



Review

Trends and changes in research on the psychology of physical activity across 20 years: A quantitative analysis of 10 journals

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ARTICLE INFO

Available online 12 June 2011

Keywords:

Review
Exercise
Theory of planned behavior
Social cognitive theory
Self-determination theory
Transtheoretical model
Socio-ecological model
Methodology

ABSTRACT

Objective: To investigate content of the psychology of physical activity research over the past 20 years.

Method: Volumes of 10 journals, identified by impact factor and relevance to physical activity were audited every other year, during the period of 1990–2008. Inclusion criteria were studies that measured a physical activity outcome, and/or a psychological outcome as a result of physical activity. Data were extracted and coded based on 15 factors.

Results: The review yielded 889 studies for analysis. Total volume of studies (from 127 in the 1990s to 762 in the 2000s), and the proportionate content space allotted to journals has increased significantly across 20 years (effect size $w=0.24$) (Cohen, 1992). Many study characteristics (assessment of minority/high-risk groups, self-report measurement, cross-sectional designs) have not changed. There was evidence, however, of less growth in research among older adults and young children (effect size $w=0.15$) compared to other age groups (effect size $w=0.24$), a move from pure measurement studies (effect size $w=0.21$) to descriptive research (effect size $w=0.27$), and considerable growth in environmental correlates research across time (effect size $w=0.41$) in the 10 journals sampled.

Conclusion: The behavioral science of physical activity has clearly increased in prominence and volume among the 10 journals sampled, but methodological characteristics of research could be improved in the future.

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Physical activity has been linked to improvements in over 25 chronic conditions and has a preventive effect on most major chronic

diseases (Warburton et al., 2007; Warburton et al., 2006). Indeed, regular physical activity is likely the single best prescription that people of all ages could take for a collection of health benefits (Church and Blair, 2009). Despite this accrual of evidence, regular physical activity participation is very low in most industrialized nations

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with at least half of the populace failing to meet minimal guideline recommendations required for health benefits (Canadian Fitness and Lifestyle Research Institute, 2004; U.S. Department of Health and Human Services, 2003). Thus, the study of behavioral participation in physical activity is of grave importance.

The study of physical activity participation is relatively young, particularly when one considers the much longer history of exercise physiology (e.g., Astrand and Ryhming, 1954; Hill and Lupton, 1923; Krebs, 1935; founding of ACSM in 1954). It was not until Dishman's (1988; 1994) now seminal edited books on the topic, that the discipline began to gain attention. The evidence for the increase in behavioral research in physical activity is apparent with the introduction of dedicated journals, a much larger complement of researchers, course offerings at almost all major institutions of higher learning, and considerable research funding dedicated to the topic.

As the discipline moves into its third decade of intense attention, it seems fitting to step back and ascertain where the research has taken our body of knowledge. As Nigg and Jordan (2005) point out, the psychology of physical activity is a fledgling discipline that has its roots appropriately in the fields of other more established disciplines such as sport psychology, social psychology, epidemiology, and sociology. A descriptive assessment of behavioral research over time is helpful to identify whether our methods have improved and whether the content of our research has changed. Therefore, the purpose of this paper was to review a collection of 10 “flagship” journals to appraise, theme, and investigate content in these journals over the past 20 years, similar to the analyses conducted in other disciplines (e.g., Robins et al., 1999; Sanson-Fisher et al., 2008; Sanson-Fisher et al., 2006; Shakeshaft et al., 1997).

While the basis of this approach is exploratory, we generated some hypotheses. These were based on the template created by Sallis, Owen and Fotheringham (2000) for classifying the maturity of behavioral research, as well as on our readings and experience in the discipline. First, it was hypothesized that the volume and proportion of behavioral research would increase over time. Second, we hypothesized that, compared to studies published in the 1990s, those published in the 2000s would employ more direct methods of physical activity measurement and samples would comprise higher-risk specialty populations (e.g., cancer survivors, older adults). Third, in line with Sallis et al. (2000), we hypothesized that more intervention work and experimental designs (total volume and proportionality) would have been conducted since 2000 compared to the 1990s; and that measurement validation and correlational designs (linkage evidence) would have been more prevalent (proportionately) during the 1990s. Fourth, in terms of theoretical advances or trends, we hypothesized that environmental approaches to understanding physical activity would have been more prevalent in recent research.

Methods

Sampling

Volumes of ten English language flagship journals (American Journal of Preventive Medicine (Impact Factor from 2009 (IF)=4.235), Annals of Behavioral Medicine (IF=3.145), Health Psychology (IF=3.462), International Journal of Behavioural Nutrition and Physical Activity (IF=2.627), Journal of Physical Activity and Health (IF n/a), Journal of Sport and Exercise Psychology (IF=2.951), Medicine and Science in Sport and Exercise (IF=3.707), Preventive Medicine (IF=3.172), Psychology of Sport and Exercise (IF=2.152), and Research Quarterly in Exercise and Sport (IF=1.103) were audited every other year, during the period of 1990–2008. Journals were identified by impact factor, relevance to the behavioral science of physical activity, and consensus between authors. These journals represent a sample of physical activity specific and general health outlets but all are generalist in terms of populations (e.g., older adults) and health conditions (e.g., cancer) so they represent a likely outlet for most behavioral physical activity research. The choice of journals was not intended to be

comprehensive, and the results are considered limited to the journals chosen. All original research article titles and abstracts within these volumes were initially audited ($n=6108$), and when necessary, full-texts were read.

Inclusion and exclusion criteria

Reviews, meta-analyses, commentaries, letters, editorials, conference abstracts, book reviews, notes, and corrections were not evaluated nor included in the total number of audited publications. Studies on physical activity behavior and psychological outcomes as a result of physical activity were evaluated ($n=889$). From these, data were extracted and coded based on journal; country; participant number, gender, age, and ethnicity; physical activity measure used; type of research design; whether or not the study was experimental, and if it was, duration, dose, number of arms, method of dissemination, and intervention content; and model or theory employed. When classification or coding appeared ambiguous, a decision was arrived at by discussion and consensus between the authors.

Coding

Region was coded based on the country where the data were collected, and when this was not specified, coding was based on the country of employment of the primary investigator. Countries were then grouped by continent. If data were collected in more than one country, the article was coded as “multi.” Participant gender was grouped as male only, female only; and mixed gender. Population age was divided into preschool (5 years and younger), child (6 to 12 years), teen (13 to 17 years), young adult (18 to 44 years), middle-aged adult (45 to 64 years), and older adult (65 years and older). If a study's participant age range overlapped coding categories, mean age was used. When mean age was not specified, median age was used. Ethnicity was divided into Mixed ($\leq 75\%$ Caucasian), White/Caucasian ($>75\%$ of the population), Black/African American/African ($>75\%$), Asian ($>75\%$), Hispanic/Mexican American/Latino ($>75\%$), Native American/Aboriginal, and other. When ethnicity was not specified, ethnicity was not coded.

Physical activity measure was coded as direct (accelerometer, pedometer, heart rate monitoring), direct observation (using validated or non-validated measures), validated self-report, or study-created self-report. If more than one measure was used, the study was coded based on the “highest quality” of measures utilized. If the validity of measures derived from a questionnaire was not reported, it was coded as study-created. Research design was coded as cross-sectional (one-time measurement or longitudinal <1 month), longitudinal (follow $>$ month), pre-experimental (no control group), quasi-experimental (includes control group, no randomization), randomized controlled trial, qualitative, or measurement (creation, validation, or reliability of a measure). If the study was experimental, duration (weeks), number of arms, method of dissemination (face to face, phone, email or print without contact, or mass-media), and intervention content (persuasion; self-regulation; or experiential) were coded.

Data analysis

Data analysis occurred in 2009 and included chi-square tests of proportions (of original research in behavioral medicine compared to all original research) across year (and decade) using cross tabs. Significant results ($p<0.05$) were followed up by univariate chi-square analyses. Total volume estimates of original research were compared using univariate analyses of variance with Tukey post-hoc tests. Our specific analyses included basic descriptive breakdowns of behavioral research by journal, region, gender, age, ethnicity, research design, physical activity measure, theoretical frame, and intervention characteristics. This was followed by an analysis of the volume of studies across time (both absolute and relative to other original research within issues) and characteristics of participants, study design, behavior measurement, theory applied, and intervention characteristics. All analyses were conducted using SPSS 19 (IBM, 2010).

Results

Study characteristics

Study characteristics for the 889 papers extracted over the last 20 years are presented in Table 1. Studies were primarily North

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