

5-28-2020

Strength and Conditioning Coaches' Perceptions of Sport Psychology Strategies

Alessandro Quartiroli
University of Wisconsin La Crosse

Erin Whitney Grandy Moore
Wayne State University, whitneymoore@wayne.edu

Rebecca A. Zakrajsek
University of Tennessee

Follow this and additional works at: https://digitalcommons.wayne.edu/coe_khs

 Part of the [Education Commons](#), [Kinesiology Commons](#), and the [Sports Sciences Commons](#)

Recommended Citation

Quartiroli, A., Moore, E. W. G., & Zakrajsek, R. A. (2021). Strength and conditioning coaches' perceptions of sport psychology strategies. *The Journal of Strength and Conditioning Research*. DOI: [10.1519/JSC.0000000000003651](https://doi.org/10.1519/JSC.0000000000003651)

This Article is brought to you for free and open access by the College of Education at DigitalCommons@WayneState. It has been accepted for inclusion in Kinesiology, Health and Sport Studies by an authorized administrator of DigitalCommons@WayneState.

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22

Strength and conditioning coaches' perceptions of sport psychology
strategies.

Author #1*

Institution #1

Author #2

Institution #2

Author #3

Institution #3

*Corresponding author:

1 Abstract

2 Strength and conditioning coaches (SCCs) hold a central role in the development of
3 student-athletes. While they certainly focus on student-athletes' physical skills
4 development, SCCs are in an ideal position to integrate mental skills into their strength and
5 conditioning sessions. For example, sport psychology (SP) strategies can be used within
6 strength and conditioning sessions to assist in athlete exercise execution by regulating
7 arousal, improving concentration, confidence, as well as improve self-correction through
8 self-talk and imagery. The purpose of this study was to assess collegiate SCCs use of sport
9 psychology (SP) skills/strategies. A total sample of 415 SCCs (19.7% return rate) across
10 the United States participated in an online survey. While the majority of these coaches
11 reported having less than moderate training in SP (59.9%), they also reported a moderate to
12 high use of certain SP strategies (e.g., goal setting, self-talk). SCCs' familiarity with,
13 knowledge of, and confidence to use the SP strategies were found to be predictors of SCCs
14 frequency of SP strategy use. This study aimed to provide an initial exploration of SCCs
15 understanding and use of specific SP strategies, which was influenced by the SCCs
16 perceived level of preparation to use these strategies. For SCCs to be able to purposefully
17 and confidently incorporate SP strategies into training sessions, the current study suggests
18 the need for specific training aimed to enhance the SCCs' knowledge of and confidence in
19 using specific SP strategies.

20

21

22

23

24 Keywords: Coaching, College, Performance

1 Strength and conditioning coaches' perceptions of sport psychology
2 strategies.

3 INTRODUCTION

4 Strength and conditioning coaches (SCCs) play a central role in the personal and
5 athletic development of student-athletes (20, 29, 30). SCCs have the important
6 responsibility of training athletes year-round; and since, SCCs do not make scholarship or
7 starting position decisions, they have the opportunity to interact with athletes without the
8 athletes feeling anxious regarding their starting position or scholarship (14). This unique
9 role played by SCCs can benefit the development of relationships and rapport with athletes
10 based on trust and fostering athletes' motivation and performance during training sessions
11 (3, 14, 20, 29).

12 Due to the nature of the field, SCCs are required to draw on knowledge from a
13 variety of disciplines, including sport psychology (SP) (27, 29). The importance of SP
14 knowledge, skills and strategies (skills/strategies) as a scientific foundation of SCCs was
15 strengthened when the National Strength and Conditioning Association (NSCA) published
16 its Educational Recognition Program (22) and then Accreditation criterion (23). In these
17 guidelines the NSCA suggested that the use of SP skills/strategies (SP skills/strategies)
18 enables SCCs to enhance the training and/or performance of their athletes. Based on their
19 constant interaction with athletes, SCCs could be in an ideal position to contribute to the SP
20 aspects of athletes' personal development, as well as their sport performance (1, 27). For
21 this reason, in addition to teaching athletes exercise techniques, SCCs could integrate
22 support of athletes' development of select SP techniques and applications into training
23 sessions (19, 27).

24 Despite this recognition of the value of SP skills/strategies in strength and

1 conditioning (S&C), the extent to which these skills are incorporated into practices is still
2 unclear, as most research seems to predominantly focus on physical training strategies (4,
3 17). Only a few studies attempted to explore how SCCs use psychological strategies in
4 their practice (8, 9). It is only recently that researchers have started to pay attention to
5 which SP strategies were most implemented and the importance that SCCs attributed to SP
6 strategies and services (27). As an attempt to begin bridging the gap in the literature,
7 Radcliffe et al. (27) surveyed certified S&C practitioners from Australia, the United
8 Kingdom, and the United States about their perceptions of SP skills in their practice.
9 Results revealed that SCCs perceived motivation, confidence, and commitment to be the
10 most relevant and important SP attributes for performance success within the context of
11 S&C. In addition, participants ranked their use of SP strategies and found that certain SP
12 strategies were used more frequently than others. Similar to research conducted with sport
13 coaches and athletic trainers (5, 33), SCCs reported using the SP strategies of goal setting
14 most frequently, but also unlike sport coaches, SCCs' also frequently used self-talk,
15 adherence, activation, and stress management strategies.

16 These results are in line with and provide initial support for the SP skills suggested
17 by Mellaieu and Shearer (19) as important to integrate into S&C practice: goal setting,
18 imagery, self-talk, and activation management. Radcliffe et al.'s (27) results helped to
19 move forward the study of SP knowledge, skills, and strategies within the S&C field. More
20 recently, qualitative analysis of interviews with SCCs revealed two themes (i.e., internal
21 and external sources) for barriers to SCCs' implementation of SP strategies (28). The
22 internal barriers reported by the SCCs, included personal lack of knowledge of the
23 efficiency of different SP strategy interventions, value of SP strategies within S&C context,
24 and confidence to incorporate or demonstrate SP strategies. The external barriers were

1 As the purpose of this study was to examine SCCs' self-perceptions regarding their use of
2 SP skills/strategies collecting self-report data was appropriate.

3 The Psychological Skills Questionnaire (33) was used to measure the SCCs'
4 perceptions and use of SP strategies. A definition of each strategy was included to help
5 participants understand the terminology before they were asked to rate their (1) familiarity
6 with the SP skill/strategy [FAMILIARITY], (2) frequency of SP skill/strategy use
7 [FREQUENCY], (3) perceptions of how much their training provided them with the
8 knowledge of the specific SP skill/strategy [KNOWLEDGE], (4) confidence with
9 effectively using and demonstrating the SP skill/strategy [CONFIDENCE], (5) perceptions
10 of the effectiveness of the SP skill/strategy for improving an athlete's performance
11 [EFFECTIVENESS], (6) perceptions of how qualified they are to implement the specific SP
12 skill/strategy [SELF QUALIFICATION] and (7) perceptions of how qualified they believe
13 SCCs generally are with implementing the specific SP skill/strategy [COACHES
14 QUALIFICATION]. Participants rated each of the above on a 1 to 7 Likert-type scale (e.g.,
15 FAMILIARITY anchor points: 1 (not at all), 4 (moderately familiar), and 7 (very familiar);
16 FREQUENCY anchor points: 1 (not at all), 4 (moderately frequent), and 7 (very frequent)),
17 which aligns with response options used previously and provided informative anchors
18 without overly influencing participants with seven response options. Previous research with
19 athletic trainers, collegiate sport coaches, and licensed psychologists provided support for
20 the reliability and validity of the scores from this measure (33). This research included the
21 development of the measure following recommended scale development steps: qualitative
22 data inform item development, pilot testing of items (wording clarity, response option
23 appropriateness), and then data collection with different samples to test for differences in
24 scores based upon profession (i.e., athletic trainer, sport coach, licensed psychologist). For

1 example, licensed psychologists reported using hypnosis and self-talk significantly more
2 than sport coaches or athletic trainers, which aligned with licensed psychologists also
3 reporting significantly more training in hypnosis, imagery, and self-talk compared to the
4 sport coaches and athletic trainers (33). Further, the sport coaches reported receiving
5 significantly more training in time management and team building than the licensed
6 psychologists and athletic trainers. In the current study, all the perception and use of the SP
7 skills/strategies were reliably measured: attention, concentration, and mindfulness
8 (Cronbach's $\alpha = .84$); time management/organization ($\alpha = .85$); self-talk ($\alpha = .83$); goal-
9 setting ($\alpha = .87$); communication skills ($\alpha = .85$); imagery, visualization, and mental practice
10 ($\alpha = .83$); hypnosis ($\alpha = .89$); relaxation and energy management ($\alpha = .86$); and team
11 building ($\alpha = .84$).

12 **Subjects**

13 A total of 415 NCAA SCCs (19.7% return rate) participated in this study and
14 reported a mean age of 33 years ($SD = 8.6$ years). The majority of these SCCs self-
15 identified as male (83%) and White/Caucasian (86%). These participants described S&C as
16 their primary profession (88%), were highly educated ($MS = 75\%$; $PhD = 1\%$),
17 experienced (5-10 years = 35.4%; 10+ years = 39.9%), and Certified Strength and
18 Conditioning Specialist ($CSCS = 84\%$). These SCCs reported working primarily with
19 collegiate athletes (99%), although some also worked with semi-professional (3%),
20 professional (8%), national (8%) and Olympic (4%) athletes.

21 **Procedures**

22 After receiving Institution Review Board approval, NCAA SCCs were invited to
23 participate in this study. A list of 2100 NCAA SCCs was developed based upon the
24 information presented for that year's SCCs on each Athletic Department websites of

1 NCAA affiliated schools across the United States. A personalized email was sent to each
2 one of these coaches inviting them to participate in this study by completing an online
3 survey, hosted by a Qualtrics online platform (Qualtrics, Provo, UT). To protect subjects'
4 anonymity, subjects assented to participate in the study after reading the assent form that
5 included presenting the benefits and risks to the SCCs' participation. Therefore, coaches
6 did not provide their name during the assent or any other portion of the online survey to
7 ensure their survey responses could not be connected to them so that they would feel
8 comfortable providing honest answers to the questions throughout the survey. A four-phase
9 follow-up procedure was implemented, submitting reminder emails a total of 4 times in 1
10 week increment time periods, following best practice for online survey research (2).

11 **Statistical Analyses**

12 Analysis of the frequencies for each of the variables was conducted using SPSS 25
13 (IBM Corporation, Armonk, NY, USA). The variables met the assumptions for univariate
14 and multivariate normality, including skew and kurtosis for distribution normality. The
15 majority of the surveys (71%) were fully completed, however since there was missing data
16 present, multiple imputation with principal component analysis factors included as
17 informative auxiliaries (10) was conducted in the R program mice (32). The relative
18 efficiency values of .995-.997 support the success of the approach to handling missing data
19 employed with this dataset (13). The subsequent results are based upon the pooled results
20 from the analysis of the 100 imputed datasets in SPSS as an imputed data file to maximize
21 the quality of parameter estimates, power, and generalizability, while reducing bias (10).
22 The means, standard errors, and correlations were calculated, with adjustments made for
23 familywise Type 1 error rate (adjusted $\alpha \leq .001$). Finally, linear regressions were conducted
24 to examine how often SCCs reported using each SP skill and strategy was predicted by the

1 following five predictor variables: their level of perceived familiarity, knowledge,
2 demonstration confidence, effectiveness of the SP strategy, and their qualification to
3 implement the SP strategy. Bonferroni correction was used to adjust alpha level to .01 for
4 the regression coefficients to be significant.

5 RESULTS

6 **Descriptive results of the SCCs' use of and preparation to use SP Skills/Strategies**

7 The majority (59.9%) of these SCCs reported having less than moderate training in
8 SP. The majority (92.7%) of SCCs also reported a moderate to moderately high use of
9 many SP skills/strategies. The most frequent of these SP skills/strategies that SCCs
10 reported using were communication skills (M = 5.63, 95%CI [5.45, 5.81]), goal setting (M
11 = 5.24, 95%CI [5.02, 5.46]), and team building (M = 5.10, 95%CI [4.86, 5.34]). On the
12 other hand, the SP skills/strategies they used only moderately were self-talk (M = 4.04,
13 95%CI [3.84, 4.24]), energy management (M = 4.04, 95%CI [3.80, 4.28]), and imagery (M
14 = 4.15, 95%CI [3.91, 4.30]). On average, the SCCs' perceived SP skills/strategies to be
15 moderately effective [EFFECTIVENESS] (M = 4.93, 95%CI [4.81, 5.04]), and reported
16 moderate familiarity [FAMILIARITY] (M = 4.94, 95%CI [4.84, 5.03]) with SP
17 skills/strategies. Moreover, they perceived to have received moderate training (M = 4.16,
18 95%CI [4.06, 4.26]) and be moderately qualified to use SP skills/strategies personally (M =
19 4.28, 95%CI [4.18, 4.37]); plus, rated other SCC's qualification to use SP skills/strategies
20 as moderate (M = 4.06, 95%CI [3.94, 4.18]) (Table 1). *[Insert Table 1 Here]*

21 The following general patterns emerged between the frequency of using a SP skill
22 or strategy and the SCCs' self-reported preparation and qualification to use that skill or
23 strategy. The frequency that SCCs reported using six of the specific SP skills/strategies
24 [FREQUENCY] was significantly ($p \leq .005$) correlated with their overall level of SP

1 training [OVERALL SP TRAINING]: self-talk ($r = .18, p = .002$) and attention ($r = .21, p$
2 $< .001$). SCCs' overall level of SP training was not significantly correlated with their
3 frequency of use the following SP strategies: goal setting ($r = .13, p = .03$), imagery ($r =$
4 $.14, p = .02$), hypnosis ($r = .14, p = .01$), relaxation/energy management ($r = .15, p = .01$),
5 time management ($r = .08, p = .20$), communication ($r = .11, p = .07$), and team building (r
6 $= .06, p = .34$). SCCs' reported familiarity [FAMILIARITY] with specific SP
7 skills/strategies was significantly ($p \leq .001$) correlated with their use of the same SP
8 strategy [FREQUENCY] ($r = .16$ to $.48$; Table 2). The frequency [FREQUENCY] that
9 SCCs reported using specific SP skills/strategies was significantly correlated with their
10 self-perceived SP preparation [KNOWLEDGE] ($r = .19$ to $.61$) and confidence to use and
11 demonstrate [CONFIDENCE] the SP skill or strategy ($r = .24$ to $.54$). The SCCs'
12 perception of the effectiveness [EFFECTIVENESS] of specific SP strategies for
13 performance was significantly correlated with their frequency of using [FREQUENCY] the
14 specific SP strategies ($r = .19$ to $.36$), except for time management and imagery. The SCCs'
15 perceptions of their own qualification to implement SP skills/strategies [SELF
16 QUALIFICATION] to generally implement these SP strategies was significantly related to
17 how frequently they reported using the specific strategies [FREQUENCY] ($r = .21$ -.54).

18 *[Insert Table 2 Here]*

19 **SCCs' perceived training for SP skill competence and need for training for SP**
20 **skills/strategy competence**

21 The need for training in specific SP skills/strategies was asked of the SCCs. First,
22 the SCCs ranked the SP skills/strategies in order of training time necessary to be competent
23 with delivering the skills/strategies (Table 3). Hypnosis was ranked by 59.6% of the SCCs
24 as the SP skill needing the most training time to become competent utilizing, followed by

1 communication (17.7%), attentional control (14.9%), and team building (14.2%). When
2 asked about the importance of receiving additional training for the different SP
3 skills/strategies based upon their current, personal knowledge, SCCs perspectives varied
4 (see Table 4). For example, 23% of the SCCs ranked self-talk as the least important for
5 additional training, while 23.9% rated self-talk as the most important for additional
6 training. *[Insert Tables 3 & 4 Here]*

7 **Regression results predicting SCCs' use of SP skills/strategies by familiarity,**
8 **knowledge, confidence, effectiveness, and qualification**

9 Finally, to explore which of the factors were most predictive of SCCs' use of
10 specific SP skills/strategies, linear regressions were conducted. Each linear regression had
11 the frequency of using a specific SP skill/strategy [FREQUENCY] as the dependent
12 variable being predicted by five independent variables representing the SCCs' self-reported
13 perceived familiarity, knowledge, demonstration confidence, effectiveness, and their
14 qualification to implement the specific SP skill/strategy. As there were five predictors in
15 each regression model, Bonferroni correction of the alpha level (.05) resulted in
16 significance decisions for each predictor being based upon an alpha of .01. *[Insert Table 5*
17 *Here]*

18 All nine regressions were significant ($p < .001$), and accounted for a meaningful
19 amount of the frequency that the SP strategy was used by the SCCs (Table 5): self-talk
20 ($F(5, 209.55) = 15.609, R^2 = 37\%$), attentional control ($F(5, 146.03) = 13.732, R^2 = 47\%$),
21 time management ($F(5, 153.26) = 11.86, R^2 = 41\%$), goal setting ($F(5, 147.46) = 14.41, R^2$
22 $= 48\%$), communication ($F(5, 129.93) = 11.01, R^2 = 49\%$), imagery ($F(5, 147.50) =$
23 $10.168, R^2 = 40\%$), hypnosis ($F(5, 117.12) = 13.488, R^2 = 63\%$), energy management ($F(5,$
24 $119.11) = 9.97, R^2 = 54\%$), and team building ($F(5, 134.30) = 10.42, R^2 = 45\%$).

1 Familiarity was a significant ($p < .001$) predictor for all nine SP strategies. With the
2 exception of hypnosis, familiarity accounted for the most variance of the SP skill/strategy
3 frequency of use, ranging from 14% to 30%. Knowledge ($R^2 = 30\%$) accounted for more
4 hypnosis variance than familiarity ($R^2 = 20\%$). SCCs' knowledge significantly ($p < .01$)
5 predicted their use of all the SP strategies ($R^2 = 8 - 30\%$), except communication ($b = .11$,
6 $\Delta R^2 = 7\%$, $p = .02$). SCCs' confidence to demonstrate was the next most commonly
7 significant ($p \leq .01$) predictor of SCCs use of the SP strategies ($R^2 = 6 - 15\%$), except for
8 goal setting ($p = .02$) and energy management ($p = .02$). Although not significant at the .01
9 level, the SCCs' perception of the effectiveness of the SP skill/strategy accounted for a
10 meaningful amount of variance for six of the SP skills/strategies: self-talk ($\Delta R^2 = 4\%$),
11 attention control ($\Delta R^2 = 4\%$), time management ($\Delta R^2 = 4\%$), goal setting ($\Delta R^2 = 5\%$),
12 communication ($\Delta R^2 = 3\%$), and team building ($\Delta R^2 = 2\%$). The SCCs' self-perceived
13 qualification to implement the SP strategy also did not significantly predict SP strategy use;
14 however, SCCs' self-perceived qualification did account for meaningful variance of self-
15 talk ($\Delta R^2 = 2\%$) and imagery ($\Delta R^2 = 6\%$).

16 DISCUSSION

17 The aim of the current study was to provide a better understanding of SCCs'
18 perceptions and use of specific SP skills/strategies. SCCs in this study reported at least a
19 moderate use of particular SP strategies in their daily activities with their athletes. In the
20 current sample, the SP skills/strategies predominantly used were goal setting, self-talk, and
21 activation; meanwhile imagery and self-confidence were among the least used SP
22 skills/strategies. Furthermore, the SCCs differed in their opinion regarding the need for
23 additional education for how to implement different SP skills/strategies. This was
24 exemplified by their responses to the importance for training on how to utilize self-talk.

1 Finally, the most important predictors of NCAA SCCs' SP skill/strategy use was their
2 familiarity with and knowledge of the specific SP skill/strategy, followed by their
3 confidence to demonstrate the skill/strategy.

4 The most frequently used SP skills/strategies are similar to those found in previous
5 qualitative research (29). Athletes (20) and SCCs (29) have expressed that SCCs role
6 includes "psychology-oriented responsibilities" (29, pg 2853). Although reporting using SP
7 skills/strategies, the SCCs in the current study also reported receiving only moderate SP
8 training. This aligned with their perception of SCCs general qualification to demonstrate
9 and utilize SP skills/strategies as moderate.

10 Additionally, the findings of this study illustrate how SCCs levels of familiarity,
11 confidence, training, and, in most cases, perceived effectiveness, of specific SP
12 skills/strategies, play an important role in impacting SCCs' use of these skills/strategies.
13 These results echo those of Massey and Maneval (15), highlighting the importance of SP
14 knowledge, both applied and theoretical, to the educational curriculum of SCCs. For this
15 reason, it seems important to include SP-specific knowledge within the knowledge areas
16 identified as foundational to the training and professional practice of SCCs.

17 Our results align with results from interviews with SCCs, in which they described
18 using SP skills/strategies most often to assist in athlete performance by enhancing
19 confidence, as well as regulating arousal and improving skill acquisition (29). Previously,
20 SCCs also reported they primarily integrate teaching SP strategies into athletes' training
21 (29). Therefore, SP education for SCCs should include S&C specific examples and
22 integrated applications to optimize SCCs' likelihood of implementing SP strategies/skills
23 into their training sessions. Pope and colleagues (26) indicated how coaches already look
24 for SP-related information online and would be willing and interested in receiving online

1 training that is more structured and applied to S&C. Online SP educational interventions
2 have already shown success with sport coaches (24) and physiotherapist (7), in supporting
3 their integration of SP strategies in their daily professional activity. Thus, addressing
4 SCCs' desire for more specific education regarding SP skills/strategies with online
5 education modules may be an equally successful approach for SCCs (16, 18).

6 **Limitations.**

7 There are some limitations of this study, which are important to identify and use to
8 inform future research. First, this data was all self-report. Therefore, there may be reporting
9 bias, as well as a potential influence on reporting from a lack of knowledge regarding SP
10 skills/strategies for SCCs to accurately report on their use. It is recommended that future
11 research examine these points from a qualitative approach, as well as studies that
12 implement observational methods to learn how and why SCCs utilize different SP
13 skills/strategies. Further, athletes' perceptions of SCCs SP skills/utilization during training
14 would provide insight into how much the athletes are perceiving and retaining from the
15 SCCs in this area. In addition, this study focused on a specific subset of SCCs: the
16 collegiate SCC. SCCs may use different SP skills/strategies based upon athletes'
17 competitive level, experience, age, and development. Therefore, research with other
18 subpopulations is appropriate. Finally, there may be other important variables that affect
19 SCCs use of SP skills/strategies with their athletes, including the number of athletes per
20 training session and interaction between the SCC and athletes' gender.

21 PRACTICAL APPLICATION

22 Expert coaches have reported that the area they develop most as they progress
23 professionally is their knowledge of different SP strategies (3, 6, 12). To assist SCCs build
24 their knowledge and confidence implementing SP strategies/skills, in April 2019 the first

1 ever Psychology of Strength and Conditioning Special Issue was published in the Strength
2 and Conditioning Journal. This issue highlighted how to integrate sport psychology
3 strategies/skills into training sessions (11, 21, 31) and techniques to assist SCCs with their
4 athletes' emotional regulation (25). In addition to these S&C specific resources, the
5 Association for Applied Sport Psychology (<https://appliedsportpsych.org/>), European
6 Congress of Sport & Exercise Psychology (<http://www.fepsac.com/>), and American
7 Psychological Association (apa.org) provides a wide range of resources on important sport-
8 specific and general topics for strength and conditioning coaches. These resources can
9 assist current S&Cs build their ability to assist athletes in their exercise execution by
10 regulating arousal, improving concentration, confidence, as well as improve self-correction
11 through self-talk and imagery.

12 An encouraging development from the recent SCC job task analysis is the elevation
13 of Psychology of Sport and Exercise to a distinct content area; this means future SCCs
14 must receive formal instruction in sport and exercise psychology. This closes the gap
15 between practitioners' recognized responsibilities and what is being emphasized as
16 important by the leading organization in the S&C field. In 2030 NSCA will require
17 individuals to have a degree from a NSCA accredited program in order to take the CSCS
18 exam (23). Based upon the new job task analysis, the new curriculum requires at least as
19 much of an emphasis on SP as Sports Nutrition and Kinesiology/Biomechanics. This
20 highlights for current and future practitioners the recognition by the NSCA of how
21 important it is to understand and integrate SP skills/strategies (e.g., motivation, attention
22 and focus, and energy management) into S&C training sessions to achieve the maximum
23 benefits from the scientifically grounded program designed by the SCC.

REFERENCES

1. Arvinen-Barrow, M, Penny, G, Hemmings, B, Corr, S. UK chartered physiotherapists' personal experiences in using psychological interventions with injured athletes: an interpretative phenomenological analysis. *Psychol Sport Exerc* 11: 58-66, 2010.
2. Dillman, DA, Smyth, JD, Christian, LM. *Internet, phone, mail, and mixed-mode surveys: The tailored design method*. Hoboken, NJ: John Wiley, 2014.
3. Dorgo, S. Unfolding the practical knowledge of an expert strength and conditioning coach. *Int J Sports Sci Coach* 4: 17-30, 2009.
4. Duehring, MD, Feldmann, CR, Ebben, WP. Strength and conditioning practices of United States high school strength and conditioning coaches. *J Strength Cond Res* 23: 2188-2203, 2009.
5. Estep, MK. NCAA Division I athletic trainers' perceptions and use of psychological skills during injury rehabilitation. Master's thesis, University of Tennessee, Knoxville, 2013. Retrieved from: https://trace.tennessee.edu/utk_gradthesis/1614
6. Grant, MA, Dorgo, S. Developing expertise in strength and conditioning coaching. *Strength Cond J* 36: 9-15, 2014.
7. Heaney, CA, Walker, NC, Green, AJ, Rostron, CL. The impact of a sport psychology education intervention on physiotherapists. *Eur J Physiother* 19: 97-103, 2017.
8. Holloway, JB. Weight room psychology: Selected psychological aspects of physical strength and conditioning. *Strength Cond J* 16: 56-61, 1994.
9. Holloway, JB. Weight room psychology: Selected psychological aspects of physical strength and conditioning, Part 2. *Strength Cond J* 17: 52-60, 1995.
10. Howard, WJ, Rhemtulla, M, Little, TD. Using principal components as auxiliary variables in missing data estimation. *Multivar Behav Res* 50: 285-299, 2015.

11. Jeffreys, I. The warm-up: A behavioral solution to the challenge of initiating a long-term athletes development program. *Strength Cond J* 41: 52-56, 2019.
12. Jeffreys, I. The five minds of the modern strength and conditioning coach: The challenges for professional development. *Strength Cond J* 36: 2-8, 2014.
13. Jia, F, Moore, EWG, Kinai, R, Crowe, KS, et al. Planned missing data designs with small sample sizes: How small is too small?. *Int J Behav Dev* 38: 435-452, 2014.
14. Lee, HW, Magnusen, MJ, Cho, S. Strength coach-athlete compatibility: Roles of coaching behaviors and athlete gender. *Int J Appl Sports Sci* 25: 55-67, 2013.
15. Massey, CD, Maneval, M. A call to improve educational programs in strength and conditioning. *Strength Cond J* 36: 23-27, 2014.
16. Massey, CD, Vincent, J. A job analysis of major college female strength and conditioning coaches. *J Strength Cond Res* 27: 2000-2012, 2013.
17. Massey, CD, Schwind, JJ, Andrews, DC, Maneval, MW. An analysis of the job of strength and conditioning coach for football at the Division II level. *J Strength Cond Res* 23: 2493-2499, 2009.
18. Massey, CD, Vincent, J, Maneval, M. Job analysis of college Division IA football strength and conditioning coaches. *J Strength Cond Res* 18: 19-25, 2004.
19. Mellalieu S, Shearer D. Mental skills training in strength and conditioning. In: *The Psychology of Strength and Conditioning*. D Tod and D Lavelle, eds. Oxon, UK: Routledge, 2012. pp. 1-39.
20. Moore, EWG. Strength Training and Sport Psychology. In: *Oxford Research Encyclopedia of Psychology*. Braddick, O, ed. New York, NY: Oxford University Press, 2017. pp. 1-31.

21. Moore, EWG, Quartiroli, A, Zakrajsek, R, Eckenrod, M. Increasing collegiate strength and conditioning coaches' communication of training performance and process goals with athletes. *Strength Cond J* 41: 18-24, 2019
22. NSCA. NSCA Education Recognition Program Application: Undergraduate strength and conditioning program, Colorado Springs, 2016.
23. NSCA. NSCA Special Committee on Accreditation. The Council on accreditation of strength and conditioning education (CASCE). Professional standards and guidelines, Colorado Springs, 2019.
24. Olusoga, P, Maynard, I, Butt, J, and Hays, K. Coaching under pressure: mental skills training for sports coaches. *Sport Exerc Psychol Rev* 10: 31-44, 2014.
25. Peterson, G. Developing an awareness of emotion management strategies to support athlete success. *Strength Cond J* 41: 3-7, 2019.
26. Pope, JP, Stewart, NW, Law, B, Hall, CR, Gregg, MJ, Robertson, R. Knowledge Translation of Sport Psychology to Coaches: Coaches' Use of Online Resources. *Int J Sports Sci Coach* 10: 1055-1070, 2015.
27. Radcliffe, JN, Comfort, P, Fawcett, T. The perception of psychology and the frequency of psychological strategies used by strength and conditioning practitioners. *J Strength Cond Res* 27: 1136-1146, 2013.
28. Radcliffe, JN, Comfort, P, Fawcett, T. Barriers to the prescription of psychological strategies by strength and conditioning specialists. *J Strength Cond Res* 32: 1948-1959. 2018
29. Radcliffe, JN, Comfort, P, Fawcett, T. The perceived psychological responsibilities of a strength and conditioning coach. *J Strength Cond Res* 32: 2853-2862. 2018.

30. Sartore-Baldwin, ML. The professional experiences and work-related outcomes of male and female Division I strength and conditioning coaches. *J Strength Cond Res* 27: 831-838, 2013.
31. Smith, V. & Moore, E. W. G. Strategies to increase athletes' transformational leadership behaviors during strength and conditioning sessions. *Strength Cond J* 41: 31-37, 2019.
32. van Buuren, S., Groothuis-Oudshoorn, K. mice: Multivariate imputation by chained equations in R. *J Stat Softw* 45(3): 1-67, 2011.
33. Zizzi, SJ, Blom, LC, Watson, JC, Downey, VP, Geer, J. Establishing a hierarchy of psychological skills: coaches', athletic trainers', and psychologists' uses and perceptions of psychological skills training. *Athl Insight: The Online J Sport Psychol*, 11(2): pp.unpaginated, 2009. Retrieved from:
<http://www.athleticinsight.com/Vol11Iss2/Feature.htm>

STRENGTH AND CONDITIONING AND SPORT PSYCHOLOGY

Table 1. Means and Standard Errors for SCC’s reporting about use of SP Strategies

Sport Psychology Skills/Strategies		Self-Talk	Attention Control	Time Management	Goal Setting	Communication	Imagery	Hypnosis	Energy Management	Team Building
Familiarity	<i>M</i>	5.04	4.63	5.51	5.77	5.66	4.98	2.85	4.45	5.53
	95%CI	4.84, 5.24	4.41, 4.85	5.33, 5.69	5.59, 5.95	5.48, 5.84	4.76, 5.20	2.60, 3.10	4.20, 4.70	5.33, 5.73
	Cohen's <i>d</i>	0.63	0.34	1.04	1.46	1.22	0.55	-0.57	0.22	1.07
Frequency	<i>M</i>	4.04	4.33	4.95	5.24	5.63	4.15	1.93	4.04	5.10
	95%CI	3.84, 4.24	4.11, 4.55	4.71, 5.19	5.02, 5.46	5.45, 5.81	3.91, 4.30	1.71, 2.15	3.80, 4.28	4.86, 5.34
	Cohen's <i>d</i>	0.02	0.18	0.47	0.79	1.2	0.07	-1.51	0.02	0.56
Knowledge	<i>M</i>	3.74	3.98	4.76	5.07	5.11	4.13	2.02	3.89	4.73
	95%CI	3.54, 3.94	3.76, 4.20	4.52, 5.00	4.85, 5.29	4.91, 5.31	3.89, 4.37	1.80, 2.24	3.64, 4.14	4.48, 4.98
	Cohen's <i>d</i>	-0.14	-0.01	0.38	0.64	0.68	0.06	-1.38	-0.05	0.35
Confidence	<i>M</i>	4.25	4.21	5.16	5.4	5.45	4.34	1.98	4.02	5.07
	95%CI	4.03, 4.47	3.99, 4.43	4.94, 5.38	5.20, 5.60	5.29, 5.61	4.12, 4.56	1.78, 2.18	3.78, 4.26	4.85, 5.29
	Cohen's <i>d</i>	0.14	0.12	0.73	1	1.05	0.18	-1.5	0.01	0.57
Effectiveness	<i>M</i>	4.97	4.94	5.32	5.61	5.66	4.96	2.86	4.68	5.34
	95%CI	4.77, 5.17	4.70, 5.18	5.10, 5.54	5.43, 5.79	5.28, 5.84	4.74, 5.18	2.59, 3.13	4.43, 4.93	5.09, 5.59
	Cohen's <i>d</i>	0.53	0.46	0.80	1.08	1.26	0.47	-0.52	0.32	0.69
Own Qualification	<i>M</i>	3.8	4	4.8	5.34	5.29	4.23	2.04	4.05	4.93
	95%CI	3.60, 4.00	3.78, 4.22	4.60, 5.00	5.16, 5.52	5.11, 5.47	4.01, 4.45	1.82, 2.26	3.83, 4.27	4.71, 5.15
	Cohen's <i>d</i>	-0.12	0.00	0.45	0.96	0.99	0.14	-1.41	0.03	0.51
Other SCCs Qualification	<i>M</i>	3.62	3.82	4.49	5.03	4.93	4.01	2.1	3.76	4.79
	95%CI	3.42, 3.82	3.60, 4.04	4.29, 4.69	4.83, 5.23	4.73, 5.13	3.77, 4.25	1.86, 2.34	3.51, 4.01	4.55, 5.03
	Cohen's <i>d</i>	-0.24	-0.10	0.30	0.66	0.54	0.01	-1.02	-0.12	0.41

Note. Cohen’s *d* is calculated comparing the mean to the moderate response option (4.00). 95%CI [Lower Bound, Upper Bound].

Table 2. Correlations with 95% CI of Characteristics within each SP Strategy

	Fam.	Freq.	Know.	Conf.	Effect.	Self qual.	SCCs qual.		
Self-Talk	Familiarity		.31** [.20, .42]	.35** [.24, .46]	.29** [.18, .41]	.38** [.26, .49]	.37** [.27, .48]	.35** [.24, .45]	Time Management
	Frequency	.26** [.13, .37]		.46** [.35, .57]	.37** [.26, .48]	.01 [-.10, .12]	.49** [.39, .59]	.39** [.29, .50]	
	Knowledge	.31** [.19, .42]	.22** [.10, .35]		.39** [.28, .50]	.14** [.02, .25]	.39** [.28, .50]	.31** [.19, .42]	
	Confidence	.29** [.17, .41]	.39** [.27, .50]	.33** [.22, .45]		.29** [.18, .41]	.46** [.35, .57]	.30** [.18, .41]	
	Effectiveness	.24** [.13, .36]	.32** [.20, .44]	.24** [.13, .36]	.34** [.23, .46]		.23** [.12, .35]	.20** [.09, .31]	
	Self qual.	.28** [.16, .40]	.42** [.31, .52]	.42** [.30, .53]	.47** [.37, .57]	.41** [.31, .50]		.62** [.52, .70]	
	SCCs qual.	.32** [.21, .42]	.24** [.12, .35]	.24** [.12, .36]	.25** [.13, .37]	.09 [-.04, .22]	.39** [.26, .50]		
Attention Control	Familiarity		.35** [.23, .46]	.31** [.19, .42]	.39** [.29, .50]	.39** [.27, .50]	.30** [.19, .41]	.26** [.15, .37]	Communication
	Frequency	.48** [.37, .58]		.39** [.28, .50]	.44** [.33, .54]	.36** [.24, .47]	.40** [.29, .50]	.21** [.10, .32]	
	Knowledge	.24** [.12, .37]	.31** [.19, .43]		.43** [.32, .53]	.21** [.10, .32]	.42** [.32, .51]	.15** [.04, .26]	
	Confidence	.46** [.35, .57]	.33** [.20, .44]	.30** [.18, .42]		.25** [.14, .36]	.70** [.63, .77]	.32** [.21, .42]	
	Effectiveness	.19** [.07, .31]	.19** [.07, .31]	.20** [.07, .33]	.30** [.18, .41]		.21** [.10, .32]	.20** [.09, .31]	
	Self qual.	.26** [.14, .38]	.40** [.28, .51]	.51** [.41, .61]	.50** [.38, .61]	.28** [.16, .39]		.39** [.28, .49]	
	SCCs qual.	.32** [.21, .43]	.24** [.11, .36]	.26** [.14, .38]	.37** [.26, .49]	.18** [.06, .30]	.36** [.24, .48]		
Goal Setting	Familiarity		.16** [.04, .28]	.29** [.18, .40]	.27** [.15, .39]	.34** [.23, .45]	.30** [.18, .41]	.30** [.18, .41]	Team Building
	Frequency	.30** [.19, .42]		.32** [.20, .44]	.38** [.26, .50]	.29** [.17, .41]	.32** [.20, .44]	.33** [.20, .44]	
	Knowledge	.41** [.30, .51]	.23** [.12, .36]		.21** [.09, .33]	.14** [.02, .26]	.31** [.19, .42]	.31** [.19, .43]	
	Confidence	.46** [.35, .56]	.36** [.25, .47]	.36** [.25, .48]		.26** [.14, .38]	.69** [.60, .78]	.15** [.03, .27]	
	Effectiveness	.45** [.34, .56]	.36** [.24, .48]	.34** [.23, .45]	.42** [.31, .53]		.34** [.23, .45]	.34** [.22, .46]	
	Self qual.	.41** [.29, .52]	.40** [.29, .51]	.51** [.40, .60]	.48** [.36, .59]	.27** [.14, .39]		.21** [.09, .34]	
	SCCs qual.	.33** [.22, .44]	.46** [.36, .56]	.23** [.11, .35]	.38** [.26, .49]	.30** [.18, .42]	.28** [.16, .40]		
Imagery	Familiarity		.26** [.15, .38]	.35** [.23, .47]	.33** [.22, .44]	.33** [.22, .44]	.31** [.20, .42]	.23** [.10, .35]	Hypnosis
	Frequency	.29** [.17, .41]		.61** [.48, .72]	.54** [.41, .65]	.29** [.18, .40]	.58** [.46, .69]	.54** [.42, .65]	
	Knowledge	.31** [.20, .42]	.19** [.07, .31]		.58** [.47, .68]	.40** [.29, .51]	.60** [.48, .70]	.33** [.20, .45]	
	Confidence	.21** [.09, .33]	.24** [.12, .36]	.31** [.19, .43]		.36** [.25, .45]	.65** [.55, .74]	.33** [.21, .44]	
	Effectiveness	.18** [.06, .30]	.01 [-.11, .14]	.23** [.12, .35]	.49** [.39, .58]		.50** [.41, .58]	.28** [.16, .39]	
	Self qual.	.40** [.29, .49]	.46** [.36, .56]	.34** [.23, .45]	.44** [.33, .55]	.28** [.17, .38]		.56** [.46, .65]	
	SCCs qual.	.08 [-.04, .20]	.21** [.09, .33]	.23** [.10, .35]	.26** [.15, .38]	.14** [.01, .25]	.23** [.12, .35]		
Energy Management	Familiarity								
	Frequency	.39** [.28, .51]							
	Knowledge	.34** [.22, .45]	.34** [.22, .46]						
	Confidence	.45** [.34, .55]	.44** [.32, .55]	.42** [.31, .53]					
	Effectiveness	.27** [.15, .39]	.32** [.21, .43]	.04 [-.08, .16]	.23** [.12, .34]				
	Self qual.	.39** [.27, .49]	.29** [.17, .41]	.48** [.37, .58]	.45** [.34, .56]	.18** [.07, .30]			
	SCCs qual.	.20** [.08, .31]	.40** [.29, .51]	.11* [-.02, .23]	.22** [.11, .34]	.24** [.13, .36]	.31** [.19, .42]		

Note. *p ≤ .01 **p ≤ .001 95% Confidence Interval (CI) is provided within the brackets [Lower Bound, Upper Bound].

STRENGTH AND CONDITIONING AND SPORT PSYCHOLOGY

Table 3. Percentage representation of how SCCs ranked each SP skill in response to the question “**Rank order** the following skills from the least amount of training time needed (1) to be competent, to the most amount of training time needed (9) to be competent in using and demonstrating these skills with athletes.” (N = 415)

	Self Talk	Attention Control	Time Mngt	Goal Setting	Comm	Imagery	Hypnosis	Energy Mngt	Team Building
Least amount	24.9	7.3	17.4	27.8	12.5	15.8	26.8	10.7	16.5
2	13.4	10.2	12.3	12	8.5	7.4	1.6	10.4	12
3	9.7	10.5	13.2	12.3	11.8	7.2	2.1	5.2	6.9
4	9.3	12.3	13.2	7.4	10	5.7	1.1	8.9	9.7
5	11	11.2	10.3	7.4	11.6	9.9	3.6	9.6	10.1
6	10	12.6	7.7	7.3	8.1	11.4	1.2	10.8	9.3
7	5.1	11.3	8.2	6.9	11.3	15.7	0.4	15	7.5
8	5.9	9.7	6	5.2	8.6	19.5	2.7	19.2	13.8
Most amount	10.7	14.9	11.7	13.7	17.7	10.4	59.6	7.9	14.2

STRENGTH AND CONDITIONING AND SPORT PSYCHOLOGY

Table 4. Percentage representation of how SCCs ranked each SP skill in response to the question “If you had the opportunity to receive more training, which of these skills would you like the training to be focused on?” (N = 415)

	Self Talk	Attention Control	Time Mngt	Goal Setting	Comm	Imagery	Hypnosis	Energy Mngt	Team Building
Least important	23	12.3	22.8	21.4	21.4	20.5	53.9	20.5	22.6
2	9.7	13.9	8.5	9.3	5.2	6.6	2.3	9.9	8.7
3	10.6	6.7	9.2	7.7	7.3	6.3	2.6	5.8	5.4
4	8.7	6.5	7.1	8.9	9.3	7.1	2.3	7	4.7
5	6.9	7.7	8.1	8.7	8.5	5.7	2.6	7.2	7.3
6	5.5	7.8	8.6	7.1	7.3	8.7	0.5	7.8	6.4
7	7.3	8.8	6.8	5.8	8.6	10.5	1.7	5.4	6.4
8	4.5	7.9	6.6	7.7	6.8	8.5	1.4	11.3	7.7
Most important	23.9	28.4	22.4	23.5	25.8	26.1	32.7	25.2	30.8

Table 5. Significant predictors of the outcomes for each regression analysis

	Familiarity	Knowledge	Confidence	Effectiveness	Self Qual.
Self-Talk $F_{(5, 209.55)} = 15.609$ $R^2 = 37\%$	b = .06 [-.15, .26] $\Delta R^2 = 14\%$	b = .19 [.02, .37] $\Delta R^2 = 11\%$	b = .17 [-.05, .40] $\Delta R^2 = 6\%$	b = .21 [.03, .40] $\Delta R^2 = 4\%$	b = .19 [.00, .40] $\Delta R^2 = 2\%$
Attention Control $F_{(5, 146.03)} = 13.732$ $R^2 = 47\%$	b = .17 [-.07, .40] $\Delta R^2 = 24\%$	b = .20 [-.00, .41] $\Delta R^2 = 11\%$	b = .30 [.01, .59] $\Delta R^2 = 6\%$	b = .11 [-.09, .30] $\Delta R^2 = 4\%$	b = .12 [-.13, .37] $\Delta R^2 = 1\%$
Time Management $F_{(5, 153.26)} = 11.86$ $R^2 = 41\%$	b = .15 [-.11, .40] $\Delta R^2 = 24\%$	b = .17 [-.06, .40] $\Delta R^2 = 11\%$	b = .33 [.04, .61] $\Delta R^2 = 6\%$	b = .03 [-.19, .24] $\Delta R^2 = 4\%$	b = .17 [-.10, .44] $\Delta R^2 = 2\%$
Goal Setting $F_{(5, 147.46)} = 14.41$ $R^2 = 48\%$	b = .16 [.44, .85] $\Delta R^2 = 27\%$	b = .18 [.38, .82] $\Delta R^2 = 8\%$	b = .13 [.44, .87] $\Delta R^2 = 6\%$	b = .23 [.44, .82] $\Delta R^2 = 5\%$	b = .20 [.46, .81] $\Delta R^2 = 2\%$
Communication $F_{(5, 129.93)} = 11.01$ $R^2 = 49\%$	b = .20 [-.04, .43] $\Delta R^2 = 28\%$	b = .11 [-.08, .30] $\Delta R^2 = 7\%$	b = .31 [.05, .57] $\Delta R^2 = 11\%$	b = .16 [-.01, .34] $\Delta R^2 = 3\%$	b = .05 [-.20, .31] $\Delta R^2 = 1\%$
Imagery $F_{(5, 147.50)} = 10.168$ $R^2 = 40\%$	b = .10 [-.16, .35] $\Delta R^2 = 15\%$	b = .13 [-.13, .39] $\Delta R^2 = 10\%$	b = .22 [-.05, .50] $\Delta R^2 = 9\%$	b = -.01 [-.22, .20] $\Delta R^2 = 1\%$	b = .34 [.04, .64] $\Delta R^2 = 6\%$
Hypnosis $F_{(5, 117.12)} = 13.488$ $R^2 = 63\%$	b = .04 [-.10, .19] $\Delta R^2 = 20\%$	b = .25 [-.06, .55] $\Delta R^2 = 30\%$	b = .41 [.01, .81] $\Delta R^2 = 11\%$	b = .41 [-.11, .15] $\Delta R^2 = 1\%$	b = .41 [-.21, .47] $\Delta R^2 = 1\%$
Energy Management $F_{(5, 119.11)} = 9.97$ $R^2 = 54\%$	b = .20 [-.02, .43] $\Delta R^2 = 30\%$	b = .21 [.01, .42] $\Delta R^2 = 12\%$	b = .23 [-.11, .57] $\Delta R^2 = 8\%$	b = .05 [-.14, .24] $\Delta R^2 = 1\%$	b = .20 [-.10, .50] $\Delta R^2 = 2\%$
Team Building $F_{(5, 134.30)} = 10.42$ $R^2 = 45\%$	b = .08 [-.17, .32] $\Delta R^2 = 17\%$	b = .14 [-.08, .36] $\Delta R^2 = 10\%$	b = .43 [.11, .75] $\Delta R^2 = 15\%$	b = .11 [-.11, .32] $\Delta R^2 = 2\%$	b = .06 [-.25, .36] $\Delta R^2 = 1\%$

Note. All significant predictors based upon the F-test and/or ΔR^2 are bolded. Table includes the unstandardized regression coefficient and 95% CI [Lower Bound, Upper Bound].