A META-ANALYTIC REVIEW OF ACHIEVEMENT GOAL ORIENTATION CORRELATES IN COMPETITIVE SPORT: A FOLLOW-UP TO LOCHBAUM ET AL. (2016)

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Review
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Abstract:

Recent quantitative research in competitive sport using the Task and Ego Orientations in Sport Questionnaire (TEOSQ) and Perceptions of Success Questionnaire (POSQ) pointed to a potential critical issue that the two questionnaires did not agree across a number of tested hypotheses (Lochbaum, et al., 2016). Thus, the present quantitative review examined whether correlates of the two achievement goal orientations were moderated by the two measures. To achieve this purpose, 772 unique correlates (489 TEOSQ, 283 POSQ; 402 task orientation, 370 ego orientation) from 93 studies spanning 1989-2016 from 32 countries with 26,387 participants were placed into 15 different categories and meta-analyzed. The task goal orientation was significantly and small to moderate in meaningfulness related to adaptive success factors (r_w=.29), maladaptive success factors (r_w=-.12), desirable behaviors (r_w=.28), positive emotions (r_w=.35), amotivation (r_w=-.13), extrinsic motivation (r_w=.20), external regulations (r_w=.12), internal regulations (r_w=.34), intrinsic motivation (r_w=.47), the mastery/task climate (r_w=.38), perceived competence (r_w=.26), and trait self-esteem (r_w=.35). The ego goal orientation was significantly and small in meaningfulness related to adaptive success factors (r_w=.10), maladaptive success factors (r_w=.12), negative emotions (r_w=.11), undesirable behaviors (r_w=.23), amotivation (r_w=.16), extrinsic motivation (r_w=.28), external regulation (r_w=.21), intrinsic motivation (r_w=.14), performance/ego climate (r_w=.28), and perceived competence (r_w=.17). The questionnaire measure was a significant moderator for the task goal orientation relationship with desirable behaviors (POSQ r_w=.24; TEOSQ r_w=.37), internal regulations (POSQ r_w=.26; TEOSQ r_w=.39), and trait self-esteem (POSQ r_w=.45; TEOSQ r_w=.32) and for the ego goal orientation relationship with performance/ego climate (POSQ r_w=.34; TEOSQ r_w=.24). Overall, the extent of the questionnaire type being a concern when examining correlates was fortunately minimal. Yet, differences in the two dominant measures exit. Recommendations for future research examining both the TEOSQ and POSQ were proposed.

Key words: *achievement goal theory, motivation, achievement goals, quantitative review*

Introduction

Achievement goal theory (AGT) has been a dominant framework for researching achievement motivation in the competitive sport literature since the late 1980s (Lochbaum, Kazak Çetinkalp, Graham, Wright, & Zazo, 2016). This dominant social-cognitive model framework was adopted in sport psychology from a number of research efforts in education (Ames, 1987; Dweck & Elliot, 1983; Maeher, 1984; Nicholls, 1980, 1984, 1989). The proliferation of AGT in sport psychology clearly was due to the development of valid and reliable measurements of the two achievement goal orientations in sport, the TEOSQ (Duda, 1989; Duda & Nicholls, 1992) and the POSQ (Roberts & Balagué, 1989, 1991; Treasure & Roberts, 1994; Roberts, Treasure, & Balagué, 1998). Whether the reason was simply "first out of the gate", the TEOSQ has

been the more used measure worldwide compared to the POSQ (Lochbaum, et al., 2016). Until recently (Lochbaum, et al., 2016), research had not specifically summarized AGT in competitive sport. This review seemed long overdue given the global popularity of competitive sport and of AGT as a research framework as evidenced in past dichotomous reviews including sport and physical activity studies (Biddle, Wang, Kavussanu, & Spray, 2003; Ntoumanis & Biddle, 1999) and more recent reviews of other achievement goal frameworks (Lochbaum & Gottardy, 2015; Lochbaum, Jean-Noel, Pinar, & Gilson, 2015).

Lochbaum and his colleagues (2016) sought to further AGT in competitive sport by quantifying the TEOSQ and POSQ literature, by testing the interdependence of the two goal orientations, and by testing a number of historic AGT task and ego goal orientation hypotheses. Concerning the body of literature, the authors reported on 260 studies from 1989 to 2016 that met their study inclusion criteria. The total sample size was 80,959 from 39 different countries. The count of published research that met inclusion criteria across decades strongly suggested that the research framework's popularity is strong and perhaps still growing. Not surprisingly, the samples endorsed the task goal orientation more than the ego goal orientation. Somewhat of a surprise, the meta-analyzed mean data showed that the POSQ task and ego overall mean values were larger in magnitude and meaningfulness than the TEOSQ task and ego overall mean values. Concerning, the independence of the two goal orientations the results pointed to minimal shared variance (3.24%), thus supporting the hypothesized independence of the two goal orientations.

Concerning hypotheses that have been around in the AGT literature for decades, Lochbaum and colleagues (2016) specifically tested whether females endorse the task goal orientation more and ego orientation less than males, whether elite athletes endorse the task goal orientation more and ego goal orientation less than sub-elite athletes, whether individual sport athletes endorse the ego goal orientation more so than team sport athletes; and whether more collectivistic countries (e.g. Asian countries) endorse the ego goal orientation more and task orientation less than more individualistic cultures. Marginal to strong evidence in support of many of the tested hypotheses was found. Stronger support for the tested hypotheses was found with the ego goal orientation. For instance, males endorsed the ego goal orientation more than females as did individual sport athletes compared with team sport athletes. Unfortunately, support was not consistent for the tested hypotheses across both the TEOSQ and POSQ. In fact for the two strongly supported hypotheses just mentioned, the male/female difference was strongly supported by the POSQ measured ego goal orientation whereas sport type was strongly supported by the TEOSQ measured ego goal orientation. Only for the hypothesis that individualistic countries are greater in the task orientation than collectivistic countries was the support for the TEOSQ and POSQ consistent.

Due to the differences in TEOSQ and POSQ in overall mean values and differences in support for a number of tested historic hypotheses, the question arose as to whether these differences extended to correlates of achievement goals. Divergent differences would certainly be of great concern to the dichotomous AGT literature. Based on the results of a motivation climate meta-analysis (Harwood, Keegan, Smith, & Raine, 2015), it was apparent that there would be a suitable number of motivation climate and goal orientation samples to examine whether the questionnaire measure moderated the goal orientation to climate relationships. As reported by Lochbaum and his colleagues (2016), there was evidence of moderation. Specifically, evidence was found for the ego goal orientation and the performance/ego climate. The POSQ meta-analyzed correlation with motivation climate as measured by the original climate measure (Perceptions of Motivation Climate in Sport Questionnaire – PMCSQ: Seifriz, Duda, & Chi, 1992) was larger (r_w=.37) compared to the TEOSQ (r_w=.27). Moreover, this difference was greater for the revised PMCSQ (PMCSQ-2: Newton, Duda, & Yin, 2000) between the POSQ ego goal orientation (r_w=.32) and the TEOSQ ego goal orientation (r_w=.17) with the performance/ego climate. The finding seemed of more concern given the interpretation of meaningfulness crossed two categories with the TEOSQ correlation interpretation as small, while the POSQ correlation interpretation was medium in meaningfulness.

Study purpose and hypotheses

Given the findings of Lochbaum et al. (2016) and the importance of AGT as an active area of research in competitive sport, the main purpose of this quantitative review was to determine whether the TEOSQ and POSQ differed in relation to achievement goal correlates. To achieve this purpose, the overall relationships of achievement goal correlates were examined; thus, furthering the knowledge of the dichotomous achievement goal literature in competitive sport. The hypotheses were straightforward based on anticipated groupings of the correlates based on past reviews (Biddle, et al., 2003; Ntoumanis & Biddle, 1999). The task goal orientation was hypothesized to be positively and small to moderate in meaningfulness correlated with adaptive achievement strategies (e.g. endorsement of effort), behaviors (e.g. sportspersonlike), motivations (e.g. intrinsic motivation), positive emotions, perceived competency, the mastery/task climate,

and personality traits such as global self-esteem. Though the ego goal orientation has been historically hypothesized to be positively related to maladaptive or less desirable achievement behaviors, strategies, and emotions, past quantitative reviews have not reported meaningful relationships. Even so, the logical overall hypothesis forwarded for this quantitative review was that the ego goal orientation positively albeit small in meaningfulness correlated to traditionally considered maladaptive achievement strategies (e.g. endorsing doping), behaviors (e.g. aggression), extrinsic motivations, and negative emotions, and the performance/ego climate.

Methods

Search strategy

The literature search was systematic and comprehensive. The search was based on the PRISMA flowchart (Moher, 2009) found in Lochbaum et al. (2016). Additional articles were screened up until July 1, 2016. The additional screening included searching electronic databases. The electronic database search was conducted in EBSCO with individual databases specific to sport (SPORTDiscus), psychology (PsycINFO), and education (ERIC). Key word combinations were identical to those of Lochbaum and colleagues (2016). Given the different purpose of the present quantitative review, the PRISMA flowchart data were updated (see Figure 1).

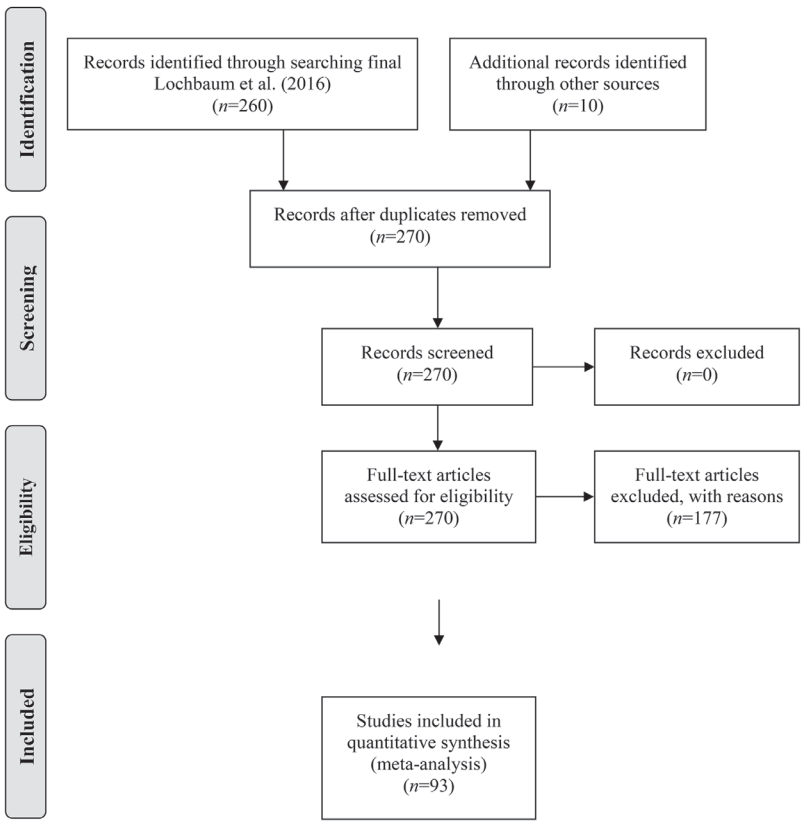

Figure 1. PRISMA flow diagram of search strategy.

Inclusion and exclusion criteria

The articles retained met the following inclusion criteria: (a) papers must be published in a language that the authors were fluent in and, if not fluent, could obtain assistance from a native speaker and/or translate via Google Translate (https://translate.google.com/); (b) papers must be published up to July 1, 2016; (c) papers must be original data published in peer-reviewed journals, and not theses, book chapters, or conference proceedings; (d) the participants and setting must have been in competitive sport; (e) papers must contain either the TEOSQ or POSQ; and (f) papers must report a correlation and sample size with at least one of the goal orientations another variable.

Articles excluded met the following criteria: (a) participants were in university run recreational sport programs; (b) participants were in university-based physical activity classes; (c) participants were in secondary school physical education class; (d) participants in categories a-c were mixed within participants that fell within the inclusion criteria and thus the competitive sport participant data could not be separated; or (e) sufficient statistical information was not provided.

Data extraction procedures

Data extraction (i.e. the correlations) procedures were handled mainly by the first and second author. Both authors independently examined all 262 articles for sufficient correlational data. The two authors compared lists of studies and settled on the included articles/samples. All of the correlations whether found in tables or in the text were photocopied in duplicate for independent inspection by the two authors. The first and second author used a color coding procedure and a detailed leger to determine potential correlate categories. This process of listing out the correlates and discussions concerning groupings lasted a number of weeks. The final list of 15 correlate categories was then determined to be as follows: (1) adaptive success factors (e.g. effort, adaptive perfectionism, approach coping, competitiveness), (2) maladaptive success factors (e.g. avoidance coping, maladaptive coping, doubt, fear of failure), (3) positive emotions (e.g. enjoyment, pleasant psychobiological states), (4) negative emotions (e.g. cognitive and somatic anxiety, unpleasant psychobiological states), (5) desirable behaviors (e.g.

prosocial behavior, sportspersonship), (6) undesirable behaviors (e.g. doping, aggression), (7) amotivation, (8) extrinsic motivation, (9) external regulations, (10) internal regulations, (11) intrinsic motivation, (12) mastery/task climate, (13) performance/ego climate, (14) perceived competence, and (15) trait self-esteem/concept. A complete listing of all of the variables within each category is available from the first author. There were a handful of correlates that were few in number and thus not presented. That list is also available from the first author. The second author extracted the correlations and sample sizes over the course of one month. After this was completed, the first author reexamined each study and all extracted correlates/sample sizes. The process was thorough. Determination of the final set of correlation categories, data extraction, and data checking were by far the most arduous and time consuming part of the research/manuscript writing process.

Data analysis procedures

Given the purpose of this review was to quantify achievement goal correlates and then to test whether the achievement goal measure moderated the relationships, coding of the data for analysis was straightforward. Each sample was coded as either TEOSQ or POSQ. Additional information about each study (i.e. country of sample, sex make up of sample, level of competition, and sport type) is also provided for context. Explanation of this coding is found in Lochbaum et al. (2016).

The Comprehensive Meta-Analysis (CMA) version-2 software, version 2.2.064 (Biostat, Inc., July 27, 2011) was used for all of the quantitative analyses. To examine the correlates of the two goal orientations as measured by the TEOSQ and POSQ, the mean weight correlation (r_w) was chosen as the measure of effect size as all extracted data were correlations (Hedges & Olkin, 1985). Cohen's (1990) criteria were used for the interpretation of r_w as follows: .10 to .29 as small, .30 to .49 as medium, and >.50 as large. Given two primary models are used to determine statistical assumptions of error, one must be logically chosen. The fixed effects model assumes that all of the gathered studies share a common effect and differences are a result of within study error or sampling error. The random effects model assumes both within study error and between-study variation. Given the extensive variety of studies, cultures, sports, level of competition, and adapted versions of the original TEOSQ and POSQ measures, the random effects model was chosen as both within study error and between-study variations most likely existed. To test whether significant differences existed between two effect sizes (i.e. ego vs. task, POSQ vs. TEOSQ), a mixed-effects analysis was used as the most appropriate fit to the data.

Even though the moderator, questionnaire measure, was chosen *a priori*, heterogeneity was analyzed to provide assurance of the need for the questionnaire moderator analyses. A number of statistics exist that measure heterogeneity. For the present investigation, the I^2 statistic was used. The I^2 statistic is the ratio of excess dispersion to total dispersion. As explained by Higgins and colleagues (Higgins & Thompson, 2002; Higgins, Thompson, Deeks, & Altman, 2003), I^2 may be interpreted as the overlap of confidence intervals explaining the total variance attributed to the covariates. Higgins and Thompson (2002) have provided a tentative classification of I^2 values to help interpret magnitude of the heterogeneity of variance: 25 (low), 50 (medium), and 75 (high).

Publication bias, the reporting and publication of hypothesis supportive results, is always a concern in a quantitative review. CMA provides a number of analyses to examine publication bias. For this review, examining the funnel plot (Egger, Davey Smith, Schneider, & Minder, 1997), the fail-safe N calculation (Rosenthal, 1979), and the 'trim and fill' procedure (Duval & Tweedie, 2000) were used. The fail-safe N statistic is interpreted as the number of samples required to change a significant effect size into a non-significant effect size. The greater the value, the more confidence one has that the meta-analyzed result is indeed safe from publication bias. The two-tailed test was used as it is more conservative. Thus, with large fail-safe N values, the confidence in the effect size being free of publication bias is higher. Funnel plots were examined to determine if the entered studies were dispersed equally on either side of the overall effect. Symmetry theoretically represents that the entered studies captured the essence of all relevant studies. To fix asymmetry, Duval and Tweedie's (2000) trim and fill analysis was used. Both the number of samples needed and the resultant meta-analyzed effect size, in this case a correlation, is provided in the CMA output. The first author examined each funnel plot and conducted the correction analysis for each reported meta-analyzed correlation. There was not any need to eliminate any data points as an outlier. Data points were either filled to the left (i.e. lowering the effect size value) or right (i.e. increasing the effect size value) of the mean depending upon the where the symmetry was lacking.

Results

Sample summary

Table 1 provides specifics regarding author, year, country, sample size, sex makeup of sample, level of sport competition, the sport category, whether the TEOSQ or POSQ was used, and the correlate categories represented from each study. A total of 93 studies from 1989 until the search process

stopped (July 1, 2016) were included in this review out of which 61 used the TEOSQ and 32 the POSQ. Eleven studies were retained from 1989-1999, 41 studies from 2000-2009, and 41 studies from 2010 until the search stopped. The total sample size was 26,387. The studies came from 32 different countries; USA (22.58%), UK (15.05%), Spain (8.60%), and Norway (6.45%) making up just over half of the represented countries. Team sports were the sport type of 45.16% of the studies with a mix of team and individual sports (30.10%), and individual sports (24.73%) making up the rest of the samples. Nearly the majority of the samples came from youth sport (48.38%) with the majority of studies with a mixed gender sample (65.59%).

Table 1. Study characteristics and correlate categories extracted from each study

Author	Year	Country	N	Sample Sex	Level	Sample Sport Type	Measure	Correlate Categories
Abrahamsen et al.	2008	Norway	101	M	Elite	I	*P*	PC, PE
Allen et al.	2015	Scotland	177	MG	Elite	Mix	*T*	M/TC, P/EC, UdB
Asghar et al.	2013	Germany	248	M	Youth	T	*T*	SE, PC, PE, M/TC
Atkins et al.	2015	USA	205	M	Youth	Mix	*T*	PC, PE, M/TC, P/EC
Balaguer et al.	2002	Spain	181	F	Elite	T	*T*	DB
Baric et al.	2002	Croatia	246	MG	Youth	I	*T*	PC, ASF, IM, EM
Boardley & Kavussanu	2010	UK	307	M	Mixed	T	*P*	NE
Bortoli et al.	2012	Italy	382	M	Youth	T	*T*	IR, DB
Bortoli et al.	2011	Italy	320	MG	Youth	T	*T*	IR, DB, UdB
Bortoli et al.	2009	Italy	473	MG	Youth	Mix	*T*	PC, NE, Amot, M/TC, P/EC
Bossio	2009	Peru	111	M	Elite	T	*T*	PC
Brinkman-Majewski & Weiss	2015	USA	180	MG	University	Mix	*T*	NE
Calmeiro et al.	2015	Portugal	77	MG	Youth	Mix	*T*	PC, NE, ASF, MalSF
Carr & Wyon	2003	UK	181	MG	Mixed	I	*T*	PC, IM, EM
Cervelló et al.	2007	Spain	151	MG	Youth	I	*P*	PC, NE
Chin et al.	2012	Malaysia	632	MG	Youth	I	*T*	UdB
D'Arripe-Longueville et al.	2006	France	163	M	Youth	I	*P*	PC, PE, NE, M/TC, P/EC, UdB, IM, EM
de Bruin et al.	2009	The Netherlands	94	F	Youth	Mix	*T*	Amot, IM, EM
Digelidis et al.	2005	Greece	191	MG	Youth	Mix	*T*	PC, PE, NE, ASF
Duda	1989	USA	128	M	Youth	Mix	*T*	PC, M/TC, P/EC, ASF
Duica et al.	2014	Romania	116	MG	Elite	T	*T*	M/TC, P/EC
Elferink-Gemser et al.	2015	The Netherlands	63	MG	Mixed	I	*T*	PC, PE, M/TC, P/EC
Farkhondeh & Moghaddam	2015	Iran	150	M	Youth	I	*T*	PC, PE, NE, ASF
Feichtinger & Höner	2014	Germany	1804	M	Youth	T	*T*	PC, M/TC, P/EC, ASF, MalSF
Fernande Perez et al.	2014	Chile	183	M	Youth	T	*T*	SE, IR, ASF
Fernandes et al.	2012	Brazil	169	MG	Mixed	Mix	*T*	SE
Gencer	2010	Turkey	56	NS	Mixed	I	*T*	PC, M/TC, ASF
Gomes et al.	2011	Spain	80	MG	Mixed	I	*T*	M/TC, P/EC
Granero-Gallegos et al.	2015	Spain	247	F	Elite	T	*P*	PE, M/TC, P/EC
Grossbard et al.	2007	USA	106	MG	Youth	T	*P*	M/TC
Guest & White	2001	USA	171	MG	Youth	Mix	*T*	M/TC
Hall et al.	2007	UK	246	MG	Adult	I	*T*	PC, PE, NE
Hatzigeorgiadis	2002	UK	71	MG	University	T	*T*	PC
Hatzigeorgiadis & Biddle	1999	UK	182	MG	Mixed	I	*T*	PE, Amot, M/TC, P/EC
Hodge & Petlichkoff	2000	New Zealand	257	M	Mixed	T	*T*	PC, SE, MalSF
Hutzler et al.	2013	Israel	63	MG	Mixed	I	*T*	PC, NE
Jooste et al.	2015	South Africa	16	MG	Elite	T	*P*	PC, ASF
Kavussanu	2006	UK	325	M	Youth	I	*P*	PC, PE
Kavussanu & Boardley	2009	UK	106	MG	Mixed	T	*P*	PC, IR, Amot, M/TC, P/EC, IM, EM
Kavussanu & Harnisch	2000	USA	483	M	Youth	Mix	*P*	PC, PE, NE, ASF
Kavussanu & Roberts	2001	USA	143	F	University	T	*P*	PC, M/TC, P/EC
Kim & Gill	1997	South Korea	344	MG	Youth	Mix	*T*	IR, Amot, ASF, MalSF, IM, EM
Kim & Yang	2013	South Korea	225	MG	Mixed	Mix	*T*	NE, M/TC, P/EC, MalSF

Kim et al.	2011	Korea	404	MG	University	I	*T*	PC, NE, ASF, IM
Kim et al.	2003	USA	399	MG	Youth	Mix	*T*	M/TC, P/EC
Kristiansen et al.	2012	Norway	82	M	Elite	T	*P*	M/TC
Kristiansen et al.	2008	Mixed	82	MG	Elite	I	*P*	PC, ASF, MalSF, IM
Li & Chi	2007	China	109	MG	Youth	T	*T*	NE
Lochbaum & Podlog	2014	USA	112	M	Youth	T	*P*	M/TC, P/EC
Lu & Hsu	2015	Taiwan	252	MG	University	Mix	*T*	M/TC, P/EC
Machida et al.	2012	USA	206	MG	University	Mix	*T*	PC
Magyar & Feltz	2003	USA	180	F	Youth	T	*T*	PC, NE, MalSF
Magyar et al.	2004	USA	154	MG	Youth	T	*T*	PC, MalSF
Malete	2006	Botswana	716	MG	Youth	Mix	*T*	M/TC, P/EC
McArdle & Duda	2004	USA	196	MG	Mixed	T	*T*	SE, PE, ASF, MalSF, IM
Monacis et al.	2015	Italy	366	MG	Mixed	I	*T*	PC, NE, M/TC, P/EC
Moreno et al.	2010	Spain	413	MG	Youth	Mix	*P*	PC
Moreno Murcia et al.	2007	Spain	413	MG	Youth	T	*P*	PC, PE, ASF
Nerland & Saether	2016	Norway	140	M	Youth	T	*P*	M/TC, P/EC
Newton & Fry	1998	USA	137	MG	Masters	I	*T*	ASF
Ntoumanis & Biddle	1998	UK	146	MG	University	T	*T*	PC, M/TC, P/EC, ASF, MalSF
Ntoumanis et al.	1999	UK	356	MG	University	Mix	*T*	IR, Amot, ExR
Nunez et al.	2011	Spain	399	MG	Mixed	T	*T*	PC
Ommundsen & Pedersen	1999	Norway	136	F	Youth	Mix	*P*	PC, IR, IM, ExR
Ommundsen et al.	2005	Norway	1735	MG	Youth	T	*P*	DB, UdB
Ozer & Kocaeksi	2013	Turkey	41	M	Youth	T	*P*	ASF
Papaiannou et al.	2005	Greece	100	MG	Elite	I	*T*	PC, NE
Pensgaard	1999	Norway	18	F	Elite	T	*P*	M/TC, P/EC
Petherick & Weigand	2002	USA	177	MG	Youth	I	*T*	NE, ASF
Pineda-Espejel et al.	2015	Mexico	211	MG	University	Mix	*T*	PC, ASF
Rascle & Coulomb	2003	France	109	M	Youth	T	*P*	UdB
Rascle et al.	1998	France	120	M	Youth	T	*P*	M/TC, P/EC
Rodrigues et al.	2009	Portugal	45	MG	Adult	I	*T*	DB, UdB
Rottensteiner et al.	2015	Finland	1517	M	Youth	T	*P*	PC, NE, M/TC, P/EC, MalSF
Ryska et al.	2002	USA	186	MG	University	T	*P*	M/TC, P/EC, UdB, ASF
Sage & Kavussanu	2008	UK	180	MG	Youth	T	*P*	M/TC, P/EC, DB, UdB
Sage & Kavussanu	2007	UK	365	MG	Youth	T	*P*	DB
Saotome et al.	2012	Japan	146	M	Youth	T	*T*	M/TC, P/EC, ASF
Sas-Nowosielski & Swiatkowska	2008	Poland	830	MG	Mixed	Mix	*P*	NE, MalSF
Seifriz et al.	1992	USA	105	M	Youth	T	*T*	IR, Amot, IM, EM, ExR
Shields et al.	2015	USA	238	MG	University	Mix	*P*	DB, UdB
Silic et al.	2016	Croatia	302	MG	Youth	I	*T*	PC, ASF, MalSF
Sit & Linder	2007	Hong Kong	1214	MG	Youth	T	*T*	PC, M/TC, P/EC, DB
Stavrou et al.	2015	Greece	272	MG	Elite	I	*T*	M/TC, P/EC, DB, UdB
Stephens	1998	USA	212	F	Youth	T	*T*	M/TC, P/EC, UdB, ASF, MalSF
Stuntz & Weiss	2009	USA	303	MG	Youth	Mix	*T*	UdB
Tello et al.	2010	Spain	511	MG	Mixed	Mix	*T*	SE, PC, ASF
van de Pol & Kavussanu	2012	UK	348	MG	University	Mix	*P*	UdB
van de Pol & Kavussanu	2011	UK	116	MG	Mixed	T	*P*	SE, PC
Vazou	2010	UK	483	MG	Mixed	Mix	*T*	PC, NE
Veligekas et al.	2007	Greece	449	MG	Mixed	I	*P*	M/TC, P/EC
Voight et al.	2000	USA	196	F	Elite	T	*T*	UdB
Zason Chian & John Wang	2008	Singapore	306	MG	University	Mix	*T*	IR, Amot, IM, ExR

Note. F=female only sample, M=male only sample, MG=mixed gender sample, I=individual sport sample only, T=team sport sample only, Mix=at least one individual and team sport sample, *T*=TEOSQ, *P*=POSQ, ASF=adaptive success factors, MalSF=maladaptive success factors, PE=positive emotions, NE=negative emotions, DB=desirable behaviors, UdB=undesirable behaviors, Amot=amotivation, EM=extrinsic motivation, ER=external regulations, IR=internal regulations, IM=intrinsic motivation, M/TC=mastery/task climate, P/EC=performance/ego climate, PC=perceived competence, SE=trait self-esteem/concept.

Meta-analyzed correlate summary

A total of 772 correlates were extracted across the 15 categories. Of those 772 extracted correlates, 402 were for the task goal orientation and 370 for the ego goal orientation. 489 of the total correlations were measured with the TEOSQ and the remaining 283 with the POSQ. The specific number of correlations extracted by category, goal orientation, and goal orientation measure are found in Table 2. Perceived competence (k=144) was the most represented category while extrinsic motivation (k=12) was the least represented one.

Table 2 contains effect size statistics, a heterogeneity statistic, and publication bias statistics. Across nearly all of the 15 categories, the hypotheses concerning both goal orientations and correlates found within competitive sport were supported. Of the 30 meta-analyzed correlates, 8 fell below small in meaningfulness, 17 small in meaningfulness, and 5 medium in meaningfulness. The task goal orientation effect sizes were positively and significantly different than zero (Z statistic $p<.05$) for adaptive success factors (r_w=.29), desirable behaviors (r_w=.28), positive emotions (r_w=.35), extrinsic motivation (r_w=.20), external regulations (r_w=.20), internal regulations (r_w=.34), intrinsic motivation (r_w=.47), the mastery/task climate (r_w=.38), perceived competence (r_w=.26), and trait self-esteem (r_w=.35). The task goal orientation was negatively and significantly different than zero (Z statistic $p<.05$) for maladaptive success factors (r_w=-.12), undesirable behaviors (r_w=-.06), and amotivation (r_w=-.13). The ego goal orientation was positively and significantly different than zero (Z statistic $p<.05$) for adaptive success factors (r_w=.10), maladaptive success factors (r_w=.12), negative emotions (r_w=.11), undesirable behaviors (r_w=.23), amotivation (r_w=.16), extrinsic motivation (r_w=.28), external regulation (r_w=.21), intrinsic motivation (r_w=.14), performance/ego climate (r_w=.28), and perceived competence (r_w=.17).

In all but two cases (i.e. extrinsic motivation, external regulations) the effect sizes were significantly different ($p<.05$) between the task and ego goal orientations. Heterogeneity was generally high. Thus, moderation analyses were justified. Concerning publication bias, the fail-safe N values for all effect sizes ranged from 39 to 22,706 (M=2,268.48; SD=4664.59) with the conservative two-tailed test. For effect size values at least small in meaningfulness (r_w>.10), the fail-safe N values were all considerable in magnitude relative to the number of samples. Duval and Tweedie's (2000) trim and fill analysis for each effect size overall provide confidence along with the fail-safe N values that publication bias did not affect the results as in all but two instances the effect was estimated to be *larger* in magnitude as opposed to *smaller* in magnitude. Smaller in magnitude results would indicate less supportive studies were missing from the sampled studies. The largest change was in the trait self-esteem and ego goal relationship from a nonsignificant .09 to -.21. But, for the most, the effect size values changed very little though in a number of instances they changed from small/medium in meaningfulness to medium in meaningfulness. The task goal and intrinsic motivation effect size was estimated as large at .50. In summary, the trim and fill statistics strongly supported the fail-safe N findings that minimal adjustments were required and publication bias, the failure to publish non supportive findings, was not evident.

Table 2. Sample summary for the correlate categories

Categories	All	Task	Ego	TEOSQ	POSQ
Adaptive Success Factors (ASF)	92	47	45	52	40
Maladaptive Success Factors (MalSF)	44	22	22	32	12
Perceived Competence (PC)	144	74	70	104	40
Positive Emotions (PE)	32	19	13	32	0
Negative Emotions (NE)	111	56	55	75	36
Desirable Behaviors (DB)	26	13	13	8	18
Undesirable Behaviors (UdB)	40	19	21	9	31
External Regulations (ER)	18	9	9	4	14
Amotivation (Amot)	20	10	10	16	4
Extrinsic Motivation (EM)	12	6	6	10	2
Internal Regulations (IR)	37	22	15	17	20
Intrinsic Motivation (IM)	24	12	12	19	5
Mastery/Task Climate (M/TC)	79	42	37	52	27
Performance/Ego Climate (P/EC)	75	37	38	47	28
Trait Self Esteem (SE)	18	14	3	12	6
Totals	772	402	370	489	283

Table 3. Publication bias statistics for each correlate category by the two goal orientations

						Publication Bias Statistics		
		Effect Size Statistics				Fail-safe N	Trim and Fill	
Categories	k	r_w	LL	UL	I^2	N	N	r_c
Adaptive Success Factors								
Ego	45	.10	.05	.14	High	1,540	9	.15
Task	47	.29	.26	.33	High	3,202	5	.31
Maladaptive Success Factors								
Ego	22	.12	.07	.17	High	596	5	.08
Task	22	-.12	-.17	-.07	High	777	2	-.14
Positive Emotions								
Ego	13	.05[A]	-.02	.11	Medium	18	5	.11
Task	19	.35	.30	.40	High	2,874	1	.36
Negative Emotions								
Ego	55	.11	.08	.15	High	1,453	8	.07
Task	56	.01[A]	-.04	.06	High	17	17	.10
Desirable Behaviors								
Ego	13	-.05[A]	-.12	.02	Medium	24	3	-.10
Task	13	.28	.21	.34	High	840	2	.31
Undesirable Behaviors								
Ego	21	.23	.19	.27	Medium	1,166	2	.24
Task	19	-.06	-.11	-.01	Medium	39	5	-.02
Amotivation								
Ego	10	.16	.06	.25	High	158	3	.22
Task	10	-.13	-.24	-.03	High	86	0	
Extrinsic Motivation								
Ego	6	.28	.20	.36	Medium	190	1	.30
Task	6	.20	.03	.35	High	102	1	.26
External Regulations								
Ego	9	.21	.12	.30	High	349	0	
Task	9	.12	.05	.20	High	104	0	
Internal Regulations								
Ego	15	.08	.04	.19	Medium	207	5	.13
Task	22	.34	.29	.39	High	4,608	1	.33
Intrinsic Motivation								
Ego	12	.14	.04	.23	High	207	4	.20
Task	12	.47	.40	.54	High	2,634	2	.50
Mastery/Task Climate								
Ego	37	-.00[A]	-.06	.05	High	0	2	.01
Task	42	.38	.33	.42	High	5,124	11	.30
Performance/Ego Climate								
Ego	38	.28	.23	.32	High	6,616	5	.24
Task	37	-.03[A]	-.04	-.08	High	34	4	-.02
Perceived Competence								
Ego	70	.17	.15	.21	High	9,839	9	.21
Task	74	.26	.23	.26	High	23699	0	
Trait Self Esteem								
Ego	4	.09[A]	-.09	.26	High	0	2	-.21
Task	14	.35	.27	.42	Medium	1,551	3	.38

Note. [A] = r_w not significantly different from 0. Ego and task r not significantly different for external regulations and extrinsic motivation. LL=95% lower limit, UL=95% upper limit, r_c=trim and fill correct correlation.

Table 4. Moderator results

						Publication Bias Statistics		
	Effect Size Statistics				Heterogeneity	Fail-safe N	Trim and Fill	
Categories	k	r_w	LL	UL	I^2	N	N	r_c
Task Goal Orientation								
Desirable Behaviors								
POSQ	9	.24	.17	.31	Low	298	0	
TEOSQ	4	.37	.26	.46	High	133	1	.43
Internal Regulations								
POSQ	9	.27	.20	.34	High	807	2	.24
TEOSQ	13	.40	.34	.46	High	2,216	2	.44
Trait Self-Esteem								
POSQ	4	.42	.34	.50	Medium	233	2	.49
TEOSQ	10	.32	.27	.38	Medium	576	0	
Ego Goal Orientation								
Performance/Ego Climate								
POSQ	15	.35	.29	.42	Medium	1,291	3	.32
TEOSQ	24	.24	.19	.29	High	2,042	4	.21

Note. LL=95% lower limit, UL=95% upper limit, r_c=trim and fill correct correlation.

Moderation analysis summary

POSQ and TEOSQ effect sizes were calculated and statistically compared for both goal orientations within each of the 15 correlate categories. Table 4 contains the results. For the task goal orientation, three significant differences were found. The POSQ (r_w=.42) was significantly ($p<.05$) larger in magnitude for trait self-esteem/concept compared to the TEOSQ (r_w=.32). Duval and Tweedie's (2000) trim and fill analysis suggested a larger difference existed with POSQ effect size estimated at .49. The effect size values for the TEOSQ task orientation was significantly ($p<.05$) larger for desirable behaviors (TEOSQ r_w=.37; POSQ r_w=.24) and internal regulations (TEOSQ r_w=.40; POSQ r_w=.27) compared to the POSQ task orientation effect size values. Again, the Duval and Tweedie's (2000) trim and fill analysis suggested the differences were greater with the TEOSQ desirable behavior effect size estimated at .43 and the internal regulations effect size at .44 with the POSQ effect size actually being lower (r_w=.24) than found in the analyzed samples (r_w=.27). The fail-safe N values for these results ranged from 133 to 2,216. These fail-safe N values relative to the number of samples and the trim and fill findings strongly suggested that the results were not biased in favor of publication of only hypothesis supportive results or manuscripts were not filed away by researchers.

For the ego goal orientation, only the performance/ego climate was moderated by the goal orientation measure as presented in Lochbaum et al. (2016) such that the POSQ relationship (r_w=.35) was significantly greater than that of the TEOSQ (r_w=.24). Duval and Tweedie's (2000) trim and fill analysis suggested minimal adjustments to the effect size values. Publication bias appeared non-existent as the fail-safe N values were very large relative to the analyzed samples.

Discussion and conclusions

The study of achievement goal orientations has maintained a stronghold in the contemporary sport and physical activity literature as evidenced by a number of recent meta-analytic reviews (Lochbaum & Gottardy, 2014; Lochbaum, et al., 2015, 2016). This stronghold shows no sign of slowing down. The overall aim of this quantitative review was to examine whether correlates of the task and ego goal orientations were moderated by the goal orientation measure (i.e. the TEOSQ and POSQ). This seemingly very specific purpose stemmed from the findings of Lochbaum and his colleagues (2016) extensive review of 260 studies with the TEOSQ and POSQ with competitive sport participants. Their review was the first to demonstrate that POSQ overall endorsement of both goals was meaningfully larger compared to the TEOSQ in a quantitative review. To date in the body of competitive sport achievement goal literature, only Hanrahan and Biddle (2002) and Harwood (2002) have examined both questionnaires with the same sample.

Hanrahan and Biddle's (2002) data clearly revealed that the two measures shared only 24.01% for the task orientation and 31.36% variance for the ego goal orientation. These findings suggests that the two dominant achievement goal measures are not fully measuring the same constructs. Harwood presented data on both the TEOSQ and POSQ in two formats: dispositional and compe-

tition specific. The mean values for both orientations and questionnaires were higher in competition. But, the findings of Lochbaum et al. (2016) and Harwood (2002) in and of themselves is not of great concern *if* the two measures are consistently similar in their relationships with achievement variables of interest. Harwood (2002) did not examine additional achievement constructs such as positive emotion and unsportspersonlike behavior to investigate potential relationship differences. Based on the results of Lochbaum and colleagues' quantitative summary, the TEOSQ and POSQ did not measure in a similar fashion concerning a number of tested hypotheses. Lochbaum and his colleagues followed-up their findings with a correlate analysis. Specifically, they examined the relationships of the dichotomous goal orientations with motivation climate. The analyses with motivation climate suggested that the correlation between the ego goal orientation and the performance/ego climate was moderated by the goal orientation measure. The moderation was even more apparent for the PMCSQ-2. Certainly, if the two dominant goal orientation measures differ in relationships with a number of achievement goal orientation correlates as well as differing with categorical variables as reported by Lochbaum et al. (2016), then the achievement goal literature will be in a quandary.

Fortunately, across the 15 correlate categories and thus 30 possibilities of moderation, there were only three such findings in addition to the already known ego and performance/ego climate moderation results (Lochbaum, et al., 2016). The task goal relationships with desired behaviors, internal regulations, and trait self-esteem were moderated by the goal orientation questionnaire. Though the differences in the corrected correlations were significant, they all were small/moderate to moderate in meaningfulness. Thus, the direction and basic interpretations were similar. Concern would be much greater if one of the effect sizes was below small and the other medium to high in meaningfulness. Still, the reason for the differences are unknown and taken together with the categorical variable differences reported in Lochbaum et al. (2016) there is a need for future research to explore concurrently the POSQ and TEOSQ as the TEOSQ and POSQ items do differ.

The benefit of this a thorough examination of our overall aim was that the quantitative summary of the correlates and two goal orientations was first required. This summary alone is of great value to the contemporary study and future of the dichotomous goal orientations and achievement goal correlates. There has not been such a review since Biddle et al. (2003) meta-analysis of the dichotomous goals with 98 published studies using the TEOSQ and POSQ in both the sport and physical activity literature. This review only included competitive sport studies. While including fewer studies overall compared to Biddle and colleagues (2003), though with a comparable total number of participants, the present quantitative review meta-analyzed a far greater number of correlations. Regarding formed categories, the present review formed five more than the Biddle and his colleagues' meta-analysis and used a slightly different method of classification though certainly many categories were identical such as perceived competence and positive emotions. The overall results were consistent with past meta-analytic reviews (Ntoumanis & Biddle, 1999; Biddle, et al., 2003) as well as with the recent motivation climate meta-analytic review (Harwood, et al., 2015) in that the task goal was positively correlated with adaptive achievement strategies, positive emotions, desirable behaviors, mastery/task climate, intrinsic motivation, perceived competence, and trait self-esteem. The task goal orientation relationship with extrinsic motivation was unexpected as self-improvement is more logically tied to intrinsic motivation and internal regulations.

The ego goal was practically meaningless to small in meaningfulness related to all of the correlate categories. Based on the past reviews whether with the ego goal (Ntoumanis & Biddle, 1999; Biddle, et al., 2003) or with the performance/ego climate (Harwood, et al., 2015), these small in meaningfulness relationships were consistent. Though the ego goal orientation is certainly more related to what is considered maladaptive and/or less desirable achievement thoughts, emotions, and behaviors, this goal is certainly not related in a manner in which to cause great concern. Wanting to win certainly might move one to more undesirable behaviors, but with an overlap of just over 5% with such behaviors, the negative impact of endorsing an ego goal orientation appears minimal.

Limitations exist in the research process and should be acknowledged. For the most, the limitations across correlate meta-analyses are very similar. This review and formation of the 15 categories was dependent upon available correlations. Given the length of time this review covered, emails were not sent to ask for missing correlation data. Though not known as requests were not sent, it is most likely that data files would be missing across 25 years. Of the 270 identified investigations, about one-third provided suitable data. Certainly if all had provided data, perhaps the number of usable correlates would have been upwards of 2,000. By definition, correlate reviews are Category C evidence (Bouchard & Blair, 1999) as cause and effect statements are not possible. The categorization of the correlates was certainly a large undertaking and could be criticized. Certainly one method of categorization would have been by the correlate specific measure. For some measures, such as motivation climate, the literature was fairly consistent in using

only the PMCSQ and PMCSQ-2, but across all of the studies hundreds of measures were used. It was impractical to list all of the measures as individual categories. It is also possible to levy criticism concerning the moderation analysis. One could suggest running many more moderation analyses (e.g. sex of sample, sport type). Moderation analyses are interesting if carefully selected. Lochbaum et al. (2016) examined several long standing hypothesized moderates of the task and ego goal orientations. Whether the relationships with the goals should be moderated has need been forwarded in the literature. Thus, they were not conducted.

In conclusion, though limitations and criticisms always exist, taken together this review and Lochbaum et al. (2016) are of great importance to shaping the future of the dichotomous achievement goal in sport literature for several reasons. As stated in Lochbaum et al. (2016) the knowledge as to the extent of the literature seemed unknown. The body of literature is extensive in participant characteristics and constructs examined. Researchers should be able to quickly find relevant research studies with regard to participant samples and correlates to help formulate novel research questions. It is still an issue as to why the TEOSQ and POSQ at times seem to differ. The differences seem to pertain more to results found in Lochbaum et al. (2016) than in the present quantitative review. Understanding the similarities and differences in the two dominant goal orientation questionnaires is certainly needed. Gaining an understanding of the person-centered approach will be of great value and a logical extension of this meta-analytic summary. Examining correlations among four groups (high task/high ego, high task/low ego, low task/high ego, and low task/low ego) is a logical approach. Whether correlations differ among these groupings with achievement goal constructs is needed to best understand the impact of each goal orientation on achievement motivated thoughts, emotions, and behaviors in the ever growing and dynamic area of achievement goal theory.

References

Abrahamsen, F.E., Roberts, G.C., & Pensgaard, A.M. (2008). Achievement goals and gender effects on multidimensional anxiety in national elite sport. *Psychology of Sport and Exercise, 9*(4), 449-464. doi:10.1016/j.psychsport.2007.06.005

Allen, J., Taylor, J., Dimeo, P., Dixon, S., & Robinson, L. (2015). Predicting elite Scottish athletes' attitudes towards doping: Examining the contribution of achievement goals and motivational climate. *Journal of Sports Sciences*, *33*(9), 899-906. doi:10.1080/02640414.2014.976588

Ames, C. (1987). The enhancement of student motivation. In M.L. Maehr & D.A. Kleiber (Eds.), *Advances in motivation and achievement*: *Enhancing motivation* (Vol. 5, pp. 123-148). Greenwich, CT: JAI Press.

Asghar, E., Wang, X., Linde, K., & Alfermann, D. (2013). Comparisons between Asian and German male adolescent athletes on goal orientation, physical self-concept, and competitive anxiety. *International Journal of Sport and Exercise Psychology*, *11*(3), 229-243. doi:10.1080/1612197X.2013.748999

Atkins, M.R., Johnson, D.M., Force, E.C., & Petrie, T.A. (2015). Peers, parents, and coaches, oh my! The relation of the motivational climate to boys' intention to continue in sport. *Psychology of Sport and Exercise*, *16*, 170-180. doi:10.1016/j.psychsport.2014.10.008

Balaguer, I., Duda, J., Atienza, F., & Mayo, C. (2002). Situational and dispositional goals as predictors of perceptions of individual and team improvement, satisfaction and coach ratings among elite female handball teams. *Psychology of Sport and Exercise*, *3*(4), 293-308. doi:10.1016/s1469-0292(01)00025-5

Barić, R., Erpic, S., & Babic, V. (2002). Intrinsic motivation and goal orientation in track-and-field children. *Kinesiology*, *34*(1), 50-60.

Biddle, S.J.H., Wang, C.K.J., Kavussanu, M., & Spray, C.M. (2003). Correlates of achievement goal orientations in physical activity: A systematic review of research. *European Journal of Sport Science*, *3*(5), 1-20. doi:10.1080/17461390300073504

Biostat, Inc. (2011). *Comprehensive Meta-Analysis*, version 2.2.064. Computer software. Englewood, NJ: Biostat, Inc.

Bortoli, L., Bertollo, M., Comani, S., & Robazza, C. (2011). Competence, achievement goals, motivational climate, and pleasant psychobiosocial states in youth sport. *Journal of Sports Sciences*, *29*(2), 171-180. doi:10.1080/02640414.2010.530675

Bortoli, L., Bertollo, M., & Robazza, C. (2009). Dispositional goal orientations, motivational climate, and psychobiosocial states in youth sport. *Personality and Individual Differences*, *47*(1), 18-24. doi:10.1016/j.paid.2009.01.042

Bortoli, L., Messina, G., Zorba, M., & Robazza, C. (2012). Contextual and individual influences on antisocial behaviour and psychobiosocial states of youth soccer players. *Psychology of Sport and Exercise*, *13*(4), 397-406. doi:10.1016/j.psychsport.2012.01.001

Bossio, M.R. (2009). Clima motivacional y orientacion de meta en futbolistas peruanos de primera division. [Motivational climate and goal orientation in soccer players of first division. In Spanish.] *Cuadernos de Psicología del Deporte*, *9*(1), 5-19.

Bouchard, C., & Blair, S.N. (1999). Introductory comments for the consensus on physical activity and obesity. *Medicine and Science in Sports and Exercise, 31*(Supplement 1), S498. doi:10.1097/00005768-199911001-00002

Brinkman-Majewski, R.E., & Weiss, W.M. (2015). Examination of the motivational climate in the athletic training room. *Journal of Sport Behavior*, *38*(2), 143.

Calmeiro, L., Stoll, S.K., & Davis, P. (2015). Moral reasoning in sport: Validation of the Portuguese version of the RSBH Value-Judgement Inventory in adolescents. *Sport Science Review, 24(*5-6), 285-304.

Carr, S., & Wyon, M. (2003). The impact of motivational climate on dance students' achievement goals, trait anxiety, and perfectionism. *Journal of Dance Medicine and Science*, *7*(4), 105-114.

Cervelló, E., Santos Rosa, F.J., Calvo, T.G., Jiménez, R., & Iglesias, D. (2007). Young tennis players' competitive task involvement and performance: The role of goal orientations, contextual motivational climate, and coach-initiated motivational climate. *Journal of Applied Sport Psychology*, *19*(3), 304-321. doi:10.1080/10413200701329134

Cohen, J. (1990). Things I have learned (so far). *American Psychologist*, *45*(12), 1304-1312. doi:10.1037//0003-066x.45.12.1304

D'Arripe-Longueville, F., Pantaléon, N., & Smith, A.L. (2006). Personal and situational predictors of sportspersonship in young athletes. *International Journal of Sport Psychology*, *37*(1), 38-57.

de Bruin, A.K., Bakker, F.C., & Oudejans, R.R. (2009). Achievement goal theory and disordered eating: Relationships of disordered eating with goal orientations and motivational climate in female gymnasts and dancers. *Psychology of Sport and Exercise, 10*(1), 72-79. doi:10.1016/j.psychsport.2008.07.002

Digelidis, N., Kotsaki, Z., & Papaioannou, A. (2005). Διαφορές μεταξύ μαθητών τμημάτων αθλητικής Διευκόλυνσης γυμνασίου και λυκείου ως προς την εσωτερική-εξωτερική παρακίνηση, τους προσωπικούς προσανατολισμούς, την αντίληψη αθλητικής ικανότητας και το κλίμα παρακίνησης. [Differences between junior and senior high school students concerning intrinsic-extrinsic motivation in the contextual level, goal orientations, motivational climate and perceived athletic ability in Greek athletic classes. In Greek.] *Inquiries in Sport and Physical Education*, *3*(1), 77-89.

Duda, J.L. (1989). Relationship between task and ego orientation and the perceived purpose of sport among high school athletes. *Journal of Sport and Exercise Psychology*, *11*(3), 318-335.

Duda, J.L., & Nicholls, J.G. (1992). Dimensions of achievement motivation in schoolwork and sport. *Journal of Educational Psychology*, *84*(3), 290-299. doi:10.1037/0022-0663.84.3.290

Duică, S., Balázsi, R., Ciulei, R., & Bivolaru, A. (2014). The mediating role of coping strategies between achievement goals and competitive anxiety in elite sport: A path analytic study. *Cognition, Brain, Behavior: An Interdisciplinary Journal*, *18*(2), 109-124.

Duval, S., & Tweedie, R. (2000). Trim and Fill: A simple funnel-plot-based method of testing and adjusting for publication bias in meta-analysis. *Biometrics, 56(2),* 455-463. doi.org/10.1111/j.0006-341x.2000.00455.x.

Dweck, C.S., & Elliot, E.S. (1983). Achievement motivation. In P. Mussen (Ed.), *Handbook of child psychology* (pp. 643-691). New York: John Wiley.

Egger, M., Davey Smith, G., Schneider, M., & Minder, C. (1997). Bias in meta-analysis detected by a simple, graphical test. *British Medical Journal, 315,* 629-634.

Elferink-Gemser, M.T., Roos, I.D., Torenbeek, M., Fokkema, T., Jonker, L., & Visscher, C. (2016). The importance of psychological constructs for training volume and performance improvement. A structural equation model for youth speed skaters. *International Journal of Sport Psychology, 47*(1), 726-744.

Farkhondeh, H., & Moghaddam, J.B. (2015). The relationship between competitive anxiety with performance of young wrestlers in championship tournaments. *Journal of Sport Research*, *1*(5), 53-56.

Feichtinger, P., & Höner, O. (2014). Psychological diagnostics in the talent development program of the German Football Association: Psychometric properties of an Internet-based test battery. *Sportwissenschaft, 44*(4), 203–213. doi:10.1007/s12662-014-0341-0

Fernandes, M.G., Vasconcelos-Raposo, J., & Fernandes, H.M. (2012). Relação entre orientações motivacionais, ansiedade e autoconfiança, e bem-estar subjetivo em atletas Brasileiros. [Relationship between achievement goals, anxiety and self-confidence, and subjective well-being in Brazilian athletes. In Portuguese.] *Motricidade*, *8*(3), 4-18.

Fernández Pérez, R.C., Yagüe Cabezón, J.M., Molinero González, O., Márquez Rosa, S., & Salguero del Valle, A.S. (2014). Análisis de las diferencias motivacionales entre el fútbol 7 y el fútbol 11. [Analysis of motivational differences between football 7 and 11. In Spanish.] *Cuadernos de Psicología del Deporte*, *14*(2), 47-58.

Gencer, E. (2010). The relationship between locus of control, self-esteem and goal orientation, motivational climate in badminton players. *Ovidius University Annals, Series Physical Education and Sport Science, Movement and Health*, *10*(2), 157-162.

Gomes, A.R., Martins, C., & Silva, L. (2011). Eating disordered behaviours in Portuguese athletes: The influence of personal, sport, and psychological variables. *European Eating Disorders Review*, *19*(3), 190-200. doi:10.1002/erv.1113

Granero-Gallegos, A., Gómez-López, M., Abraldes, J.A., & Baena-Extremera, A. (2015). Predicción de las orientaciones de meta en el futbol femenino. [Prediction of goal orientation in female football. In Spanish.] *Journal of Sport and Health Research, 7*(1), 31-42.

Guest, S., & White, S. (2001). A cross-situational investigation of goal orientations and perceived motivational climate in a physical education class and an organized sport setting. *International Sports Journal*, *5*(1), 101-117.

Hall, H.K., Kerr, A.W., Kozub, S.A., & Finnie, S.B. (2007). Motivational antecedents of obligatory exercise: The influence of achievement goals and multidimensional perfectionism. *Psychology of Sport and Exercise*, *8*(3), 297-316. doi:10.1016/j.psychsport.2006.04.007

Harwood, C.G., Keegan, R.J., Smith, J.M.J., & Raine, A.S. (2015). A systematic review of the intrapersonal correlates of motivational climate perceptions in sport and physical activity. *Psychology of Sport and Exercise, 18,* 9-25. doi:10.1016/j.psychsport.2014.11.005

Hatzigeorgiadis, A., & Biddle, S. (1999). The effects of goal orientation and perceived competence on cognitive interference during tennis and snooker performance. *Journal of Sport Behavior*, *22*(4), 479-501.

Hedges, L.V., & Olkin, I. (1985). *Statistical methods for meta-analysis*. Orlando, FL: Academic Press. doi:10.1016/b978-0-08-057065-5.50006-3

Higgins J.P., & Thompson, S.G. (2002). Quantifying heterogeneity in a meta-analysis. *Statistics in Medicine, 21,* 1539-1558.

Higgins, J.P.T., Thompson S.G., Deeks, J.J., & Altman, D.G. (2003). Measuring inconsistency in meta-analysis. *British Medical Journal, 327*(7414), 557-560.

Hodge, K., & Petlichkoff, L. (2000). Goal profiles in sport motivation: A cluster analysis. *Journal of Sport and Exercise Psychology*, *22*(3), 256-272.

Hutzler, Y., Oz, M., & Barak, S. (2013). Goal perspectives and sport participation motivation of Special Olympians and typically developing athletes. *Research in Developmental Disabilities*, *34*(7), 2149-2160. doi:10.1016/j.ridd.2013.03.019

Jooste, J., Kubayi, N.A., & Paul, Y. (2015). Dimensions of achievement goal orientation and coping in South African wheelchair rugby players with quadriplegia. *Journal of Psychology in Africa*, *25*(4), 345-349.

Kavussanu, M., & Boardley, I.D. (2009). The prosocial and antisocial behavior in sport scale. *Journal of Sport and Exercise Psychology*, *31*(1), 97-117.

Kavussanu, M., & Harnisch, D.L. (2000). Self-esteem in children: Do goal orientations matter? *British Journal of Educational Psychology*, *70*(2), 229-242. doi:10.1348/000709900158074

Kavussanu, M., & Roberts, G.C. (2001). Moral functioning in sport: An achievement goal perspective. *Journal of Sport and Exercise Psychology*, *23*(1), 37-54.

Kim, M.S., Duda, J.L., & Gano-Overway, L. (2011). Predicting occurrence of and responses to psychological difficulties: The interplay between achievement goals, perceived ability, and motivational climates among Korean athletes. *International Journal of Sport and Exercise Psychology*, *9*(1), 31-47. doi:10.1080/1612197x.2011.563125

Kim, B.J., & Gill, D.L. (1997). A cross-cultural extension of goal perspective theory to Korean youth sport. *Journal of Sport and Exercise Psychology*, *19*(2), 142-155.

Kim, B.J., Williams, L., & Gill, D.L. (2003). A cross-cultural study of achievement orientation and intrinsic motivation in young USA and Korean athletes. *International Journal of Sport Psychology*, *34*(2), 168-184.

Kim, S.U., & Yang, M.H. (2013). The effect of goal orientation on antisocial behavior in taekwondo and football players: The mediating role of moral disengagement. *The Korean Journal of Physical Education, 52*(1), 163-174.

Kristiansen, E., Halvari, H., & Roberts, G.C. (2012). Organizational and media stress among professional football players: Testing an achievement goal theory model. *Scandinavian Journal of Medicine and Science in Sports*, *22*(4), 569-579. doi:10.1111/j.1600-0838.2010.01259.x

Kristiansen, E., Roberts, G.C., & Abrahamsen, F.E. (2008). Achievement involvement and stress coping in elite wrestling. *Scandinavian Journal of Medicine and Science in Sports*, *18*(4), 526-538. doi:10.1111/j.1600-0838.2007.00646.x

Li, C., & Chi, L. (2007). Prediction of goal orientation and perceived competence on intensity and direction of precompetitive anxiety among adolescent handball players. *Perceptual and Motor Skills*, *105*(1), 83-101. doi:10.2466/PMS.105.5.83-101

Lochbaum, M., & Gottardy, J. (2015). A meta-analytic review of the approach-avoidance achievement goals and performance relationships in the sport psychology literature. *Journal of Sport and Health Science, 4*(2), 164-173. doi:10.1016/j.jshs.2013.12.004

Lochbaum, M., Jean-Noel, J., Pinar, C., & Gilson, T. (in press). A meta-analytic review of Elliot's (1999) *hierarchical model of approach and avoidance motivation* in the sport, physical activity, and physical education literature. *Journal of Sport and Health Science*. doi: 10.1016/j.jshs.2015.07.008

Lochbaum, M., Kazak Çetinkalp, Z., Graham, K., Wright, T., & Zazo, R. (2016). Task and ego goal orientations in competitive sport: A quantitative review of the literature from 1989 to 2016. *Kinesiology, 48*, 3-29.

Lochbaum, M.R., & Podlog, L.W. (2014). Mental toughness and pre-game mental states in adolescent football players: The mediating role of achievement goals. *Uchenye zapiski universiteta imeni P.F. Lesgafta, 12* (118), 262-266. doi: 10.5930/issn.1994-4683.2014.12.118.p262-266

Lu, F.J., & Hsu, Y. (2015). The interaction between paternalistic leadership and achievement goals in predicting athletes' sportspersonship. *Kinesiology, 47*(1), 115-122.

Machida, M., Marie Ward, R., & Vealey, R.S. (2012). Predictors of sources of self-confidence in collegiate athletes. *International Journal of Sport and Exercise Psychology*, *10*(3), 172-185. doi:10.1080/1612197x.2012.672013

Maehr, M.L. (1984). Meaning and motivation: Toward a theory of personal investment. In C. Ames & R. Ames (Eds.), *Research on motivation in education* (Vol. 1, pp. 115-144). New York: Academic Press.

Magyar, T.M., & Feltz, D.L. (2003). The influence of dispositional and situational tendencies on adolescent girls' sport confidence sources. *Psychology of Sport and Exercise*, *4*(2), 175-190. doi:10.1016/S1469-0292(01)00037-1

Magyar, T.M., Feltz, D.L., & Simpson, I.P. (2004). Individual and crew level determinants of collective efficacy in rowing. *Journal of Sport and Exercise Psychology*, *26*(1), 136-153.

Malete, L. (2006). Goal orientations, sport ability, perceived parental influences and youths enjoyment of sport and physical activity in Botswana. *International Journal of Applied Sports Sciences, 18*(2), 89-107.

McArdle, S., & Duda, J.L. (2004). Exploring social-contextual correlates of perfectionism in adolescents: A multivariate perspective. *Cognitive Therapy and Research*, *28*(6), 765-788. doi:10.1007/s10608-004-0665-4

Moher, D. (2009). Preferred reporting items for systematic reviews and meta-analyses: The PRISMA statement. *Annals of Internal Medicine, 151*(4), 264-270. doi:10.7326/0003-4819-151-4-200908180-00135

Monacis, L., de Palo, V., & Sinatra, M. (2015). Factores motivacionales relacionados con la agresividad en las artes marciales. [Motivational factors related to aggression within martial arts context. In Spanish.] *Revista de Psicología del Deporte*, *24*(1), 163-169.

Moreno Murcia, J.A., Cervelló, E., & González-Cutre Coll, D. (2007). Analizando la motivación en el deporte: Un estudio a través de la teoría de la autodeterminación. [Analyzing motivation in sport: A study through self-determination theory. In Spanish.] *Apuntes de Psicología*, *25*(1), 35-51.

Nerland, E., & Saether, S.A. (2016). Norwegian football academy players–players self-assessed competence, perfectionism, goal orientation and motivational climate. *Sport Mont, 14*(2), 7-11.

Newton, M., Duda, J.L., & Yin, Z. (2000). Examination of the psychometric properties of the Perceived Motivational Climate in Sport Questionnaire-2 in a sample of female athletes. *Journal of Sports Sciences*, *18*(4), 275-290.

Newton, M., & Fry, M.D. (1998). Senior Olympians' achievement goals and motivational responses. *Journal of Aging and Physical Activity*, *6*(3), 256-270.

Nicholls, J.G. (1980). An intentional theory of achievement motivation. In W.U. Meyer & B. Weiner (Chairpersons), *Attributional approaches to human behavior.* Symposium presented at the Center for Interdisciplinary Studies, University of Bielefeld, Germany, August.

Nicholls, J.G. (1984). Conceptions of ability and achievement motivation. In R. Ames & C. Ames (Eds.), *Research on motivation in education*: *Student motivation* (Vol. 1, pp. 39-73). New York: Academic Press.

Nicholls, J.G. (1989). *The competitive ethos and democratic education*. Cambridge, MA: Harvard University Press.

Ntoumanis, N., & Biddle, S. (1998). The relationship between competitive anxiety, achievement goals, and motivational climates. *Research Quarterly for Exercise and Sport*, *69*(2), 176-187. doi:10.1080/02701367.1998.10607682

Ntoumanis, N., & Biddle, S.J.H. (1999). Affect and achievement goals in physical activity: A meta-analysis. *Scandinavian Journal of Medicine and Science in Sports, 9*(6), 315-332. doi:10.1111/j.1600-0838.1999.tb00253.x

Ommundsen, Y., & Pedersen, B.H. (1999). The role of achievement goal orientations and perceived ability upon somatic and cognitive indices of sport competition trait anxiety: A study of young athletes. *Scandinavian Journal of Medicine and Science in Sports*, *9*(6), 333-343. doi:10.1111/j.1600-0838.1999.tb00254.x

Ommundsen, Y., Roberts, G.C., Lemyre, P.N., & Miller, B.W. (2005). Peer relationships in adolescent competitive soccer: Associations to perceived motivational climate, achievement goals and perfectionism. *Journal of Sports Sciences, 23*(9), 977-989. doi:10.1080/02640410500127975

Ozer, B., & Kocaeksi, S. (2013). Soccer players' efficacy belief, CSAI-2C, SCAT perceptions of success comparison. *Turkish Journal of Sport and Exercise, 15*(2), 88-93.

Papaioannou, A., Kourtesopoulou, A., & Konstandakatou, B. (2005). Εσωτερική παρακίνηση και στόχοι επίτευξης αθλητών αναρρίχησης. [Intrinsic motivation and task and ego orientation in athletes of climbing. In Greek.] *Inquiries in Sport and Physical Education*, *3*(1), 13-21.

Petherick, C.M., & Weigand, D.A. (2002). The relationship of dispositional goal orientations and perceived motivational climates on indices of motivation in male and female swimmers. *International Journal of Sport Psychology*, *33*(2), 218-237.

Pineda-Espejel, H.A., López-Walle, J., & Tomás, I. (2015). Factores situacionales y disposicionales como predictors de la ansiedad y autoconfanza precompetitiva en deportistas universitarios. [Situational and dispositional factors as predictors of precompetitive anxiety and self-confidence in college athletes. In Spanish.] *Cuadernos de Psicología del Deporte*, *15*(2), 55-70.

Rascle, O., & Coulomb, G. (2003). Aggression in youth handball: Relationships between goal orientations and induced motivational context. *Social Behavior and Personality*, *31*(1), 21-34. doi:10.2224/sbp.2003.31.1.21

Rascle, O., Coulomb, G., & Pfister, R. (1998). Aggression and goal orientations in handball: Influence of institutional sport context. *Perceptual and Motor Skills*, *86*(3c), 1347-1360. doi: 10.2466/pms.1998.86.3c.1347

Roberts, G.C., & Balagué, G. (1989). The development of a social-cognitive scale of motivation. Paper presented at the *Seventh World Congress of Sport Psychology*, Singapore, July, 1989.

Roberts, G.C., & Balagué, G. (1991). The development and validation of the Perception of Success Questionnaire. Paper presented at the *8th European Congress* (FEPSAC), Cologne, Germany, July, 1991.

Roberts, G.C., Treasure, D.C., & Balagué, G. (1998). Achievement goals in sport: The development and validation of the Perception of Success Questionnaire. *Journal of Sports Sciences, 16*(4), 337-347. doi:10.1080/02640419808559362

Rodrigues, A.D., Lázaro, J.P., Fernandes, H.M., & Vasconcelos-Raposo, J. (2009). Caracterização dos níveis de negativismo, activação, autoconfiança e orientações motivacionais de alpinistas. [Characterization of the negativism, activation, self-confidence and cognitive orientations levels of alpinists. In Portuguese.] *Motricidade*, *5*(2), 63-86.

Rosenthal, R. (1979). The file drawer problem and tolerance for null results. *Psychological Bulletin, 86*, 638-641.

Rottensteiner, C., Tolvanen, A., Laakso, L., & Konttinen, N. (2015). Youth athletes' motivation, perceived competence, and persistence in organized team sports. *Journal of Sport Behavior, 38*(4), 1-18.

Ryska, T.A. (2001-2002). Self-esteem among intercollegiate athletes: The role of achievement goals and competitive orientation. *Imagination, Cognition and Personality*, *21*(1), 67-80. doi:10.2190/D6R7-KGFM-HALC-UPB7

Sage, L., & Kavussanu, M. (2007). Multiple goal orientations as predictors of moral behavior in youth soccer. *Sport Psychologist*, *21*(4), 417-437.

Sage, L.D., & Kavussanu, M. (2008). Goal orientations, motivational climate, and prosocial and antisocial behaviour in youth football: Exploring their temporal stability and reciprocal relationships. *Journal of Sports Sciences, 26*(7), 717-732. doi:10.1080/02640410701769716

Saotome, H., Harada, K., & Nakamura, Y. (2012). The relationship between change in perceived motivational climate and change in goal orientations among Japanese ice hockey players. *International Journal of Sports Science and Coaching*, *7*(1), 81-88. doi:10.1260/1747-9541.7.1.81

Sas-Nowosielski, K., & Swiatkowska, L. (2008). Goal orientations and attitudes toward doping. *International Journal of Sports Medicine*, *29*(7), 607-612. doi:10.1055/s-2007-965817

Seifriz, J.J., Duda, J.L., & Chi, L. (1992). The relationship of perceived motivational climate to intrinsic motivation and beliefs about success in basketball. *Journal of Sport and Exercise Psychology*, *14*(4), 375-391.

Shields, D.L., Funk, C.D., & Bredemeier, B.L. (2015). Contesting orientations: Measure construction and the prediction of sportspersonship. *Psychology of Sport and Exercise*, *20*, 1-10. doi:10.1016/j.psychsport.2015.03.008

Šilić, N., Sesar, K., & Brekalo, M. (2016). Interactive effects of goal orientation and perceived competence on enjoyment among youth swimmers. *International Journal of Psychological Studies, 8*(3), 40-49. doi:10.5539/ijps.v8n3p40

Sit, C.P., & Lindner, K.J. (2007). Achievement goal profiles, perceived ability and participation motivation for sport and physical activity. *International Journal of Sport Psychology*, *38*(3), 283-303.

Stavrou, N.A.M., Psychountaki, M., Georgiadis, E., Karteroliotis, K., & Zervas, Y. (2015). Flow theory–Goal orientation theory: Positive experience is related to athlete's goal orientation. *Frontiers in Psychology*, *6*, 1499. doi:10.3389/fpsyg.2015.01499

Stephens, D.E. (1998). The relationship of goal orientation and perceived ability to enjoyment and value in youth sport. *Pediatric Exercise Science*, *10*, 236-247.

Stuntz, C.P., & Weiss, M.R. (2009). Achievement goal orientations and motivational outcomes in youth sport: The role of social orientations. *Psychology of Sport and Exercise*, *10*(2), 255-262. doi:10.1016/j.psychsport.2008.09.001

Tello, F.H., Martínez, L.N., Núñez, M.L., & Calvo, T.G. (2010). A structural model of goal orientation in sports: Personal and contextual variables. *The Spanish Journal of Psychology*, *13*(1), 257-266. doi:10.1017/S1138741600003838

Treasure, D.C., & Roberts, G.C. (1994). Cognitive and affective concomitants of task and ego goal orientations during the middle school years. *Journal of Sport and Exercise Psychology*, *16*(1), 15-28.

van de Pol, P.K., & Kavussanu, M. (2011). Achievement goals and motivational responses in tennis: Does the context matter? *Psychology of Sport and Exercise*, *12*(2), 176-183. doi:10.1016/j.psychsport.2010.09.005

van de Pol, P.K., & Kavussanu, M. (2012). Achievement motivation across training and competition in individual and team sports. *Sport, Exercise, and Performance Psychology*, *1*(2), 91-105. doi:10.1037/a0025967

Vazou, S. (2010). Variations in the perceptions of peer and coach motivational climate. *Research Quarterly for Exercise and Sport*, *81*(2), 199-211. doi:10.5641/027013610x13088554297279

Veligekas, P., Mylonas, K., & Zervas, Y. (2007). Goal orientation and beliefs about the causes of success among Greek track and field athletes. *Perceptual and Motor Skills*, *105*(3), 927-938. doi:10.2466/PMS.105.7.927-938

Voight, M.R., Callagham, J.L., & Ryska, T.A. (2000). Relationship between goal orientations, self-confidence and multidimensional trait anxiety among Mexican-American female youth athletes. *Journal of Sport Behavior*, *23*(3), 271-288.

Zason Chian, L.K., & John Wang, C.K. (2008). Motivational profiles of junior college athletes: A cluster analysis. *Journal of Applied Sport Psychology*, *20*(2), 137-156. doi:10.1080/10413200701805265

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