

# Sport and exercise psychology in Korea: Three decades of growth

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## ABSTRACT

Sport and exercise psychology as an academic discipline and area of research experienced a significant development over the last century. As the field matures, interests in sport and exercise psychology research and practices spread across different cultures and geographic locations. Similar growth in interests could have been observed in South Korea, reflected by the increased numbers of researchers and research publications in the Korean Society of Sport Psychology (KSSP) and Korean Journal of Sport Psychology (KJSP). The current paper introduces the establishment and historical development of the KSSP, and analyzed research trends published in the KJSP (1990–2019) with regard to the topics, research design, and methodologies, etc. By reviewing 30 years of research, valuable insights, unique implications and practical suggestions for sport psychology, exercise psychology, and motor behavior could be suggested, which may contribute to further development of Asian and international sport psychology.

## 1. Brief history of Korean society of sport psychology (KSSP)

It is an honor to introduce Korean sport psychology research for the inaugural issue of the Asian Journal of Sport and Exercise Psychology (AJSEP), an official journal of Asian-South Pacific Sport and Exercise Psychology (ASPASP). Although some of Korean sport psychology scholars have appeared in the Sport Psychology Source Book (Salamela, 1992), general information of the KSSP was not introduced until 2000 when the 3rd edition of the Source Book (Salamela, 2003) was published. In that book, the general information regarding the Korean Society of Sport Psychology (KSSP) and Korean Journal of Sport Psychology (KJSP) had been revealed to the world of sport psychology.

In this meaningful issue, it would be an order to properly introduce the establishment of the KSSP and the publication of the KJSP. Although several years of painstaking preparations and discussions preceded, it was March in 1990 when the official organization (KSSP) and official journal (KJSP) for sport psychology were born in Korea. That is, less than 40 personnel including professors, researchers from sport institutes and graduate students promoted the formation of a new academic organization on sport psychology and successfully launched its first publication with seven articles.

Since then, we have made lots of efforts to expand the members, the quantity of article submission and to improve the quality of the journal. Our efforts have brought abundant fruits. That is, now we have nearly 350 paid members (the year 2020) in our society and the numbers of the articles drastically increased and the quality of the articles also have been improved to such a level that we could satisfy. Thus, it is no wonder that, for five years consecutively, the KJSP has been selected as the most sophisticated and advanced journal in sport sciences & PE

areas and one of the top 10 journals in all areas of the Korean academia (based on Korea Citation Index) by the National Research Foundation in Korea (NRF), a governmental administrative organization to evaluate all academic organizations and journals in Korea. Our next goal is to be one of the five best academic journals in Korea and to be indexed in the Scopus and the ISI journal lists.

Another important stride in terms of academic development was that the exercise psychology discipline was introduced to KSSP in 1994 (Han, 1994). Thereafter, exercise psychology has attracted more notices to the society members, which has resulted in rapid and explosive growth in terms of the interests and number of studies published in the KJSP. The details will be described in the following section (i.e., exercise psychology).

In addition, we have made considerable progress in terms of organizing international congress on sport psychology. For example, we hosted the 3rd ASPASP Congress in Seoul in 2003 and the 7th ASPASP Congress again with the ISSP MC meeting in Daegu in 2018.

Furthermore, the most significant advancement in our society is believed that we have developed and setting up the sport psychology consultant program. In 2004, the KSSP launched this program using a grandparenting system and have carried out its 29th Sport Psychological counselor Qualification Training on February in 2021. The program provides a three-level qualification. A Level 1 sport psychology consultant reflects accreditation at the highest level, and is required to have (1) gained a doctoral degree in sport psychology or a related field, or Level 2 certification; (2) completed a specific educational curriculum; (3) passed the Level 1 exam; (4) completed a practicum under a certified supervisor of 200 hrs, delivered two oral case presentations in academic conferences; and (5) completed 50 hrs of workshops, seminars, and/or training courses recognized by KSSP. A Level 3 sport psychology con-

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stantant needs to have (1) gained certification associated with physical education or health/sport disciplines, or work experience in the sport and exercise-related field for two years; or (2) be a current college student majoring in physical education and/or a sport-related discipline; and (3) completed a specific educational curriculum, and (4) passed the Level 3 exam.

Currently, there are more than 800 certified sport psychology consultants at all levels including 33 certified sport psychology consultants (level 1), and they are working in various fields of sport from amateur to professional teams. They cover such individual sports as archery, amateur and pro golf, shooting, judo, rhythmic gymnastics, pro-baseball team, pro-volleyball team, pro-soccer team, and even for the handicapped athletes. They are also working for the general public who suffers from family conflicts, lack of learning motivation, attention, concentration, exercise burn-out, exercise addiction, etc. Some of them even opened his/her own office to provide sport psychological services for athletes and the public. It is said that these certified sport psychology consultants have contributed to promoting the psychological well-being, performance/learning enhancement, and lifestyle modification not only for the athletes but also for the public as well. The government has paid careful attention to this positive phenomenon and the government is trying to designate a certified sport psychology consultant as “one of the new professions for the future” although it is yet to be declared. If this is done, it will be a good example to show that sport psychology can create a new profession and to perform psychological service for sport for all. In addition, social and institutional support from the government will be possible by establishing a government-administered qualifying certification system for sport psychology consultants. It will be “one small step for the KSSP, one giant leap for Korean.” All efforts in order to supplement and improve KSSP are still in progress.

## 2. Research trends of the KJSP

In this section, we describe historical research trends in Korea including emerging themes in this discipline. For this, we have decided to review the articles published in KJSP. Since the KJSP was firstly published in 1990, a total of 981 articles had been reported until 2019. In the initial stage of writing, we went back through 30 years (1990-2019) of volumes, titles, keywords, and abstracts of the journal for the trends over the years. Through this process we identified that the majority of articles (49.6%,  $n = 487$ ) were published in sport psychology, 32.0% ( $n = 314$ ) for exercise psychology and 21.7% ( $n = 213$ ) for motor behavior including motor control, motor learning, and motor development.

In the first issue of the KJSP, only two articles out of seven belong to the field of sport psychology, while the rest of them do to motor learning and control. It was mainly due to the fact that the research interests of the leading researchers in Korea at that time were motor learning and control. The scholar majoring sport psychology was relatively rare, which leads to only a few articles. The KJSP was published bi-annually until 2001, three times in 2002 once, and quarterly since 2003 till today.

The average of articles published per year is 15.0 (1990-1999), 42.7 (2000-2009), 40.0 (2010-2019), respectively. Thus, the number of publications drastically increased from 2000 and has continuously increased. This phenomenon will be continued in the future. For example, as the total number of articles published in 2003 (quarterly publication, 4 issues) was 69 ( $M = 17.2/\text{issue}$ ), it would be safe to say that at least 10 articles per each No. were stably maintained with more than 40 articles annually. This rate of 40 articles per year is important because this number is regarded as the minimum to have the ability to propagate in the discipline (i.e., sport psychology) with its own academic knowledge.

To better understand the research trends of Korean sport psychology and more effectively deliver our writing, we divide our article into three sections: sport psychology, exercise psychology, and motor behavior because the KJSP's scope covers all these sections. Moreover, to achieve our objective of writing, each section was equally directed to review

documenting research topics and then describe emerging themes, with a deliberate focus on the rationale for studying these topics.

### 2.1. Sport psychology

As the number of articles belonging to sport psychology is overwhelming than other areas (e.g., exercise psychology, motor behavior) and because of the page limitation, we will take a look at the categories of the studies briefly rather than providing specific and detailed statistics, and then unique characteristics and interesting phenomena found in the KJSP will be discussed.

The whole articles can be divided into at the categories based upon study characteristics; 1) questionnaires/scales development ( $n = 76$ , 11.4%), 2) qualitative research including case studies ( $n = 126$ , 19.4%), 3) literature review ( $n = 43$ , 6.7%), 4) psychophysiological studies including experimental studies ( $n = 80$ , 16.7%), and 5) quantitative studies mainly using questionnaires ( $n = 247$ , 45.8%).

Questionnaire development includes the development of questionnaires, establishing a criterion of the questionnaires, examination of its validity, etc. It consists of three kinds of means; (1) to adapt foreign psychological questionnaires to Korean circumstances or to develop its own Korean psychological questionnaires, (2) to establish the criteria of the questionnaire, and (3) to examine the reliability and validity of the questionnaire. It covers diverse themes from motivation to emotion or addiction. The questionnaire related to motivation ( $n = 10$ , 15.4%) was the highest proportion and followed by personality ( $n = 6$ , 9.2%), stress, leadership, psychological skills ( $n = 5$ , 7.7%, respectively), group dynamics ( $n = 4$ , 6.2%), and competition state anxiety, self-confidence, self-administration ( $n = 3$ , 4.6%).

Qualitative research has been widely accepted in sport psychology literature in the Western countries after previous researchers had introduced and showed its applicability in the real sport circumstances (Gould, Eklund & Jackson, 1992; 1992a,b; Martens, 1987; Scanlan, Stein & Ravizza, 1991). The same trends took place in Korea as well. For example, researchers conducted qualitative research and showed meaningful results (e.g., Lee, Kim & Kim, 1999; Yoo & Park, 2000), which could not be gained from the quantitative method. It consists of the studies examining the effects of psychological skills training (PST) using case studies, exploring the structure of such factors as motivation, stressors, means to cope with mental pressures, mental toughness, leadership, burn-out, etc. using inductive content analysis. The former accounts for 36.2% ( $n = 38$ ), while the latter does 63.8% ( $n = 67$ ).

Forty percent of literature review papers are found during the 1990–1995 period ( $n = 14/35$ , 40%) and the rest were evenly distributed in terms of time perspective (i.e., year). These reviews have dealt with various themes such as motivation, emotion, attribution, group cohesion, qualitative research paradigm, psychological skills training, personality, self-efficacy, and cross-cultural research strategies, etc. These articles have contributed to the expansion of knowledge in sport psychology in Korea. For example, Kim and Han's study (Kim & Han, 1994) showed the strong points of using meta-analysis, Han (2002) warned about ill-considered predictive power of questionnaires, and Kim (2003) surveyed for Korean athletes in order to emphasize the necessity of providing psychological skills and sport psychology services for them. In addition, Yoo (2004) introduced theoretical paradigms that appeared in sport psychology and Shin and Kwon (2014) criticized imprudent usage of mediated model and pointed out incorrect interpretation on the results.

Psychophysiological studies encompass psychophysiological research and pure experimental research. Psychophysiological studies examined the interrelationships between sport psychological and physiological variables, while pure experiments described the experimental conducts in the real field environment without a questionnaire. Such variables as EEG, ERP, P300, HR, and blood pressure represent physiological variables. On the other hand, mental imagery, PST, bio-feedback, personality, competition anxiety, and emotion are common psycholog-

ical variables found in this study. Some examples of pure research variables include the expected flight direction of shuttlecock in badminton, decision making in soccer, endurance test in treadmill test, etc. Psychophysiological studies have resulted in potentially meaningful outcomes. For example, Shim (2004) compared EEG alpha activities between the stress relaxation training group and control group and found that the experimental group was able to maintain a more stable and efficient brain wave state during stressful conditions. Such results implied the possible benefits of PST with psychophysiological equipment on performance. This surely validates the use of PST from physiological perspectives as well. In addition, Woo (2009) also examined whether cardiovascular fitness activity mediates the relationship between genotype related to Alzheimer's disease (Apolipoprotein e4 allele) and neuro-electrical responses in young male adults. She found that highly fit subjects showed shorter latency in P300 at Pz than subjects with lower fitness levels. She suggested that those who are exposed to a high risk of Alzheimer's disease will get the benefit of cardiovascular fitness. This type of research has the potential power to contribute for the public and even for the population with cognitive deficiencies.

The quantitative method is the mainstream of sport psychology research in Korea. It accounts for 40% of all sport psychology studies and it is expected to be continued in the future. Initially, sport psychology researchers have adapted the questionnaires originated from Western countries to the Korean environment. Later, they have started developing their own questionnaires or scales tailored to specific domestic demands or sport characteristics. The studies using questionnaires have dealt with various themes, and almost all themes have been reported in quantitative studies. The most frequent themes are related to motivation and psychological skills, and followed by effects of PST, leadership, coping strategy, stress, personality, group dynamics, emotion, self-administration, and so on. Researchers tried to find or develop indigenous conceptual frameworks or questionnaires, resulting in some fruitful outcomes, indicating that *Wenness* is a unique team component and self-management is a unique individual component in Korean athletes (Huh, 2003; Park & Yoo, 2001). Recently many studies have examined the influence of mediated variables in motivation and learning as well. This implies that researchers have high interests in the mediated model in order to understand complicated interrelationships among variables.

## 2.2. Exercise psychology

The study on physical activity and psychological constructs, to be named exercise psychology, is a relatively new discipline that has its roots appropriately in the fields of the established disciplines such as sport psychology, social psychology, and epidemiology (Nigg & Jordan, 2005). In Korea, exercise psychology is especially young, compared to other psychology areas related to human movement behavior in sport science such as sport psychology and motor behavior. In addition to this, exercise psychology had not gained academic attention until Han's article (Han, 1994) on the topic was published in the KJSP. However, since the KJSP was firstly published in 1990, there has been considerable growth in the number of articles being published within the area of exercise psychology over time, with increases in academic interest among the KSSP members. Furthermore, the evidence of the increase in this discipline is apparent with the number of the published article in other Korean sport science journals such as *The Korean Journal of Physical Education*, a much larger complement of researchers, course offerings at many universities, and considerable research funding dedicated to the topic. A descriptive assessment of exercise psychology research over time is helpful to identify whether the content of our research has changed and how the research trend is.

Therefore, in this section, we review the articles which cover the exercise psychology themes published in the KJSP from 1990–2019. To accomplish our goal, we went back through all 30 years of volumes and recorded titles, keywords, and brief descriptions of physical activity and

psychological construct-related articles to understand research trends over the years within a timeline historical account.

### 2.2.1. The dawn of exercise psychology research: 1990–1999

As Weiss and Gill (2005) mentioned, the underlying theories and methods are common in both sport and exercise psychology contexts, and actual contexts are not so neatly divided into dichotomous categories. However, over the last 15 years, the articles published in the KJSP have sometimes been subdivided into sport psychology and exercise psychology, and both areas show a tendency to be clearly diverged in terms of thematic issues.

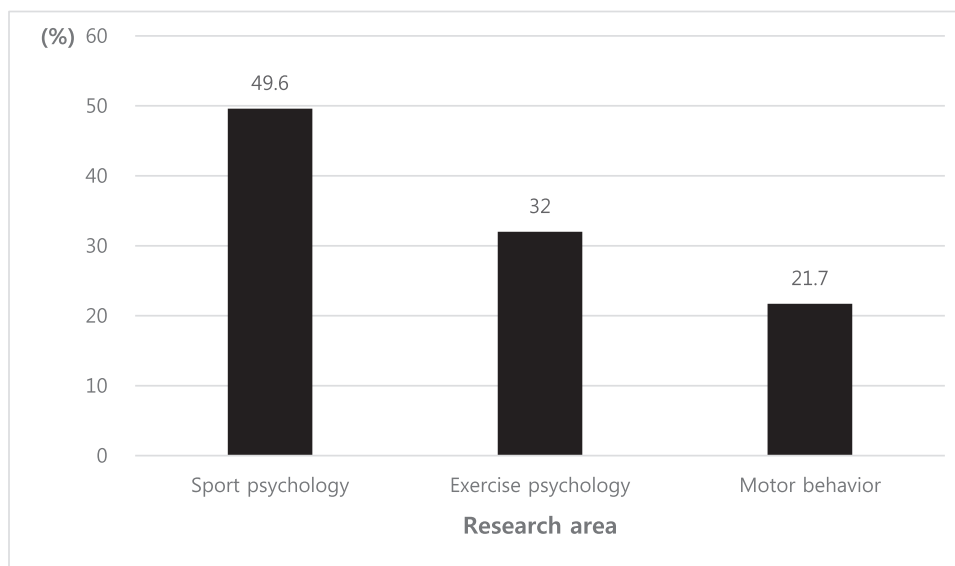
Since exercise psychology research emerged in the KJSP from 1990 to 1999, it has been rapidly and continually developed as a prospective research area in Korea. During the years a total of only 21 articles were published; even there was no article from 1990–1993. Most of those studies focused on health-related psychological benefits of physical activity participation such as mood state, stress, and happiness as well as exploring significance of motivation and physical self-concept in engaging in regular physical activity (Cheong & Choi, 1997; Yang, 1994; Yoo & So, 1998). In addition, some articles focused on measurement development and validation and measuring intrinsic motivation and emotional state which are regarded to be associated with participating in physical activities (Yang, 1998; Yoo, 1999). Meaningfully, one article by Han (1994) firstly tried to introduce the psychological effect of physical activity using meta-analysis. Although there was a very small number of exercise psychology research published in the KJSP during that period, it must be worthwhile not only to track down traces of Korean exercise psychology research, but also to be a backbone to predict future research trends in this area (Kim, Park, Kim, & Yoo, 2012b).

### 2.2.2. Various trials in exercise psychology research: 2000–2019

Over the last 20 years, a large number of studies have been conducted in the area of exercise psychology, and the research scopes and topics varied. Therefore, simple chronological descriptions of the studies in this area might not suitable to understand the variation of exercise psychology research over the years. Before discussing specific research trends and directions carried out in Korea and published in KJSP, it seems appropriate to share a common understanding of exercise psychology with readers first. Cardinal (2014) mentioned that exercise psychology is a vastly broad topic encompassing an array of disciplines, professions, and fields of study, including interdisciplinary collaborations and networks. In addition to this, he indicated that the work ranges from basic to applied fields. The genetic through social and environmental levels and descriptive, measurement, experimental, and translational studies are performed in laboratory and field settings using quantitative, qualitative, and mixed-methodologies.

Therefore, in this section, we followed the viewpoint suggested by Biddle and Mutrie (2008) and Kim and colleagues (Kim et al. 2012a) to describe the Korean exercise psychology research. Both reviewed studies indicated that most of the issues and topics carried out in the area of exercise psychology covered (a) psychological correlates of physical activity, such as self-efficacy, attitudes, perceived benefits, and barriers, etc., (b) psychological theories in physical activity research, such as transtheoretical model, the theory of planned behavior, self-determination theory, and social-ecological model, etc., and (c) psychological outcomes of physical activity, such as changes in depression, cognitive functioning, and quality of life, etc.

In order to identify variation in exercise psychology research, we calculated the number of articles being published in KJSP based on titles and keywords. We observed both absolute and relative increases in the proportion of exercise psychology research [e.g., 19 ( $M = 1.9$ ) in 1990–1999, to 151 ( $M = 15.1$ ) in 2000–2009, 161 ( $M = 16.1$ ) in 2010–2019]. In specific, there has been a great deal of research on correlates of physical activity since 2000 (Kim, 2004; Lee & Song, 2011), as it has been frequently studied around the world. The majority of studies employed self-reported physical activity (72.0%), and this did not



**Fig. 1.** Number of articles published in the KJSP.

change over time. In terms of research designs, cross-sectional studies appeared the most frequently (85.1%), followed by intervention studies (8.7%) and measurement studies (6.2%). The remarkable nature of studies in the 2000s was that theory-based research firstly emerged and was explosively carried out (19.4%). For instance, the transtheoretical model (Kim, 2004; Lee & Yun, 2015), the theory of planned behavior (Lee, Park & Im, 2015; Park, 2011), self-determination theory (Do & Yoo, 2015; Kim, Kim, Cha & Kang, 2012), the social-ecological model (Kang, Kim & Park, 2016; Lee, Lee & Yun, 2017) were frequently applied in physical activity research from 2000–2019. When the body of work is considered its entirety, the majority of studies were carried out in a descriptive aspect (47.2%), and they have shown the largest increase over time. Among them, a total of 92 articles (38.0%) was focused on identifying psychological antecedents of physical activity participation (i.e., attitudes, beliefs, self-efficacy, intention, and motivation, etc.); other 55 articles (21.6%) investigated to explore the health-related consequences of physical activity such as weight control, stress management, Quality of life, emotion, and depression, etc. (Kim, Kim & Kang, 2013; Xu, Zhao & Hwang, 2018; Yook, 2012).

Along with the studies based on psychological theories and models, a large number of exercise psychology studies have been devoted to exploring significant variables associated with physical activity participation from a comprehensive viewpoint. In this regard, the social-ecological model has been paid much great attention as an effective tool to explain physical activity (Kang & Kim, 2011; Kim, Park & Lee, 2013; Lee et al., 2017). The significance of such research trends reflects that the physical environment which has not been frequently considered in exercise psychology research is recognized as an important factor associated with physical activity in Korea.

Moreover, several issues in the Korean exercise psychology research should be addressed. Even though it has a small proportion in the number of the published article ( $n = 23$ ), measurement issues have always been of keen interest to Korean researchers addressing psychological factors in physical activity. Measurement articles were scattered throughout the KJSP from 2000–2014 (13 articles from 2000–2010, 5 articles from 2011–2014, and 5 articles from 2015–2019). As a result, many psychometric questionnaires were developed in Korean and have been applied so far (i.e., exercise flow scale, exercise addiction scale, exercise motivation scale, exercise self-efficacy scale, decisional balance scale, basic psychological need scale, and social support scale, etc.). In addition, some studies ( $n = 15$ ) applied the randomized intervention modality in a longitudinal perspective to identify physical activity changes (Kim & Lee, 2009; Kim et al., 2013). These studies were conducted

for various age groups in different settings and used physical activity and psychological treatment to increase physical activity participation and its related psychological variables (i.e., confidence, perception, attitude, and motivation, etc.) and to identify health-related outcomes of physical activity (weight control, depression, cognitive function, mood state, physical fitness, quality of life, etc.). Lastly, as multidisciplinary research became more prevalent in sport science over the years, 30 articles which are focused on physical education classes or physical activity participation in school were published in the KJSP (Kang, Kim & Kwan, 2018; Ko & Jung, 2010; Lee, 2019; Park & Yoo, 2012). For instance, pedagogy and psychology researchers collaborated to investigate how motivational climate affects student's psychosocial outcomes (i.e., ego-resilience, achievement goal, and intrinsic motivation, etc.), or exercise physiology and psychology researchers worked together to study the effect of an after-school activity program on students' various health outcomes (i.e., health-related physical fitness and mental health, etc.).

### 2.3. Motor behavior

Motor behavior research had played a significant role when the KJSP was first launched in 1990. In the first published volume of the journal, 5 out of 7 articles could be considered as motor behavior related research. Such strong contributions were possible mainly because of the academic interests of Korean researchers who had been influenced by the rapid development of motor behavior research in kinesiology at that time. While there were only a few researchers who had a first-hand exposure to the academic development of this area (especially in the U.S.A.), the research interests on this area among the graduate students were strong enough to kick-start the establishment of motor behavior laboratories in Korea.

However, during the next several years, such initial dominance quickly faded out as the area of sport and exercise psychologies began their contributions to the KJSP (Fig. 4). This trend also coincides with the increase in volume from the biannual to the quarterly publication of the KJSP in 2002–2003. Widespread public interest in exercise and well-being as well as the thirst for the ways to improve sports performance recruited a large number of graduate students to sport and exercise psychology majors. On the other hand, motor behavior area lacked such expansion, and the number of motor behavior researchers remained relatively constant mainly due to the saturation of the academic positions in Korea.



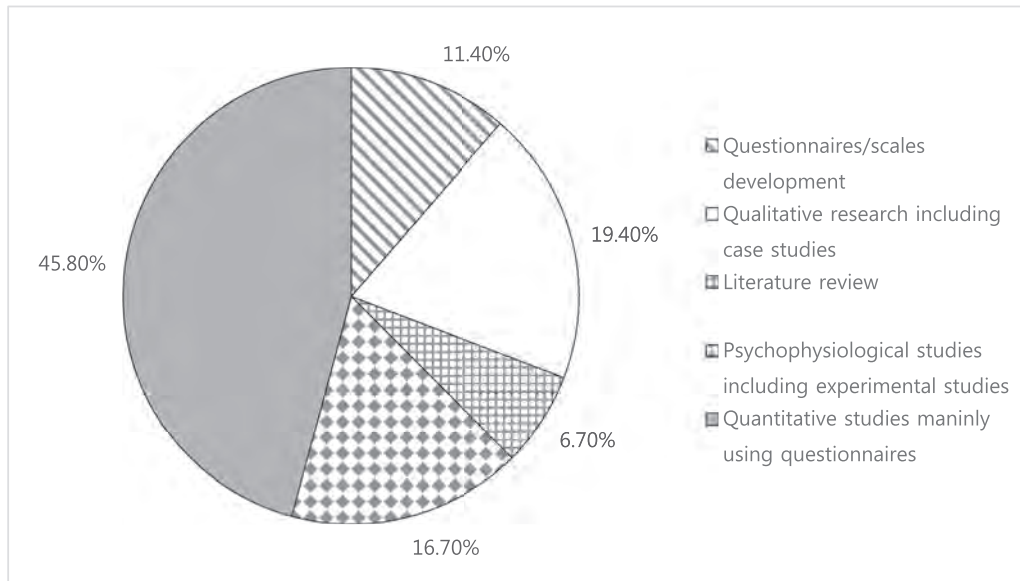


Fig. 2. Topical analysis of the sport psychology research published in the KJSP.

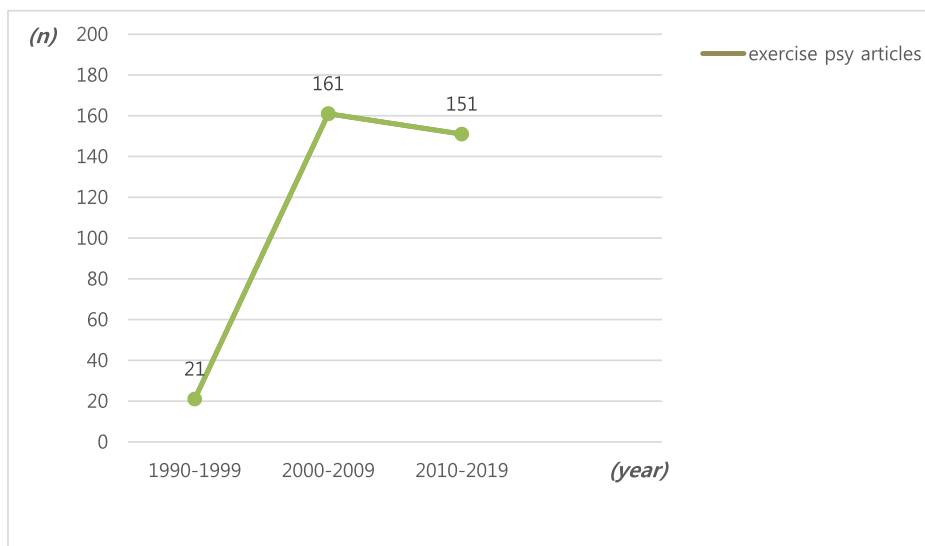


Fig. 3. Research trends of exercise psychology in the KJSP.

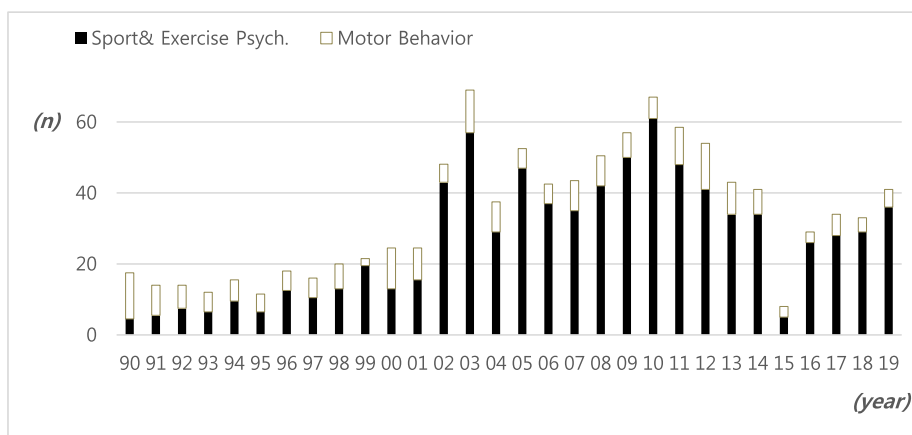
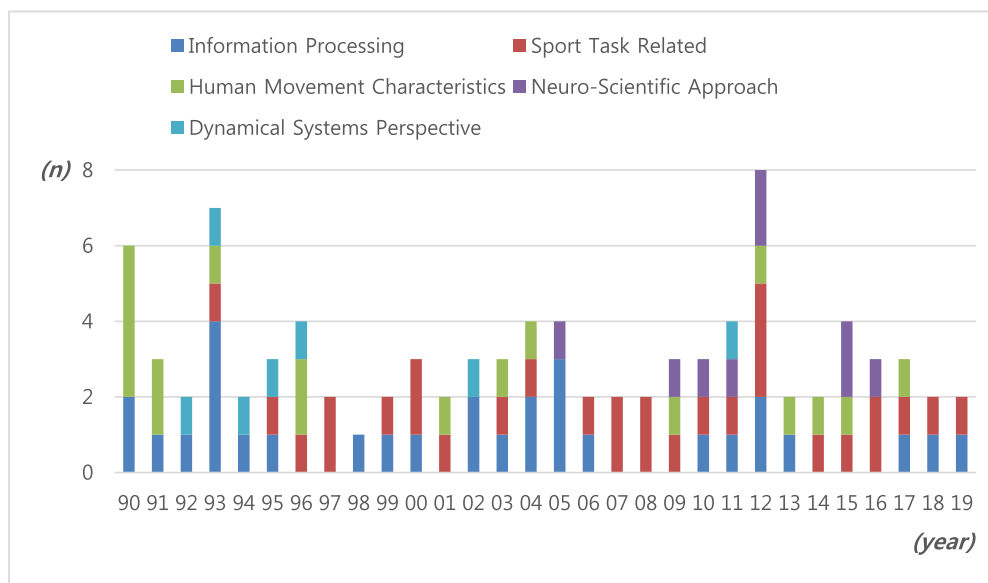


Fig. 4. Number of articles published per year in the KJSP.



**Fig. 5.** Topical analysis of the motor control research published in the KJSP.

A total of 213 motor behavior articles have been published in the KJSP over 30 years. It can be also categorized into 89 motor control, 68 motor learning, and 56 motor development related topics. With such a limited sample size over a long period of time, it is irrelevant to carry out any meaningful quantitative analysis. So, in the following sections, we have tried to analyze the topical trends and what these trends reflect from the Korean sport psychology field.

### 2.3.1. Motor control research

As mentioned above, a significant portion of the KJSP was contributed from the area of motor behavior during its initial years. The motor control related research topics during this infancy period covered spatio-temporal characteristics of arm movements, and contributions of sensory feedback and perception (Fig. 5). A strong heritage of reaction time analyses allowed investigating such topics to better understand the human information processing and movement characteristics. Chung (1990) was involved in these studies as one of the first motor control researchers in Korea (Lee & Chung, 1990; Oh & Chung, 1990), and tried to introduce the early to recent motor control studies (Carlton, Robertson, Carlton & Newell, 1985; Schmidt, Zelaznik, Hawkins, Frank & Quinn, 1979) to Korea. These early studies provided significant nutrition to cultivate the motor control area in Korea. Although such initial dominance has faded out over several years, research interests in these topics have never ceased and continued.

Few years later, a couple of new researchers (Kim, 1993; Ko, 1992) returning from the United States, introduced the dynamical systems perspective to Korea. However, research interests in this perspective short-lived as much of their research efforts were skewed to the learning and developmental aspects of motor behavior. This also reflects the strong academic tendency of Korean motor behavior research following the western mainstream motor control academia. On the other hand, in 1993, application of motor control principles to the real world sporting task (tennis stroke) was first attempted by Chung and Jun (1993). Unlike the theory and lab task oriented research issues, this practical approach did not experience the loss of its appeal and continuously contributed to the development of the KJSP. Such a continuous interest for the sport task and performance was partly made possible by the introduction of new research tools such as the eye movement tracking technique (Kwon & Kim, 2004).

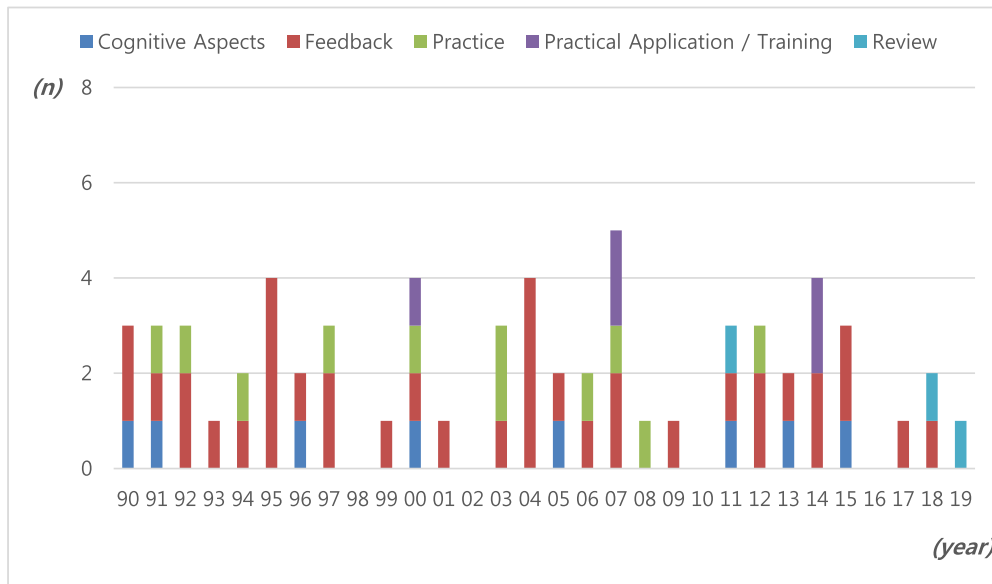
The most significant influence of the newly developed of research techniques could be spotted from the studies investigating the neural control of movements. Rapid development of neuroscience also began to shed light on the neural mechanism of motor control as the 21st century began. Since the event related potentials during movement were first

introduced (Kim, Jung & Woo, 2001), the electroencephalography technique became the most popular tool for investigating the neural mechanism of movement (and, further, various cognitive aspects of sport psychology) in Korea. Recently, introduction of the transcranial magnetic stimulation (Hong & Woo, 2013; Yoon & Lee, 2010) and the functional magnetic resonance imaging (Huh & Lee, 2015; Kim, Kim & Ryu, 2010) techniques further expanded the scope of neuro-motor control research in Korea.

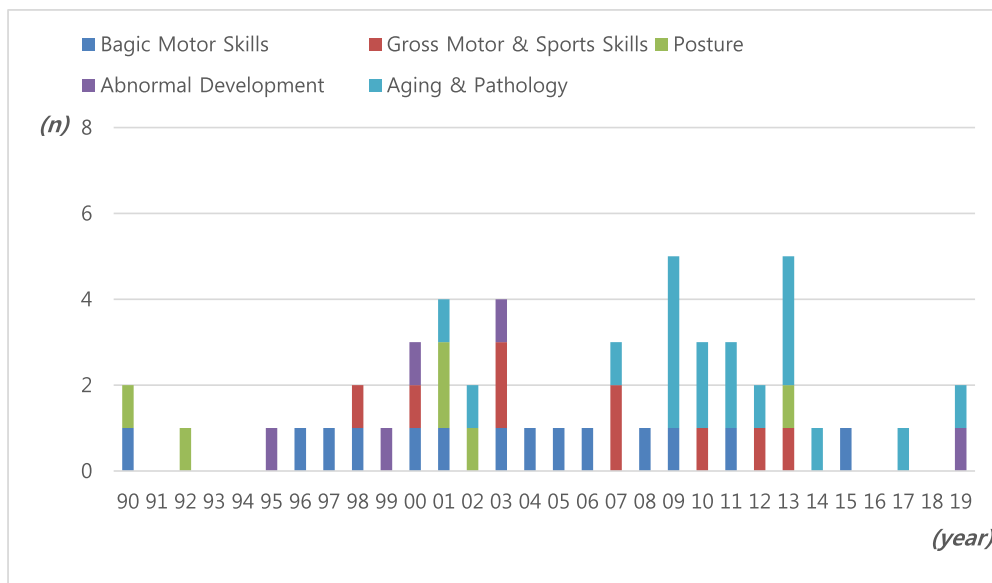
One of the interesting characteristics of the motor control articles published in the KJSP is the relatively small number of studies investigating the gait and posture related issues (categorized as the movement analyses in Fig. 5.). Because most gait and posture studies were interested in the aging and developmental aspects, they are labeled as motor development studies in this review. However, the relative contribution from these topics was still sparse when compared to the international publication trends. This has been mainly due to the academic segregation among Korean kinesiology field. Research tools such as kinematic, kinetics, and electromyography has been often considered as the sole property of the biomechanics area, and the academic works of the biomechanics were rarely submitted to the KJSP despite the shared research interests. This caused problems of experimental accessibility and technical expertise for the motor control researchers while the biomechanists experienced the lack of divergent research topics. Such continuing trend has significantly limited the scope and development of the research in both fields. Mutual perception regarding this problem and converging academic efforts are demanded.

### 2.3.2. Motor learning research

Unlike other motor behavior related disciplines, the area of motor learning in Korea has several distinctive characteristics. Therefore, in this part of the review, we will try to introduce such characteristics and to identify possible reasons. Although the research motivations for scientists in the motor behavior area were to further explore the underlying nature of the movements, the practitioners from the coaching, education, and sport scenes demanded more applicable knowledge from the researchers, and the area of motor learning was the one that could satisfy such demands. Incidentally, the year 1990 was the period when the applicability of motor learning research was on a debate in an international scale. The journal, *Quest* has even published a special issue titled 'Usefulness of motor learning research for physical educators' to address this specific point, and many leading scientists provided their insights in this special issue. This reflects the fact that, by 1990, the applicability of the motor learning research was the subject of three decades of inconclusive discussion (Locke, 1990). However, such history of theory versus



**Fig. 6.** Topical analysis of the motor learning research published in the KJSP.



**Fig. 7.** Topical analysis of the motor development research published in the KJSP.

application debate did not discourage Korean scientists from initiating their applicable experiments.

During its initial years of the KJSP, various aspects of motor learning such as bilateral transfer (Kim, 1990a) or type of augmented feedback (Kim, 1990b) were introduced. These works were oriented more toward the introduction of the concept to Korean scientists and graduate students who were not familiar with the concepts. But, soon, full scale and theory testing experiments followed (e.g., Kim & Kim, 1991) to firmly plant the research tradition of motor learning in Korea. Among various research topics in motor learning, majority of the KJSP publication was dominated by the knowledge of results (KR) and practice schedule related articles (Fig. 6). Especially, more than 50% of motor learning articles investigated KR related issues. Considering their theoretical significances in the area, it is an understandable symptom. However, some of those studies showed lack of originality. In fact, many earlier KR studies lacked solid theoretical ground and concentrated on the hypothesis lacking details of the KR delivery.

Another interesting aspect of Korean motor learning research is its enthusiasm toward the performance enhancement. Korean national sport performances improved dramatically since the 1988 Seoul Olympic Games, and the needs for the performance improvement were

significant during the 90 s. Thus, studies investigating the various training aids such as video analyses, bio-feedback, modeling, and sensory cueing were welcomed and practitioners were eager to try those. This would be one of the reasons why the feedback research was so popular during that period. The development of training tools and techniques showed only a half of this sport enthusiasm in Korean motor learning. During its initial years (1990–1995) of the KJSP, most motor learning studies (10 out of 16) employed the traditional laboratory experimental paradigm and tools. But, currently, this ratio was reversed, and the number of motor learning studies using the actual sport tasks is far greater (9 out of 13) as Fig. 6 displays.

As the year progressed, the research themes gradually progressed from the traditional motor learning topics. Recent studies started dealing with cognitive aspects of learning such as the brain plasticity (Jang & Lee, 2019; Lee, Lee & Ha, 2005) or motor memory consolidation (Ko, Ko & Seo, 2013), and recent developments of information technology were reflected as well (An & Lee, 2018; Ko, Seo & Kwak, 2013). Especially, studies applying the motor learning principles to special populations (Im, Lee, Song & Park, 2013; Lee & Song, 2017) are expected to expand the horizon of practical application in Korean motor learning research.

### 2.3.3. Motor development research

Motor development in Korea has not been as strong as other motor behavior areas. It is not surprising, in a sense, because of the traditionally undervalued concepts of the exercise and movement in premodern Korean community. While the intellectual developments were highly appreciated among Korean parents, the exercise (and even health) was considered as something that could be sacrificed for better academic achievement. With such attitude, it isn't surprising to see the lack of motor development publication until the late 90 s (Fig. 7). As Fig. 4 indicates, researchers were aware of this academic discipline from the beginning of the KJSP publication, and the studies were competitive and up to date. For example, Kim and Yoon's (1990) study, the very first motor development article of the KJSP, was based on the earlier work by Woollacott, Debu and Mowatt (1987), and the inferences of the study were comparable to the suggestions from the leading researchers of the field (Woollacott & Shumway-Cook, 1990). In other words, while the knowledge base of motor development existed, the research motivation was missing. In a sense, this tendency still exists up until now.

During the late 90 s, a group of researchers introduced the dynamical systems perspective to Korea. So the related topics such as bimanual coordination (Huh, 1998) or synergy (Kim & Park, 2001) were applied to the developmental characteristics and resuscitated the motor development research in Korea. As the 21st century began, the academic discipline of motor development in Korea started to spread its interests toward aging adults and neurological patients. Especially, studies on the stroke/Parkinson's disease/cerebellar ataxia patients and their healthy counterparts became the main driving force of the Korean motor development research. Because the knowledge base of the aging process and various experimental techniques gave the motor development researchers edge over researchers from other disciplines, this type of topic could be quickly settled in the motor development area.

Overall, the history of Korean motor development is not conventional. There is a significant lack of traditional developmental research. And, unlike motor control or learning, there is almost no study interested in the interaction between motor development and sports skills. As mentioned above, this would be mainly due to the lack of appreciation toward the exercise and movement of children in Korea. Of course, this conception is changing rapidly, but the dropped back scientific experience and knowledge base may hinder the development of this research aspect in Korea. On the other hand, the aging and pathological studies are getting much attention and support at the moment as the Korean general population is increasingly getting old. To further expand the scope of this research field, converging research efforts from all three motor behavior areas are critical. The fundamental theory of movement, its understanding of the related neural system, and the principal and technique of learning and plasticity should be able to provide meaningful suggestions when they are properly converged.

### 3. Conclusion

The Korean Society of Sport Psychology has been actively moving forward to facilitate and to develop sport and exercise psychology in Korea while creating partnerships and a free exchange of knowledge among scholars from the professional community in not only Asia but all over the world.

The current paper generally described historical research trends and emerging themes in Korean sport and exercise psychology based on the articles published in KJSP. From 1990 to 2019 in reviewing 30 years of trends in topics, research design, and methodologies, we identified valuable insights about sport psychology, exercise psychology, and motor behavior. First, sport psychology research is dominantly carried out than exercise psychology and motor behavior in KJSP and has been aimed at enhancing sport performance and its related psychological variables. In summary, quantitative survey studies with questionnaire development have been most frequently conducted and dealt with various themes such as personality, self-efficacy, group cohesion, emotion, motivation,

attribution, anxiety, etc. Moreover, in an experimental context, psychophysiological studies have been examined the interrelationships of between sport psychological variables (i.e., mental imagery, bio-feedback, personality, competition anxiety, and emotion etc.) and physiological variables (i.e., EEG, ERP, P300, HR, and blood pressure etc.). Second, exercise psychology which is focused on promoting health and quality of life through individuals' physical activity participation and adherence has been gradually paid great attention. In specific, many studies in this area have been carried out not only to identify various health-related physical and psychological benefits of regular physical activities but attempted to change physical inactivity behavior by using the cross sectional survey or longitudinal intervention research design. Moreover, theory-based study has been frequently published and significantly contributed to understand psychological variables associated with physical activity. Third, the research areas such as motor control, learning, and development had established strong academic traditions from the initial eras of Korean sport psychology. However, multidisciplinary characteristics of these areas often kept sport psychologists at a distance. Such tradition of concentrating and staying in one's own academic territory in Korea has become loosened, however, and the convergence with neuroscience and rehabilitation is re-igniting the research and public interests on the motor behavior research in Korea.

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