

# Restructuring the Bachelor of Exercise Science degree to meet industry needs

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This paper examines the restructuring of the Bachelor of Exercise Science at Griffith University, Queensland, Australia over a fifteen-year period. The resulting changes have provided students with an improved educational experience through greater choice in course selection to meet their individual academic objectives. This case study emphasizes the importance of regular reviews to ensure university programs remain responsive to student interests and, most importantly, meet the needs of industry and employing groups. (*Asia-Pacific Journal of Cooperative Education*, 2010, 11(1), 13-25)

Key words: restructuring, exercise/psychological science, industry needs, physical education

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## INTRODUCTION

The Bachelor of Exercise Science was introduced in 1995 to prepare graduates to meet emerging employment needs for specialist practitioners in Exercise Science. Crucial to the development of the program was its importance in the proposed graduate entry Physiotherapy program, which commenced in 1999. The program was constructed to also meet the needs of the wider community in the areas of ageing and specialist sporting initiatives. The first graduates completed their studies in 1997. At that time, changes were made to the program based on the results of a graduate survey and focus group discussions. The courses offered in the program have changed significantly since its introduction. The number of commencing students has increased considerably with the degree being incorporated into a number of double/combined degree programs offered by the School. In 2010, significant changes in the curriculum will be introduced to provide third year students with more electives to assist in creating opportunities for employment.

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## HIGHER EDUCATION AND EMPLOYMENT

The relationships between education and the economy have been publicly debated from different perspectives since the introduction of mass education (Dewey, 1916; Illich, 1976; Gee, 1994). In general, since the early twentieth century, education has been perceived as a means to deliver economic, as well as socio-political outcomes (Wagner, Childs & Houlbrook, 2001). From schools to universities, the inclusion of 'work' is seen as a major advance towards a more economically viable output (that is employable school leavers and graduates) (Ball, 1999; Spark, 1999; Cumming & Carbines, 1997). Institutions of higher education are under increasing pressure to prepare graduates for the work environment by including a component on work-integrated learning to achieve the expectations of society (Spowart, 2006). One of the roles of higher education is to provide society with individuals who are trained so that they can respond to the demands of knowledge-based occupations (Svelby, 1997; Goncz, 1994; Council for Higher Education, South Africa, 2001), as well as demonstrating the skills necessary for participating in a global economy. A present trend exists whereby university students expect a pay-off from their investment in education (Abeysekera, 2006). Thus, it could be argued that students in today's world tend to seek vocationally oriented courses (Coll & Eames, 2007). This approach will attract students by the re-marketing of traditional academic courses as vocationally oriented courses. Many universities have taken this opportunity to offer programs of study that students will appreciate and that will also enhance the branding of the university.

Higher education in Australia assists in achieving the Government's vision of a stronger and fairer Australia. It promotes economic development, productivity and high skill jobs and supports Australia's role as a leader in the area. To be globally competitive and to secure the high skill jobs of the future, Australia needs an outstanding, internationally competitive higher education system with increased participation and higher attainment levels (Australian Government, 2009). "Today's challenging economic situation means that it is no longer sufficient for a new graduate to have knowledge of an academic subject; increasingly it is necessary for students to gain those skills which will enhance their prospects of employment" (Fallows & Steven, 2000, p.75).

The present Australian government seeks to build a first class education system, which recognises the central role that education plays in the economic and social strength of the nation (Department of Employment, Science and Training, 2008). The Australian higher education system contributes significantly to the future of Australia through educating the future professional workforce, creating future leaders, providing jobs for Australians, driving economic success, as well as assisting in the development of cultural and trade links with other countries. The sector plays a significant role in the developing knowledge and innovation-based economic health of Australia (Illich & Verne, 1976).

## RESTRUCTURING UNDERGRADUATE PROGRAMS

When universities undertake reviews of their undergraduate degree programs, they tend to focus on inputs (school leavers, university entrants) and then heavily on the transformation required (what knowledge and skills need to be taught). This paper concurs with the

argument expressed by McKay and Marshall (2007) that “a greater focus on outcomes in terms of the attributes, skills and knowledge required, driven by industry demand, provides a focus which is likely to result in the shaping of curricula that is more likely to produce graduates more closely aligned to the needs of industry”. Therefore, degree reviews and restructures need to be responsive to the interests of the student intake into a degree, but should also ensure that graduates are meeting the needs of industry (McKay & Marshall, 2007).

There are several motivations behind the restructuring of undergraduate degree programs. Perhaps the most common is to improve the educational experience of the students. Changes in the curriculum also allow students more flexibility to select courses to meet their academic objectives. Thirdly, the restructured program can be expected to produce highly qualified graduates who are competitive in the job market.

## CASE STUDY

Griffith University has several campuses in Brisbane and the Gold Coast, Queensland. Griffith University’s teaching and learning programs aim to provide opportunities for students to acquire knowledge and skills that can be applied in the community. Griffith aims to include work-integrated learning in at least 70% of all degree programs by 2010 (Griffith University, 2006). This study will focus on the various reviews and restructures that have taken place in regard to the Bachelor of Exercise Science at Griffith over a fifteen year period in order to meet the needs of industry and provide employment opportunities for students. Content analysis formed the basis for the research methodology employed in the study. All School and Faculty documents related to the degree since the degree program commenced were analysed.

The Bachelor of Exercise Science was introduced in 1995 at the Gold Coast campus of Griffith University to prepare graduates to meet emerging employment needs for specialist practitioners in Exercise Science (Table 1). Crucial to the development of the program was its importance in the proposed graduate entry Physiotherapy program, which commenced in 1999. The program was constructed to also meet the needs of the wider community in the areas of ageing and specialist sporting initiatives. A significant emphasis on job prospects was obvious in early development of the program.

I am totally convinced that our way to improve the quality of students coming to Griffith University is through the promotion of our programs that lead to serious career jobs.....indeed it is my view that all courses/schools should be able to clearly demonstrate the potential job prospects of their graduates (Griffith University, 1997, *Memorandum from the Head of the School of Exercise Science*).

TABLE 1

Major milestone summary of the Griffith University Bachelor of Exercise Science (see text for details)

Year	Undergraduate	Postgraduate
1995	BExSci introduced	
1997	BExSci / B Business introduced BExSci / B Education introduced	
1999	BExSci / B Physiotherapy introduced	Master of Physiotherapy introduced
2001	BExSci / B Psychology introduced	
2007	Health Faculty Foundation First Year introduced	
2009	BExSci (Pre-physiotherapy) introduced	Grad Cert and Masters of Sports Coaching introduced
2010	Major program restructure, career streams introduced	
2011		Master of Sports Medicine planned introduction
2012		Doctor of Physiotherapy planned introduction

#### BACHELOR OF EXERCISE SCIENCE/BACHELOR OF EDUCATION

In 1997, the Bachelor of Exercise Science expanded into the first of several double degree programs. The Bachelor of Exercise Science/Bachelor of Education was a 4.5 year program that “provided graduates with an opportunity to acquire specialist knowledge and skills in education, thereby affording additional employment prospects within the field of secondary school teaching” (Griffith University, 1996a, p.1). This program was later replaced in 2006 by a one-year Graduate Diploma of Education. The second double degree program also commenced in 1997. The Bachelor of Exercise Science/Bachelor of Business (Sport Management) emphasized the importance of competitive employment for Griffith University graduates in the increasingly lucrative area of sport management.

Sporting organisations require managers who understand and appreciate the administrative implications of modern sport science. No longer is it accepted that those who once played the sport will successfully manage that sport. Specialist knowledge in business and exercise science is required of today’s managers of sport at all levels (Griffith University, 1996b, p.1).

## BACHELOR OF EXERCISE SCIENCE/BACHELOR OF BUSINESS

The combined Bachelor of Exercise Science/Bachelor of Business allowed students to add an increasingly important dimension to their skills and knowledge that was not available to them through the Bachelor of Exercise Science alone. Conversely, the combined degree provided sport management students with specialist knowledge in exercise science that is not available through the Bachelor of Business alone. The combined degree is expected to lead to career opportunities in the management of high performance sport and sport governance. Students completing the combined degree will be uniquely placed to assume leadership roles in the management of Australian sport.

## BACHELOR OF PHYSIOTHERAPY/BACHELOR OF EXERCISE SCIENCE

The five-year Bachelor of Physiotherapy/Bachelor of Exercise Science was introduced in 1999, along with a two-year Master of Physiotherapy program. This was the first undergraduate program in the world to link Exercise Science with Physiotherapy in an integrative and formal manner. This integration was designed to produce a unique graduate, who clearly understands the complexities of the exercise response and has also achieved a high standard of clinical competency in the practice of Physiotherapy. The demand for university places in the undergraduate double degree created a high admission standard with an Overall Position of 1 or 2 required (on a scale of 1-25) in the Queensland Year 12 Senior Certificate. This standard has remained over the last ten years due to the popularity of the course and the significant number of students applying for admission. In keeping with the change in employment emphasis, the School was renamed the School of Physiotherapy and Exercise Science (PES) in 1999.

## BACHELOR OF EXERCISE SCIENCE/BACHELOR OF ARTS (PSYCHOLOGY)

The Bachelor of Exercise Science/Bachelor of Arts (Psychology) was first offered in 2001 in partnership with the School of Applied Psychology. The course submission indicated “the combined degree will position graduates with the combined skill base in Psychology and Exercise Science to take advantage of the emerging employment markets in sport psychology and rehabilitation” (Griffith University, 2000, p. 2). In 2006, the name of the degree was changed to the Bachelor of Exercise Science/Bachelor of Psychological Science to provide a closer link to industry and employment. Additionally, a Bachelor of Exercise Science (Honours) was introduced in 2001, providing opportunity for research leading onto the Master of Philosophy and Doctor of Philosophy programs and the possibility of employment in research and academia.

The importance of being aware of changes in the needs of industry was demonstrated in the 2001 submission for minor change in the Bachelor of Exercise Science. “We must be proactive to the changing paradigms within Exercise Science ..... graduates have had good success in the cardiac technician employment market” (Griffith University, 2001, p.1). A second course in Clinical Exercise Testing was proposed in 2001 as an elective to consolidate and extend the competitive edge that had been developed through strong industry support for this particular segment of the degree program. Recent meetings with both private and public

employers in clinical exercise testing have indicated industry preference for Griffith graduates, providing a distinct career pathway for students.

In order to take advantage of strong employment possibilities in the sports coaching field, the Graduate Certificate in Sports Coaching and the Master of Sports Coaching were offered on a part-time basis in 2009 with an initial cohort of 24 students. The program submission indicated: "On graduating, students will be able to use their skills and knowledge to enhance their development as a high performance coach in their chosen sport both nationally and internationally" (Griffith University, 2008).

#### HEALTH FOUNDATION YEAR

A generic first year course structure was introduced into the Faculty of Health in 2007 which included the Schools of Physiotherapy and Exercise Science, Pharmacy, Dentistry and Oral Health and Medical Science. Foundation Year included eight common courses (subjects) designed to reduce course replication, improve content and teaching consistency and facilitate student transfer between programs after first year. Class sizes were significantly increased (n=600/course) and students no longer had course offerings specifically for their program of study.

#### BACHELOR OF EXERCISE SCIENCE (PRE-PHYSIOTHERAPY)

The Bachelor of Physiotherapy/ Bachelor of Exercise Science double degree was changed to the Bachelor of Exercise Science (Pre-Physiotherapy) in 2009, with the degree integrated with the proposed Doctor of Physiotherapy program due to commence in summer 2011 (subject to university and accreditation approval). These alterations resulted from developments in preferred models of higher education for the physiotherapy industry.

#### ENROLMENT INCREASES

The total undergraduate enrolments over the same period are indicated in Figure 2. These figures suggest the programs are perceived by students as providing significant potential for employment, with growth matched by available student places. The plateau in numbers has occurred due to restrictions on the number of student admissions into the programs. The enrolments in the BExSc/Ed program declined as it was replaced by the Diploma of Education (Secondary) in 2008 as a one-year postgraduate program following the completion of the BExSc. Figure 1 demonstrates changes in enrolments from 1997 to 2009 in the five programs offered by the School.

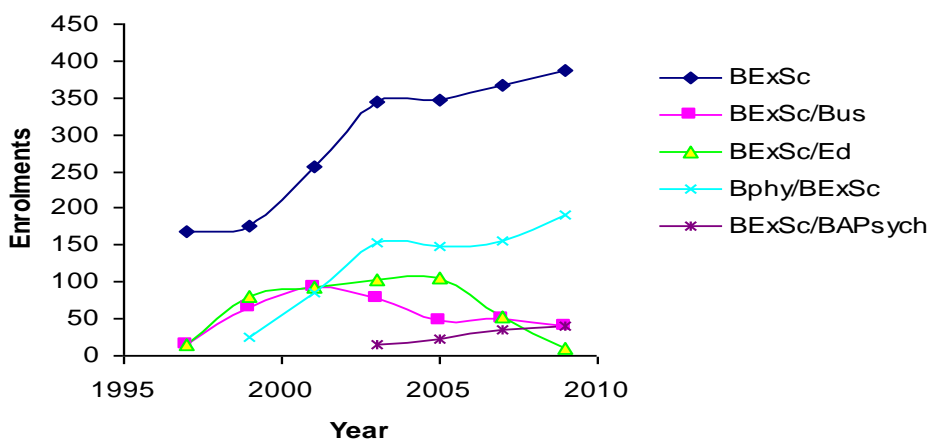


FIGURE 1  
Program enrolments 1997-2009

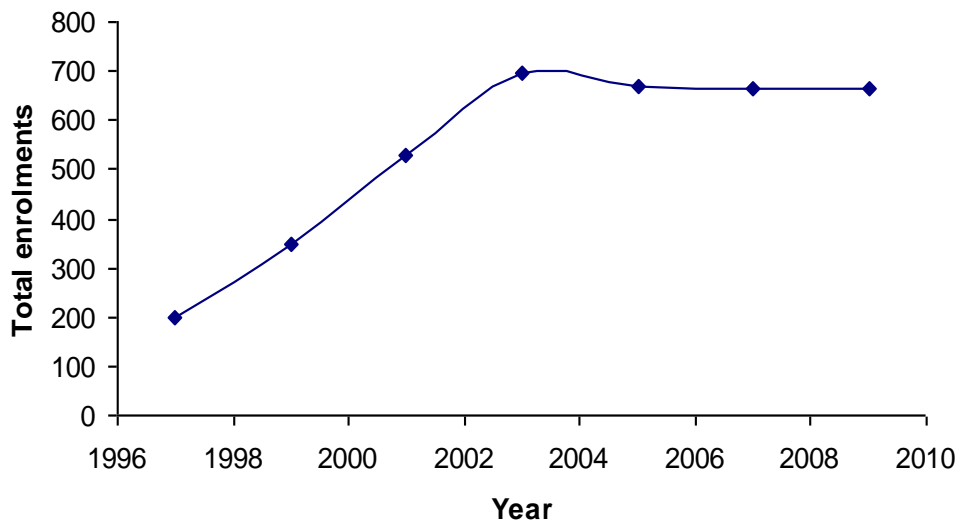


FIGURE 2  
Total PES student enrolments 1997-2009

## CHANGES FOR 2010

The structure of the Bachelor of Exercise Science will be significantly altered in 2010 to provide more electives and the possibility of discipline streams. This restructure articulates with the new Griffith University Graduate Attributes (2009) which states:

Griffith University aims to prepare its graduates to be leaders in their fields by being:-

- Knowledgeable and Skilled in their Disciplines
- Effective Communicators and Team Members
- Innovative and Creative, with Critical Judgement
- Socially Responsible and Engaged in their Communities
- Competent in Culturally Diverse and International Environments (2009, p.1)

An Introduction to Exercise and Sport Science course will be introduced in semester one of first year so that students are made aware of the possible areas of study and career paths available through the degree program. Additionally, one elective course will be offered in both semesters of Year 2, whilst students entering the third year of the program will be able to elect three courses (out of four) each semester. This restructuring will provide a total of eight electives, compared with the present scenario whereby students can only elect two courses in their degree. Table 2 outlines the career pathways/ streams for 2010 with suggested courses and post-graduate options. Each stream is briefly described thereafter.

Exercise Science students interested in pursuing a career in physiotherapy would be encouraged to complete specific electives to ensure they meet all the prerequisites for the Doctor of Physiotherapy program and accreditation requirements. The pathway into physiotherapy is a natural progression for students in the Bachelor of Exercise Science program, particularly since the introduction of the Master of Physiotherapy, which is registered with the Australian Physiotherapy Association, and the renaming of the School in 1999.

The second stream of clinical and applied physiology is aimed at students interested in the diagnosis, testing and treatment of people living with chronic disease, disability or injury. Currently Exercise and Sports Science Australia (ESSA), formerly the Australian Association for Exercise and Sports Science, accredits both exercise scientists (3-year trained) and exercise physiologists (4-year trained). The role of exercise professionals was formally recognised in Australia when, on 1 January 2006, the Department of Health and Ageing added exercise physiologists into the domain of allied health practitioners able to deliver rebated exercise services within the health care system. The Bachelor of Exercise Science program will continue to align with ESSA guidelines for exercise professions with expanded postgraduate programs in clinical science planned.



TABLE 2 :Career Pathways and Streams

	DISCIPLINE			STREAMS			
	PHYSIOTHERAPY	PHYSIOLOGY (Clinical or applied)	SPORTS COACHING	SPORTS NUTRITION	BIOMECHANICS (Clinical/ applied)	FITNESS/ PERSONAL TRAINING	EDUCATION
Careers	Physiotherapist	Exercise scientist Cardiac scientist	Sports coach/ Sports development officer	Sports nutritionist/ Dietician	Clinical or sports biomechanist	Strength & conditioning specialist/ Personal trainer	Secondary school HPE/ science teacher
2 <sup>nd</sup> Year courses	Pre-physio major structure	Bio-instrumentation Exercise & sports nutrition	Sports coaching Exercise & sports nutrition	Nutrition Exercise & sports nutrition	Bio-instrumentation Mathematics & statistics for clinical sciences	Sports coaching Exercise & sports nutrition	Sports coaching Mathematics & statistics for clinical sciences
3 <sup>rd</sup> Year courses	Pre-physio major structure	Clinical exercise testing Injury prevention & management Neuroscience 1 Cardiovascular science or Biomechanics 2	Injury prevention & management Health & exercise organizations Field Project	Clinical exercise testing Pharmacology Health & exercise organizations Research project/ field project Physical activity promotion	Biomechanics 2 Neuroscience 1 Injury prevention & management Neuroscience 2 Research project	Injury prevention & management Fitness practicum 1 Health & exercise organizations Field Project Fitness practicum 2	Select courses for HPE teaching Other teaching area (physics, chemistry, biology, mathematics)
Post-graduate options	Doctor of physiotherapy Medicine PhD	Honours PhD Master of Clinical Science Medicine	M Sports Coaching PhD	M Nutrition & Dietetics PhD	Honours PhD		Graduate Diploma of Education (Secondary)

The challenge of producing excellence in sport is now well recognized as requiring highly skilled and qualified coaches who can successfully blend the theory of exercise science with the practices of those involved in elite level sport. High performance coaches also need skills in leadership and management to coordinate a large and complex group of people who contribute to the development of athletes and teams. The sports coaching discipline stream offers electives to enhance students' employment opportunities in sports coaching and rehabilitation. The introduction of the Graduate Certificate and Master of Sports Coaching will provide career pathways for Exercise Science students as senior or high performance coaches in their chosen sport or as coach educators within their governing bodies. The skills developed in the program are transferable and can be applied to a wide range of careers. Students in this discipline stream can also pursue studies for Honours or a Doctor of Philosophy and thereby enhance their potential for a career as an academic.

The Master of Nutrition and Dietetics is fully accredited by the Dietitians' Association of Australia, enabling graduates to become professional members of Australia's peak nutrition professional association and work as an Accredited Practising Dietician (APD). Graduates will find employment in a range of roles in a range of sectors. These roles will include work as a dietician/nutritionist in private and public hospitals, community health services, health promotion and public health units and/or in private practice. Opportunities have grown considerably for entrepreneurial dietitians working on a consulting basis to the food and pharmaceutical industries.

Biomechanics is the study of the laws of physics as applied to physical activity, exercise and sport. Biomechanics can be used to explain how muscles, bones and joints react under certain conditions and to improve performance using motion analysis techniques. Through scientific analysis of sporting technique, a sports biomechanist can provide valuable guidance to athletes to improve their skills and ultimately performance. Biomechanists have a close working relationship with coaches, athletes and sports science staff, as they need to import and implement new concepts and technology in order to develop cutting edge training and competition strategies, e.g. the use of computer and video technology aimed at the systematic collection of data and the application of this data to improve athlete performance. Biomechanists are usually employed at sports institutes or with professional sporting teams.

The fitness industry provides numerous employment opportunities for Exercise Science graduates, particularly in the areas of personal training and strength and conditioning. Personal trainers work in a variety of settings, such as gyms, health clubs, spas and cruise ships. Hours are flexible and usually include some night or weekend work. Personal trainers assess fitness levels and help their clients design a fitness regimen to help them safely achieve their personal goals. Personal trainers are usually required to obtain certification in personal training, weight training or aerobics instruction. Strength and conditioning specialists utilise coaching skills and new coaching technologies to enhance sports performance, particularly with elite athletes. They identify the stages of periodization and design, teach and access strength and conditioning programs that maximise athlete performance, whilst considering the appropriateness of training for the long-term development of the athlete. This stream is expected to appeal to students with vocational skills/ experience and no desire to undertake postgraduate education.

Exercise Science students with an interest in teaching are able to complete a Graduate Diploma in Education (Secondary), leading to a satisfying career teaching Health and Physical Education, Science or Mathematics at the secondary level in public and private schools. Graduates are eligible to apply for registration with the Queensland College of Teachers, which is recognised nationally and internationally. Current demand for maths and science teachers remains high.

The development of these discipline streams with recommended course and postgraduate options aims to provide early and identifiable career paths, which students can pursue following the completion of their common first year. This restructuring aims to enhance the confidence of students to gain employment in their chosen fields through the development of skills and attributes desired by industry.

#### CHALLENGES: PAST AND PRESENT

The structure and restructure of the Bachelor of Exercise Science has faced significant challenges, with more expected into the future. As shown in Figure 2, total enrolments tripled between 1997 and 2003. However, this growth in student numbers was not always matched by staffing and resources. The increase in class sizes adds pressure to infrastructure, sessional budgets and teaching loads in the classic research-teaching nexus of academic activity. Teaching and learning performance have come under increasing scrutiny with the focus on student retention and program satisfaction as key performance indicators for the university, as well as course and teaching student evaluations for individual academics (Crosling, Heagney, & Thomas, 2009). Significant change has also occurred in student expectations of the institution, their program and its teaching, with current Generation Y students challenging many established teaching and learning practices (Twenge, 2009). The Australian higher education sector is about to undergo significant growth and diversification with the implementation of the Bradley review in 2008 (Australian Government, 2008) which sets a target of 40% of 25-34 year olds obtaining a Bachelor level qualification by 2020, including increased participation by low-socioeconomic background students. This increased participation rate combined with the change to a “voucher” system, whereby students make the choice to attend their favoured institution (subsequently followed by funding), will see a new model of program marketing with challenges to balance entry standards, retention rates and budget loads.

#### CONCLUDING REMARKS

This paper has presented a case study of the restructuring of a Bachelor of Exercise Science degree at an Australian University over a 15 year period. The process of restructuring has resulted in a new program that aims to more appropriately meet the needs of industry. The increase in career pathways available has been a very positive outcome for graduates of the program. Universities need to provide students with opportunities to gain those skills which will enhance their prospects of employment. Programs need to be responsive to the interests of students, but should also ensure that graduates are closely associated with the needs of industry. The authors hope that this case study will be informative and helpful for colleagues considering the restructuring of undergraduate programs, particularly in Exercise Science or related fields.

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The Asia-Pacific Journal of Cooperative education (APJCE) arose from a desire to produce an international forum for discussion of cooperative education, or work integrated learning (WIL), issues for practitioners in the Asia-Pacific region and is intended to provide a mechanism for the dissemination of research, best practice and innovation in work-integrated learning. The journal maintains close links to the biennial Asia-Pacific regional conferences conducted by the World Association for Cooperative Education. In recognition of international trends in information technology, APJCE is produced solely in electronic form. Published papers are available as PDF files from the website, and manuscript submission, reviewing and publication is electronically based. In 2010, Australian Research Council (ARC), which administers the Excellence in Research (ERA) ranking system, awarded APJCE a 'B' ERA ranking (top 10-20%).

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Manuscripts and cover sheets (available from the website) should be forwarded electronically to the Editor-in-Chief. In order to ensure integrity of the review process authors' names should not appear on manuscripts. Manuscripts should be between 3,000 and 5,000 words, include pagination, be double-spaced with ample margins in times new-roman 12-point font and follow the style of the Publication Manual of the American Psychological Association in citations, referencing, tables and figures (see also, <http://www.apa.org/journals/faq.html>). The intended location of figures and diagrams, provided separately as high-quality files (e.g., JPG, TIFF or PICT), should be indicated in the manuscript. Figure and table captions, listed on a separate page at the end of the document, should be clear and concise and be understood without reference to the text.

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