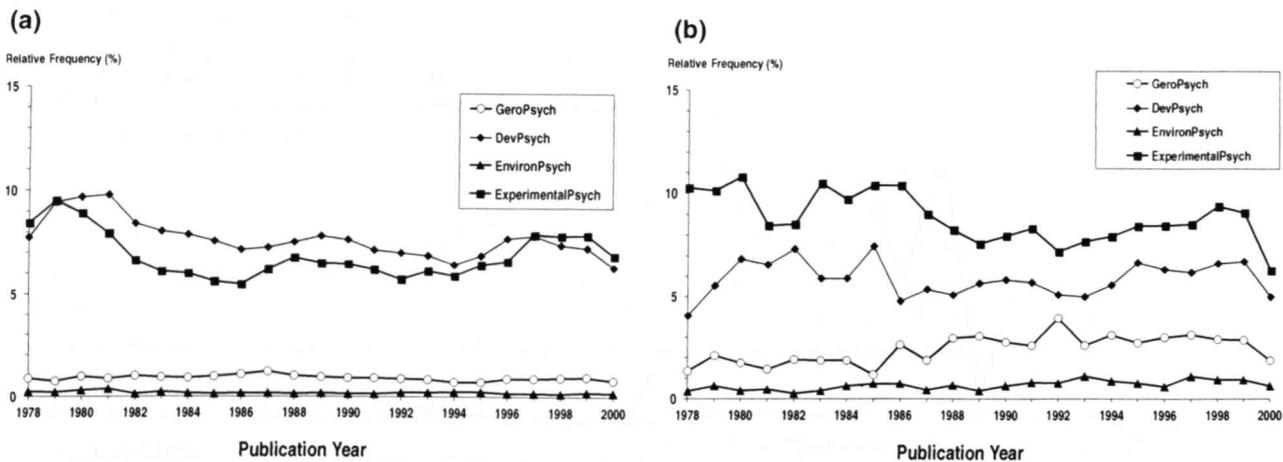


Figure 2. Relative frequencies of geropsychology literature citations as compared to developmental psychology (excluding aging), environmental psychology, and experimental psychology 1978–2000 in PsycInfo (a) and Psycdex (b).

the German-speaking region is higher during this period of time, amounting roughly to a factor of 10 between 1978 and the beginning of the plateau phase.

Moreover, as can be seen by also taking Figure 1(b), depicting the psychology as whole literature, into consideration, the trajectory of the geropsychology literature of German-speaking countries, in absolute terms, is roughly similar to the development of psychology in this region in general. In contrast, the Anglo-American psychology literature as a whole kept growing until the early nineties, whereas growth in the subfield of geropsychology already stopped in the second half of the eighties.

Development of the Geropsychology Literature Compared to Other Psychology Subfields

Figure 2(a) shows the development of the geropsychology literature in the Anglo-American region compared to the growth of developmental psychology (considered here only *without* work on human aging), environmental psychology, and experimental psychology. In particular, the relative frequencies of these bodies of literature compared to all psychology literature citations of each year between 1978 and 2000 are depicted. As can be seen, the Anglo-American geropsychology literature consistently comprised about one percent of the total psychology literature across the observation period.

The one percent rate of the Anglo-American ge-

ropsychology literature between 1978 and 2000 is clearly and consistently higher than the rate of the other rather new psychology subdiscipline considered here, namely environmental psychology. Furthermore, Figure 2 (a) also shows that the proportion of experimental psychology literature has decreased between 1978 and the early nineties, followed by a sort of recovery since that time and the end of the century. In contrast, the developmental psychology literature (excluding aging research) shows a slight but rather consistent decreasing tendency across the observation period. Obviously, and as to be expected, both of these bodies of literature have a much higher share of the research market compared to geropsychology, but always below ten percent of the total.

The development of geropsychology literature in the German-speaking region shows similarities and differences compared with the Anglo-American region (Figure 2 b). In both regions, the geropsychology literature is clearly and consistently larger than the environmental psychology literature between 1978 and 2000. It is worth noting, however, that the percentage of the geropsychology literature in the German-speaking research community always comprises more than one percent of the total psychology literature and even shows considerable increase of up to three percent by the end of the eighties. That is, although the absolute number of publications in geropsychology has remained on the same level since the end of the eighties, the relative contribution of the geropsychology literature to psychology as a whole has markedly increased since that time in German-

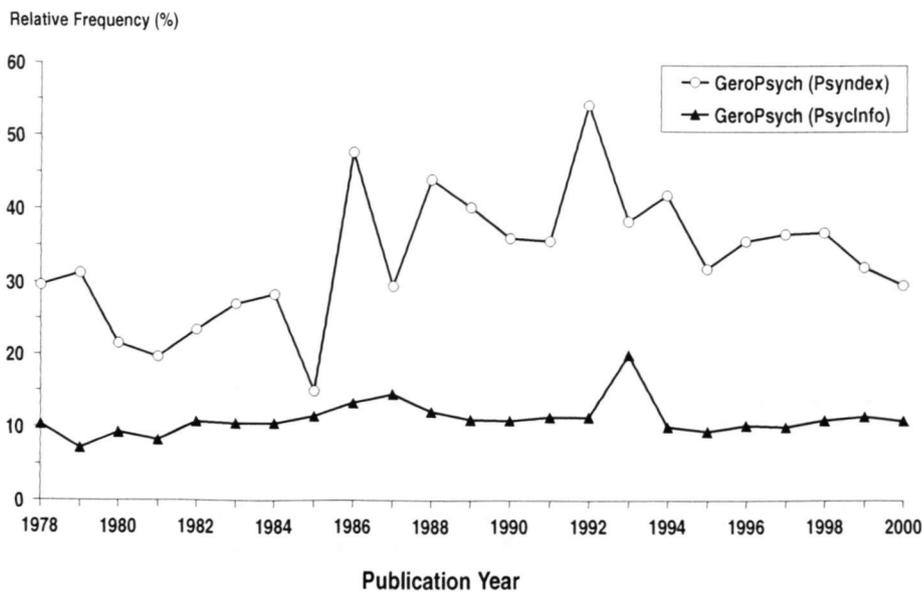


Figure 3. Relative frequencies of geropsychology literature citations of all developmental psychology literature citations 1978–2000 in PsycInfo and Psyindex.

speaking countries. This trend cannot be observed in the Anglo-American region. Another difference between both regions is reflected in the relative frequency of the developmental psychology literature, which tends to be lower in German-speaking countries, oscillating across the observation period somewhat, but remaining close to five percent. Finally, the proportion of research dedicated to experimental psychology in the German-speaking region tends to be higher, but reveals a similar developmental trajectory compared to the Anglo-American region.

Next, we were interested in the contribution of the geropsychology literature to the developmental psychology in total (that is, *including* all ages). As can be seen in Figure 3, there is a clear difference between the Anglo-American and German geropsychology in this regard. While geropsychology

logical publications in the Anglo-American region rather consistently constitute ten percent of the total developmental psychology literature (with the exception of one publication year, 1993), the geropsychological literature from German-speaking countries consistently amounts to much more of the developmental literature, peaking at about 50% in the early nineties (1992). Furthermore, although there is much fluctuation in the literature development in the German-speaking region, it has tended to increase since 1978. Hence, particularly in German-speaking countries, geropsychology has become a very substantial portion of the developmental psychology literature since 1978, comprising between roughly 30 to 50% of the developmental literature since the second half of the 1980s. This trend is less clear in the Anglo-American region.

Tabelle 1. Export and import of geropsychology (1977–2000).

Other psychology subfield	PsycInfo		Psyindex	
	Export of geropsychology (%)	Import of geropsychology (%)	Export of geropsychology (%)	Import of geropsychology (%)
Experimental psychology	0.1	1.2	1.3	3.1
Social psychology	0.3	0.5	1.2	0.8
Personality psychology	0.7	3.5	1.7	2.7
Clinical psychology	0.1	5.2	2.6	21.1
Educational psychology	0.1	0.8	0.8	1.6
Environmental psychology	0.3	0.07	0.4	0.05
Sport psychology and leisure	0.6	0.4	2.9	1.3
I&O psychology	0.2	0.9	0.9	0.7
Psychometrics	0.7	6.0	1.1	1.8
Total	3.1	18.6	12.9	33.2

As a final issue of the external perspective of our analysis, the issue of import versus export, that is, interactions between geropsychology and a variety of other psychology subfields were analyzed separately for the Anglo-American and German-speaking region. Table 1 clearly illustrates that geropsychology research refers to other psychology subfields (import of other psychology subfields into geropsychology) more often than other psychology subfields refer to geropsychology (export of geropsychology work into other psychology subfields). It should also be noted that the import rate is much higher in the German-speaking compared to the Anglo-American region. In the German literature, high import rates were observed in the field of clinical psychology (21.1% import rate vs. 5.2% in the Anglo-American literature). Conversely, the import rates in the field of psychometrics were much higher in the Anglo-American literature compared to the German literature (6.0% vs. 1.8% for the German literature). But at the same time, the export rate with respect to geropsy-

chology from German-speaking countries is consistently higher compared to the Anglo-American geropsychology across all psychology subfields considered in our analysis. Thus, while import is mostly and substantially provided by clinical psychology in the geropsychology of German-speaking countries, other psychology subfields tend to regard their work as being relevant in terms of geropsychology, at least more so than in the Anglo-American literature.

The "Internal Perspective": Development of major Subfields of Geropsychology

Figure 4 depicts the development of major subfields of geropsychology, based on a bibliometrical analyses covering the domains of cognitive functioning, life experiences/coping, life satisfaction/well-being, and behavioral competence. Not surprisingly, work on cognitive functioning consistently had the highest relative frequencies of all

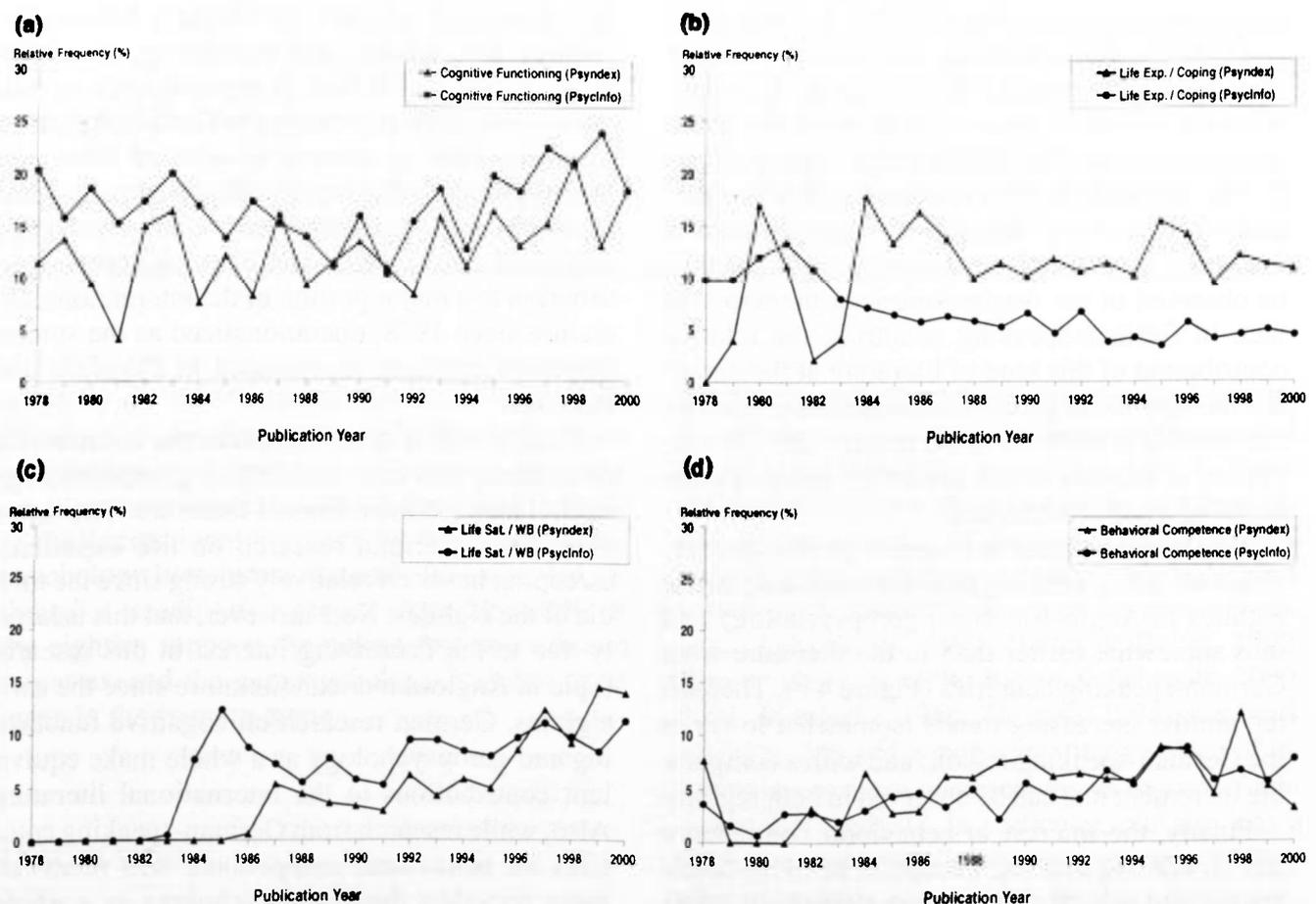


Figure 4. Relative frequencies of geropsychology subfields 1978–2000 in PsycInfo and Psycdex: Cognitive functioning (a), life experiences/coping (b), life satisfaction/well-being (c), and behavioral competence (d).

four geropsychology fields in the Anglo-American literature (Figure 4, a). Research on cognitive functioning appears to have slightly decreased during the early nineties, but has risen again since then. Conversely, geropsychology work on cognitive functioning in the German-speaking region has quite steadily increased since 1978, and has paralleled the percentage of its Anglo-American counterpart since 1990. One might speculate that this latter literature development reflects continued growing interest in cognitive issues, whereas the Anglo-American literature has already reached its peak level by the last quarter of the 20th century. Also, it is worth noting that the relative dominance of cognitive aging research is also evident in the German-speaking geropsychology landscape, but this applies only to a comparison with the subfields of life satisfaction/well-being and behavioral competence and not with the domain of life experiences/coping.

The field of life experiences/coping also shows the most pronounced difference between the Anglo-America and German-speaking region of all geropsychology subfields considered in this analysis (Figure 4, b). Whereas this area of research has remained consistently strong in German-speaking countries, amounting to about ten to fifteen percent since the middle of the eighties, clearly less Anglo-American research, below ten percent since the early eighties, has been devoted to this topic. In addition, a decreasing trend can also be observed in the Anglo-American literature. In fact, in German-speaking countries, the relative contribution of this kind of literature at the end of the nineties to the geropsychology total is roughly comparable to the level of the Anglo-American literature at the end of the seventies, before its decreasing trend commenced.

Substantial interest in research on life satisfaction/well-being first began at the beginning of the eighties in Anglo-American geropsychology and thus somewhat earlier than in the literature from German-speaking countries (Figure 4 c). Thereafter, similar increasing trends (somewhat lower in the German-speaking region) and with a comparable increment rate can be observed in both regions.

Finally, the interest in behavioral competence has remained (with one exception in 1998) below ten percent in both regions since 1978 (Figure 4 d). However, both regions also show a steadily growing interest in issues of behavioral competence,

which has even exceeded the relative contribution of the subfield life experiences/coping in the Anglo-American literature since the early nineties.

Contribution of Geropsychology from German-speaking Countries to the international Literature

First, we contrast the percentage of geropsychology from German-speaking countries with developmental psychology (excluding old age), experimental psychology, environmental psychology, as well as psychology as a whole from German-speaking countries. As can be observed in Figure 5, both German geropsychology and German environmental psychology, that is, both new, "trendy" and interdisciplinary psychology subfields, have clearly increased their contribution to the total literature since 1978. Also, both of these subfields of psychology reveal clearly higher percentages in this regards than experimental psychology (slightly above psychology as a whole), developmental psychology (slightly below psychology as a whole), and psychology as whole. Thus, it seems as if both geropsychology as well as environmental psychology in German-speaking countries were, in contrast to selected other psychology disciplines (experimental psychology and developmental psychology) as well as psychology as a whole, more successful in terms of their contribution to a major portion of the international literature since 1978, operationalized as the sum of literature citations represented in PsycInfo and Psynindex.

Finally, Figure 6 (a) illustrates the contribution of German literature on various geropsychology subfields to the international literature. The figure shows that German research on life experiences/coping has been relatively strong since the middle of the eighties. Note however, that this is largely due to the decreasing interest in this research topic in Anglo-American literature since the early eighties. German research on cognitive functioning and geropsychology as a whole make equivalent contributions to the international literature. Also, while research from German-speaking countries on behavioral competence was relatively more prevalent than geropsychology as a whole, especially from the end of the eighties to the early nineties, the frequency of publications dropped

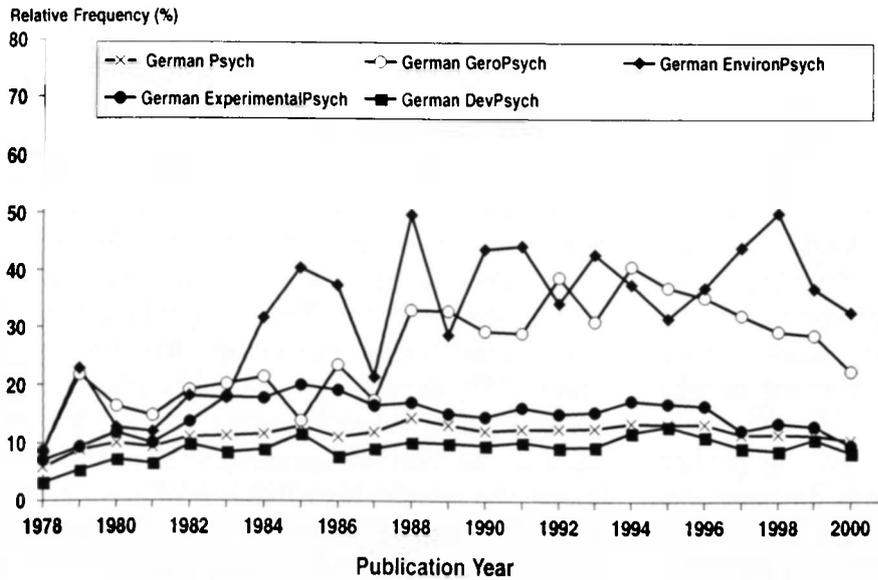


Figure 5. Relative frequencies of geropsychology, psychology, developmental psychology, environmental psychology, and general psychology from German-speaking countries of the according international literature (Psyindex + Psy-Info).

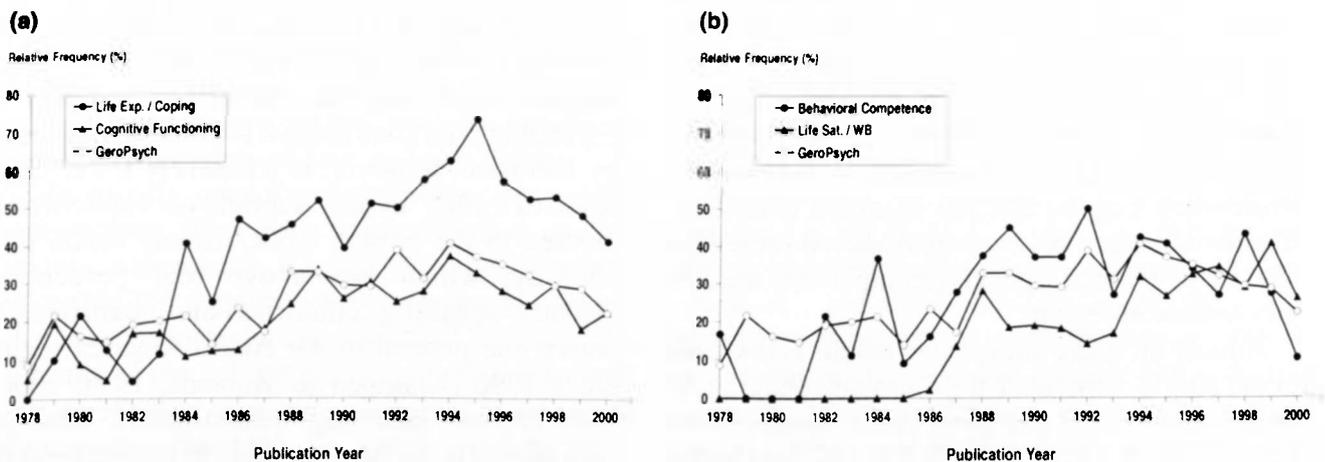


Figure 6. Relative frequencies of geropsychology subfields from German-speaking countries of the according international literature (Psyindex + PsyInfo).

again by the middle of the nineties (Figure 6, b). Finally, the contribution made by research on life satisfaction/well-being from German-speaking countries was equivalent to the contribution made to the international literature by the general geropsychology literature at the end of the nineties, although a steadily rising trend since the middle of the eighties supports the notion that this subfield might exceed the geropsychology literature total mean in the years to come.

Discussion

Geropsychology has reached a stage of mature development at the close of the 20th century, having

left behind what Birren (1961a) has called its early period, the beginning of systematic studies period, the phase of expansion as well as a period of consolidation roughly ending around the middle to the end of the seventies of the last century. While a body of work has followed a narrative review track regarding the historical details of this development (e.g., Achenbaum, 1995; Baltes & Baltes, 1992; Birren, 1961a, b, 1996; Birren & Schroots, 2000, 2001; Munnichs, 1966; Thomae, 1994), our work was aimed to add a more quantitative piece of information to these historical views by use of bibliometrical analysis. In particular, our aim was a bibliometrical analysis of recent geropsychology after its consolidation driven by three guiding issues: First, we were interested in the "external perspective," that is, the development of geropsychol-

ogy against the background of psychology as a whole as well as selected other psychology subfields. Second, from an "internal perspective," the basic question was how major subfields of geropsychology have developed during the last quarter of the 20th century. With regard to both of these issues, comparisons between the Anglo-American and German-speaking research community were drawn. Third and finally, we explored the relative contribution of geropsychology work coming from German-speaking countries to the international literature.

Our findings were largely unsurprising, but here and there some unexpected trends did appear as well. To begin with, both literature bodies have steadily grown, in absolute terms, since the beginning of the last quarter of the 20th century. The geropsychology literature in German-speaking countries has grown faster than the Anglo-American literature. The most likely reason for this is a time delay in the evolution of geropsychology research in German-speaking countries. Another interpretation may be that the so-called consolidation period of geropsychology occurred somewhat later in the German-speaking compared to the Anglo-American region.

Among the more unexpected results is that both in the Anglo-American and German-speaking research community, the geropsychology literature has remained relatively stable in absolute terms since the late eighties. With respect to this plateau phase of geropsychology publication activity, at least two interpretations, a more positive and a more negative one, seem reasonable to us. From a more positive point of view, reaching the plateau reflects the beginning of a mature science period, producing a constant output on the relative highest level since its unfolding as a scientific discipline. A more negative explanation for this trend might, however, lie in the development of personal and institutional resources devoted to geropsychology research across the years in the Anglo-American and German-speaking region. After an initial period of growth and progress, marked by an enthusiasm from the scientific community and generous governmental funding, resources may have become exhausted by the middle of the 1980s (relatively early in Germany, assuming a delay in the development of the geropsychology field in Europe). As a consequence, this might have depressed the possibility

of growth in the literature production of both regions.

In terms of a relative frequency view from the "external perspective," our findings support the notion that geropsychology has found a clear and stable position within psychology as a whole in both research communities, contributing between one to three percent to the overall psychology literature since 1978. In German-speaking countries, the overall higher percentage has even grown since 1978, supporting again our suspicion that the consolidation period of geropsychology has come later to the German-speaking region. In both regions, the relative contributions of geropsychology to the total psychology literature were also clearly and consistently higher compared to environmental psychology. One might take this at least as partial support for the hypothesis that geropsychology has been rather successful compared to another trendy and interdisciplinary subfield of psychology. Its contribution to the total psychology literature, however, is tentatively lower compared to a third "trendy" subfield not explicitly addressed in the present work, namely health psychology, which lies above four percent in German-speaking countries and significantly above one percent in the Anglo-America region since 1990 (Krampen & Montada, 1998, 2000). Furthermore, additional bibliometrical analyses (not shown in the present work) demonstrate quite clearly that geropsychology plays only a marginal role compared to other classic basic and applied disciplines (such as personality psychology or clinical psychology).

Differences between both regions were found in regards to the relative contribution of geropsychology to developmental psychology as a whole, which was much higher in German-speaking countries. The major explanation for this may lie in the strong child psychology tradition in North America thus downsizing the overall developmental psychology proportion of the Anglo-American geropsychological literature. This assumption is supported by the observation that in this body of literature, developmental psychology (excluding aging research) makes up a greater share of the total psychology literature compared to the German-speaking region.

Furthermore, in terms of import and export of geropsychology, it seems as if geropsychology has imported much more than it has exported to other

psychology subfields between 1977 and 2000. German-speaking research, in particular, imports relatively more research from the field of clinical psychology. This result might indicate that geropsychology in German-speaking countries is driven more by applied psychology subfields (particularly clinical psychology) compared to Anglo-American geropsychology. In general, a much stronger import than export balance is probably a typical phenomenon for relatively young fields in psychology. It has, for example, also been found for health psychology (Krampen & Montada, 2000). In the longer run, however, the growing importance of aging acknowledged by a variety of psychological subdisciplines makes the export of geropsychological research critical to its scientific standing within its parent discipline. Currently, the export trend is more pronounced in the German-speaking research community, but is still quite low overall.

The "internal perspective" analysis was based on the development of four geropsychology subfields, namely cognitive functioning, life experiences/coping, life satisfaction/well-being, and behavioral competence. It probably comes as no surprise that the cognitive aging literature tends to play the most pronounced role of all four domains in terms of the geropsychology literature in both regions. Differences were detected, however, in the development of the life experiences/coping literature, which was clearly lower and decreasing in the Anglo-America region and higher and quite stable in the German-speaking region. It thus seems as if the Anglo-American quantitative literature development supports the view of a progressively diminishing interest in issues of critical life events and coping efforts, while this is not true for German-speaking countries. The remaining three subfields revealed a marked increase since the early eighties in both research communities, with the literature on life satisfaction/well-being comprising a greater share of research compared to behavioral competence.

Finally, with respect to the relative contribution of the German geropsychology literature to the international literature in quantitative terms, the good news is that geropsychology (like environmental psychology) from German-speaking countries contributes more to the international research than the German psychology literature as whole since the early eighties of the last century. It is also

important to note in this regard, that the proportion of geropsychology literature from German-speaking countries written in English language has clearly risen since the early 1990s (Wahl & Kruse, 1999). Differences between the four geropsychology subfields considered in this analysis, in terms of how much each German body of research contributed to the international literature, were less clear. The "winner" at first glance, namely the literature on life experiences and coping, must be seen against the background of a decreasing interest in that research field in the Anglo-American literature. All three other subfields fluctuated slightly around the mean observed for the geropsychology literature.

In conclusion, the most important general implication of our bibliometrical analysis from the "external perspective" is that geropsychology has found a stable position within psychology as a whole during the last quarter of the 20th century both in the Anglo-American and German-speaking research community, while its contribution to developmental psychology is much more pronounced in the latter. From an "internal perspective," research on cognitive functioning contributed most – and most consistently – to the overall geropsychology literature production in both regions, but again, this is true only relative to the four geropsychology subfields selected for the present work. The most striking difference between both regions in this perspective was the diverging interest in research on life experiences and coping (which was still much higher in German-speaking countries). Finally, our findings support the notion that German geropsychological research has enjoyed more international success than other psychological fields, since its mean rate of publication lies clearly above the mean observed for psychological research as a whole.

Obviously, bibliometrical analyses of the kind presented here provide only a limited tool for historical analysis of the geropsychology development. For example, it is not easy to address all the relevant geropsychology literature with the right key terms and different combinations of such key terms frequently result in quite different quantitative portions. Seen from a more general level, bibliometric analysis can tell us something about the growth of a science, but it affords only a very coarse picture and says nothing, for example, of the "good" or "bad" ideas or methods inherent to

branches of scientific inquiry. It might also be worth the effort to complement such an analysis by taking advantage of other means of quantitative literature analysis such as citations rate analysis (e.g., Fischer, 2000), which were beyond the scope of this paper. On the other hand, taken together with narrative historical perspectives, bibliometrical analyses can add to a more comprehensive and multi-faceted view of scientific evolution. Referring again to geropsychology, the value of such an analysis is that it is able to support in quantitative terms what already is felt in the scientific field, but some unexpected trends were also identifiable. Our hope thus is that this set of findings might stimulate further reflections on the future needs and potentials of geropsychology both in Germany and the U. S.

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