



Modern expectations of the qualified strength and conditioning coach

A quantitative cross-sectional study on the factors
of collegiate strength and conditioning coaches.

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Abstract

Aim

The aim of this study was to examine current factors regarding strength and conditioning coaches at the collegiate level, furthermore to examine factors dependent on the level of sports.

1. What was the educational background of strength and conditioning coaches at the collegiate level?
2. What was the salary of strength and conditioning coaches at the collegiate level?
3. How much relevant work experience did strength and conditioning coaches have at the collegiate level?
4. What were the differences and similarities of strength and conditioning coaches' factors dependent on collegiate division?

Method

The method was a cross-sectional study applying a survey to examine the study's four previously mentioned issues. Coaches encompassing the inclusion criteria (e.g. seniority and professionalism) of the study were contacted for possible participation. The survey was sent to collegiate strength and conditioning coaches (n=225) whom were randomly chosen with equal amounts of potential samples from each division. The results were then analyzed using mode, mean, range and frequency.

Results

82 surveys were completed and returned (36 %). Three surveys were ineligible, therefore 79 surveys were used to produce the results. A Master's degree (67.09 %) and CSCS certification (81.01 %) were recognized as common attributes among collegiate strength and conditioning coaches. Salary and relevant experience answers were fairly spread throughout all divisions. Differences in certifications were found as the SCCC was cited in higher frequency among Division I coaches (52.63 %) than the two lower divisions (≤ 26.67 %).

Conclusions

Both a master's degree within a relevant field and a CSCS certification can be regarded as fundamental attributes of collegiate strength and conditioning coaches. Work experience and CSCCa certifications may be efficient predictors for salary and involvement in elite versus non-elite environments. The study's results will aid aspiring collegiate strength and conditioning coaches in career development as well as employers in hiring processes.

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Appendix 1 Litteratursökning

Appendix 2 Strength & Conditioning Coach Survey

Common Abbreviations

The following table summarizes the abbreviations used in this study.

Abbreviation	Full name
CSCCa	Collegiate Strength and Conditioning Association
CSCS	Certified Strength and Conditioning Specialist
MSCC	Master Strength & Conditioning Coach
NCAA	National Collegiate Athletic Association
NSCA	National Strength and Conditioning Association
SCCC	Strength and Conditioning Coach Certified
USAW	United States of America Weightlifting

1 Introduction

An athlete with high-level physical abilities has a high probability to excel in sporting performance (Suchomel, Nimphius & Stone 2016, pp. 1441-1442). This is more often due to the coaching of a strength and conditioning professional. Athletes that pursue excellence therefore need exceptional support. The theory on investment in human capital suggests that the value of workers is highly due to the schooling and amount of experience one has acquired (Becker 1962, pp. 10-26). Therefore, athletes with high ambitions should receive help from coaches with a high value. This study seeks to further the available research on factors regarding strength and conditioning coaches and the relation to the level of sports they coach through Becker's (1962, pp. 9-49) theory on investment in human capital.

As of now information regarding what attributes contribute to a strength and conditioning coach's value (Martinez 2004, p. 5; Szedlak et al 2015, pp. 977-979; Vescovi, Binkley & Kerksick 2004, p. 386), what can hinder coaches continuance (Bowman, Mazerolle & Goodman 2015, pp. 426-431) accompanied with the potential difference high-level strength and conditioning coaches can have relating to athletes (Carolan 2010, p 11; Enoksen et al 2013, p. 200) the clarification for relevant statistics are enhanced. There are furthermore uncertainties about the status of educational background of coaches in sports (Vescovi, Binkley, Kerksick 2004, p. 386), one being if the educational background is as sought after as relevant work experience. This needs to be clarified to enhance the skills of coaches and optimize athletes' possibility to develop in the most effective way possible. Furthermore, it will assist aspiring in career development as they decide which route they want to take and employers in deciding what they seek in potential candidates. Lastly, the study will serve as an update to professional strength and conditioning coaches' attributes.

1.1 Key concept definitions

This study contains subjects that can be regarded as vague. To minimize misunderstandings that possibly could occur when reading this study is therefore important. Definitions of these concepts have been implemented to create clarity throughout the study. The key concept definitions are as follows; educational background, relevant work experience and level of sports.

1.1.1 Educational background

The concept definition of educational background of strength and conditioning coaches being applied throughout this study will consist of the two following parts. One being the formal academic achievements in the form of institution-based degrees. This includes different stages from the lowest being “none” to the highest “Doctoral or professional degree” as this was displayed as the highest degree occurring in Martinez (2004, pp. 8-9) study and as it is the order of academic achievements in higher learning. However, only relevant education (e.g. physical education, exercise science, kinesiology, etc.) will be eligible as these are the ones contributing to the general knowledge of a strength and conditioning coach (Dooman, Titlebaum & DeMarco 1998, p. 31).

The second part, which is a non-ranked part, of the educational background is in regards to certifications. Once again only certifications relevant to strength and conditioning will be taken into consideration. Prominent certifications seen in previous studies (Dooman, Titlebaum & DeMarco 1998, pp. 31-32; Magnusen 2010, p. 1444; Martinez 2004, p. 8-9) were used but also less noted yet relevant certifications due to their specificity within strength and conditioning (see appendix 2 for full list).

1.1.2 Relevant work experience

Relevant work experience is defined in this study as work experience that may contribute to the coach’s overall skill and consists of two different aspects, specific work experiences and other work experiences. The amount of time a strength and conditioning coach has been active at the college level will determine the specific work experience one has obtained. Additionally, other work experiences that are similar to that of a collegiate strength and conditioning coach contributes to the concept of relevant work experience, which completes the two aspects of relevant work experience. While the latter is an example of non-specific skills being harnessed it still can be deemed relevant if one sees it as such. Therefore, it becomes a subjective decision of what constitutes as relevant work experience.

1.1.3 Level of sports

The level of sports definition derives from the determined divisions of the NCAA, governing body of college athletics, that has divided the “like-minded campuses” into three divisions

(NCAA 2016-11-02). Each division is a clear ranking of athletic performance, where Division I acts as the highest and Division III the lowest. Division I includes athletes who are highly competitive in the hopes of reaching the professional level or Olympics and receive athletic scholarships whereas Division III doesn't have any athletic scholarships to hand out to its athletes (NCAA 2016a, p. 1). Therefore, Division I can be regarded as elite-level athletics while the two other cannot be regarded as elite (Swann, Moran & Piggott 2015, pp. 10-13).

1.2 Background

In order to further understand the uncertainties regarding the components contributing to effective strength and conditioning coaching and the effects it may have for athletes, areas such as; education, personal skills and experience have been highlighted. To ensure athletic development while simultaneously minimizing the risk of injury a coach needs a thorough preparation. The understanding of strength and conditioning might in the beginning of an athlete's career be basic, but accompanied with the sport-specific development over the years an increased knowledge regarding strength and conditioning is needed to match the needs of the athlete. Therefore, during the early recreational years of one's athletic career a single coach with both sport-specific and strength and conditioning duties might be sufficient. However, approaching an elite environment (e.g. nationally top-ranked high school or top division collegiate athletics) within the sport a strength and conditioning coach with specific knowledge to improve the physical aspects of the athletes is recommended (Carolan 2010, p 11; Enoksen et al 2013, p. 200).

1.2.1 Education may be key as basis of knowledge

One measurable way to rate the specific knowledge of a strength and conditioning coach is by analyzing the educational background. This has been shown through tests done in a general area of knowledge where a participants possessing a master's degree resulted in a higher test scores than participants possessing a bachelor's degree (Peter et al 2015, pp. 7-9). The educational background therefore gives a good indication of a strength and conditioning coach's basic knowledge and is suggested as such by Martinez (2004, p. 5). However, statistics show that only 16 % of the students with a bachelor's degree decides to further their education (Coughlin et al 2016, p. 16), resulting in a relatively small group of those with higher learning available for athletes compared to those with a bachelor's degree. This is also

evident in the relating field of Athletic Training where only a small amount of students who graduate receive a master's degree (Cavallario & Van Lunen 2015, p. 762).

Furthermore, professional strength and conditioning coaches have recommended changes to the course work of university and college curricula regarding strength and conditioning programs. A greater need for classes such as sports psychology, teaching methodologies and oral communication skills was reported to further develop the education's impact on future coaches (Vescovi, Binkley, Kerksick 2004, p. 386). Thus, educational plans may be insufficient, possibly decreasing the practical value of an academic degree when working as a strength and conditioning coach (ibid, p. 386). Recognize that this is information gathered in 2004 and may not be as relevant today.

1.2.2 Inter-personal skills to convey the knowledge

It is important to understand that only regarding education as a deterrent is somewhat limiting as there are more factors to determine the overall skill of a coach. This includes but does not limit to feedback, trust, authenticity, motivation and inspiration (Szedlak et al 2015, pp. 977-979). Inter-personal skills become as important as technical knowledge since coaching is done by one or more coaches to at least one athlete but often several. Thus, providing an insight showing the impact coaches' inter-personal skills have on their athletes. A skilled technical coach with low quality inter-personal skills may very well result in an unmotivated athlete which in turn deflates the athlete's chance to develop and perform at a high level.

While a skilled technical coach with high quality inter-personal skills will most likely result in an athlete who excels in their athletic development due to a high motivation and autonomy based relationship between the coach and athlete (ibid, p. 979).

1.2.3 Experience indicates a greater overall skill

Experience is another area that could be considered when comparing coaches, nonetheless it is nearly impossible to rate the different experiences of coaches. Instead a generalization of the coach's relevant experiences can be made that all relevant experience contributes to a coach's bettering of her- or himself, referred to as "on-the-job training" by Becker (1962, pp. 10-25). What this results in is a rating not based on what kind of experience but on the duration, how much experience a coach has in years (Becker 1962, pp. 10-25).

Practical experience such as internships and assistantships are encouraged as an implementation to the existing curriculum to provide a more complete education (Vescovi, Binkley & Kerksick 2004, p. 386). Therefore, enhancing the significance of on-the-job training to one's value as strength and conditioning coach. This does not necessarily enhance a coach's knowledge but acts as an indicator to determine a coach's total value and in turn overall skill of a strength and conditioning coach.

1.2.4 Is high value essential?

A study by Bowman, Mazerolle and Goodman (2015, pp. 426-431) indicates that coaches active in the field of athletic development choose to end the pursuit of an athletic coaching career due to two primary causes. The two causes being a "decreased recognition of value" and "work-life imbalance". A specific issue was regarding the working hours which often tended to be too long and too late creating a conflict with one's personal-life. Another specific issue was a skill going unrecognized in terms of reciprocal salary, leaving coaches no choice but to leave the profession to provide a necessary salary for their family (Bowman, Mazerolle & Goodman 2015, pp. 428-429). The working hours for all levels of sports will be different than a regular weekday job, this is something that with all probability will not change and is difficult to regulate as an employee. However, the salary a coach receives for compensation of labor is highly relevant to influence. By emulating the strength and conditioning coaches that have higher earnings a "decreased recognition of value" is avoidable. At this moment very little is known concerning this subject and the backgrounds of the "successful" coaches is uncertain. Thus, it is important to increase available knowledge involving this matter so that coaches know the factors of high-value coaches.

1.3 Literature review

The literature review is intended to create an insight in relevant statistics for strength and conditioning coaches in the past and investigate which factors may be regarded as determining or non-determining for level of sports. The following factors have been reviewed; education, experience and salary. The existing literature regarding strength and conditioning coaches' attributes and their relation to the level of sports they are active at is at this point limited. There are however more studies surrounding strength and conditioning coaches at the elite level (Dooman, Titlebaum & DeMarco 1998, pp. 31-34; Durell, Pujol &

Barnes 2003, pp. 368-373; Magnusen 2010, pp. 1440–1450; Martinez 2004, pp. 5-18; Pullo 1992, pp. 55-62; Reverter-Masia et al 2008, pp. 431-441; Teichelman 1998, pp. 70-72). The subject is not one that seems thoroughly researched when searching scientific databases (e.g. Discovery, SportDiscus, etc.), resulting in a literature spread over decades and therefore primarily indicating and not confirming the current status. There may not either be studies researching the factors throughout a broader level of sports. Due to the lack of available high-quality scientific literature similar positions such as athletic trainers (Lindley 2012, pp. 79-86) and sport coaches (Wicker, Orłowski & Breuer 2016, pp. 204-220) have been examined to create a more accurate literature review as they both work in relevant settings and often on similar terms.

1.3.1 Education

Within research regarding elite-level strength and conditioning coaches' education is often one factor that is studied. As the education curriculums provided by colleges and universities around the world often includes relevant programs for aspiring strength and conditioning professionals this may have led to education being an emphasized area of research. At the elite level it is apparent that an institution-based degree is encouraged for aspiring strength and conditioning coaches (Dooman, Titlebaum & DeMarco 1998, p. 31; Durell, Pujol & Barnes 2003, p. 369; Martinez 2004, p. 8; Pullo 1992, p. 59; Reverter-Masia et al 2008, p. 436). Whereas it is not as necessary for sport coaches (Wicker, Orłowski & Breuer 2016), even though the population is somewhat different, the recent timeframe makes it somewhat contributing to the body of literature. Nonetheless, distinct evidence supporting that institution based education correlates to the level of sports is somewhat inexplicit at the moment.

Another area that may be regarded as a sub-category of education is certifications. Certifications are different proofs of knowledge and attest to a specific level of achievement. The most reoccurring certification mentioned for strength and conditioning coaches at all levels is the Certified Strength and Conditioning Specialist (Dooman, Titlebaum & DeMarco 1998, p. 32; Durell, Pujol & Barnes 2003, p. 369; Magnusen 2010, p. 1444; Martinez 2004, p. 8; Pullo 1992, p. 56), or often abbreviated CSCS, provided by the National Strength and Conditioning Association.

1.3.1.1 Institution-based learning

Overall strength and conditioning professionals have an institution-based degree when working at the collegiate level. Studies investigating the collegiate sub-levels within Division I showed that there were no significant differences between the academic degrees through the sub-levels (Martinez 2004, p. 8; Pullo 1992, p. 56). Several studies also indicate that a Master's degree is a recurrent degree among elite-level strength and conditioning coaches (Durell, Pujol & Barnes 2003, p. 369; Martinez 2004, p. 8; Pullo 1992, p. 62). However, as previously mentioned the found research is relatively old which as a result does not provide the current timeframes needed as the current situation is of now uncertain. A slightly more recently published Spanish study conducted on high-level sports found that there were correlations between the level of sports and education. The strength and conditioning coach of the higher level of sports had a significantly higher probability of possessing a relevant academic degree. This was however only evident in the less commercialized and less economically profitable sports (Reverter-Masia et al 2008, p. 436).

1.3.1.2 Certifications

Pullo's (1992, pp. 56) work indicated that the CSCS was prevalent and nearly half of Division I-A strength and conditioning coaches held the certification at the time. Another certification regularly mentioned on the elite level was the certification offered by USA Weightlifting (Dooman, Titlebaum & DeMarco 1998, p. 32; Durell, Pujol & Barnes 2003, p. 369; Martinez 2004, p. 8). These were also the recommendations at the time (Dooman, Titlebaum & DeMarco 1998, p. 33). By early to mid-2000s the CSCS status rose among strength and conditioning coaches, around 75 % of the coaches at an elite level possessed the certification at the time (Durell, Pujol & Barnes 2003, p. 369; Martinez 2004, p. 8). Thus, demonstrating the importance of the CSCS certification at the elite-level.

As the previously mentioned research only included coaches at the collegiate Division I level no significant differences were found between the sub-levels. However, a study from 2010 that included professional (NBA), NCAA Division I and Division II levels did find a mentionable difference between the groups that can be argued as elite (Professional & Division I) and the non-elite (Division II). The findings indicated that around 75 % of the strength and conditioning coaches of the two higher levels once again possessed a CSCS, while slightly less than 40 % of Division II coaches held the certification (Magnusen 2010, p.

1444). The study implies three things, one being that the occurrence of the CSCS may have plateaued among elite-level strength and conditioning coaches but this is uncertain as more recent studies were not found. The second, an indication that CSCS certification occurrence is equal among different elite levels. Third and final, CSCS certifications may be more prominent among strength and conditioning coaches at elite levels of sports than sub-elite levels of sports.

1.3.2 Experience

According to Dooman, Titlebaum and DeMarco (1998, p. 33):

One of the most important things a strength coach can possess is experience. [...] Working with a competent strength and conditioning professional who is already established in the field can create many opportunities and make one more marketable as a strength and conditioning professional.

This is also evident through the study by Pullo (1992, p. 62) and follow up study by Martinez (2004, p. 10) where results show that the average experience of college strength coaches active in Division I-A increased by two years (6.4 to 8.66). Furthermore, both studies clearly indicated that the highest level of sports also meant that the strength and conditioning coach had more experience as collegiate strength and conditioning coach (i.e. specific work experience). Other studies also reveal that experience is key as it is something elite coaches have a lot of, as the amount of years Division I coaches have been strength and conditioning coaches rose from an average of nine to ten years to a majority having more than ten years of strength and conditioning coaching experience (Durell, Pujol & Barnes 2003, p. 369; Teichelman 1998, p. 71). So far, these are all examples of specific experience and research confined to elite-level coaches.

Magnusen's (2010, p. 1444) study including elite and non-elite participants indicated that the coaches at a higher level of sports had more experience as full time strength and conditioning coaches (i.e. specific experience) than the coaches at lower level of sports. Thus, increasing the probability of specific experience being linked to a strength and conditioning coach being active at a higher level, it does not however suggest nor diminish that overall relevant experience might also be linked to the level of sports. No research has been found that incorporates all relevant experience as Becker's (1962, pp. 10-25) theory suggests is contributing to success.

1.3.3 Salary

Unlike educational and experience factors that have been examined the aspect of salary and level of sports has a significantly definitive link. Studies indicate that strength and conditioning coaches responsible for a higher level of sports also receive a higher annual salary. (Magnusen 2010, p. 1444; Martinez 2004, p. 14; Pullo 1992, p. 62; Teichelman 1998, p. 71) This was also evident in the nearby field of Athletic Training where trainers in highly competitive schools were greater compensated compared to the average collegiate trainer (Lindley 2012, p. 86).

Furthermore, there has been an increase in annual salary for strength and conditioning coaches since the two past decades. Pullo (1992, p. 56) noted an average annual salary of \$30,000-\$39,000 for Division I-A coaches. Martinez (2004, p. 8) later found the average to have risen to \$50,000-\$59,000 for the same population. This indicates an increase that with most certainty is relevant to strength and conditioning coaches of all levels as collegiate athletics has experienced a large overall financial increase the past decade (NCAA 2016c, 2016d, 2017e).

1.3.4 Literature Summary

There have been increases in every factor examined for collegiate strength and conditioning coaches since the early 1990s. Institution-based learning has only experienced small increases as the percentage of coaches possessing a master's degree has increased slightly (Martinez 2004, p. 15). Experience has also only had slight increases (Durell, Pujol & Barnes 2003, p. 369; Martinez 2004, p. 15; Pullo 1992, p. 62; Teichelman 1998, p. 71). Whereas there have been significantly higher increases concerning the aspects of certifications, specifically CSCS certification (Durell, Pujol & Barnes 2003, p. 369; Martinez 2004, p. 15; Pullo 1992, p. 62), and salary (Martinez 2004, p. 15; Pullo 1992, p. 62; Teichelman 1998, p. 71).

Table 1 displays the examined factors that seem to determine (and not determine) the level of sports a collegiate strength and conditioning coach is active at. The research that has been presented demonstrates that CSCS certifications are shown to have existed throughout all levels of sports but at a higher frequency at the elite levels (Magnusen 2010, p. 1444). Specific experience also seems to be linked to the level of sports, as a greater amount of specific experience resulted in working at a higher level of sports (Ibid, p. 1444). Salary has

the strongest connection out of the different aspects presented based upon the examined literature. The amount of salary has been shown to be positively related to the level of sports a strength and conditioning coach is active at. Strength and conditioning coaches possess formal education (Martinez 2004, p. 8; Pullo 1992, p. 62) but it does not seem to indicate what level of sports they are active at to a very high degree (Reverter-Masia et al 2008, p. 437). However, the probability is enhanced as a higher academic degree correlates to higher salary (Griffith & Guthrie 2008, p. 69), which in turn has been shown to have a strong link to the level of sports.

Table 1 - Determining and non-determining factors of levels of sports based on the examined literature.

Determining	Non-Determining
Experience	Formal Education
Salary	
Certifications	

1.4 Aim and research objectives

The aim of this study is to examine factors regarding strength and conditioning coaches at the collegiate level.

1. What is the educational background of strength and conditioning coaches at the collegiate level?
2. What is the salary of strength and conditioning coaches at the collegiate level?
3. How much relevant work experience do strength and conditioning coaches have at the collegiate level?
4. What are the differences and similarities of strength and conditioning coaches’ factors dependent on collegiate division?

1.5 Theoretical framework

The theoretical framework used in this study is based on Becker’s (1962, pp. 9-49) theory on investment of human capital which is originally in regards to economic structures and later explained in a relevant sport setting (Wicker, Orlowski & Breuer 2016, pp. 206-207). The theory was selected due to its major variables being applied in similar descriptive studies

(Martinez 2004, pp. 5-18; Pullo 1992, pp. 55-62) as well as it being applied in a sport setting effectively (Wicker, Orlowski & Breuer 2016, pp. 206-207). The framework will primarily apply to the two major variables affecting salary, by analyzing differences in salary dependent on relevant work experience and educational background. The theory suggests workers actively invest in themselves by participating in different acts of doing. The investments made then lead to varying labor earnings. An increased earning is the result of a large human capital. Thus, continuous efforts towards increasing human capital will result in an increase of earnings. In layman terms, what you give is what you get.

Wicker, Orlowski and Breuer (2016, pp. 206-207) provides further explanation on the theory's relevance to sport coaches by stating that on-the-job training is transferable to the amount of years spent working as a coach. This could however be seen as a limiting factor as coaching is multifaceted and relevant experience from relevant fields of profession can contribute to the enhancement of coaching skills. Only accounting for the years where "coach" is a part of the job title might therefore be limiting to a person's true on-the-job investments but may also lead to overestimating when assessing your own relevant work experience. In regard to "schooling" the researchers suggest academic degrees and certificates, once again related to the practice of sport coaching, to further accredit a coach's investment (Wicker, Orlowski & Breuer 2016, pp. 206-207). The four investment possibilities suggested by Becker cover four different areas; On-the-job, Schooling, Other knowledge and Productive wage increases.

1.5.1 On-the-job

The first area listed, "on the job", is also the area presented as the most important one when regarding earning outcomes. This area includes learning and harnessing skills through practical work experience. Becker (1962, p. 11) furthers the explanation and gives an example:

Many workers increase their productivity by learning new skills and perfecting old ones while on the job. For example, the apprentice usually learns a completely new skill while the intern develops skills acquired in medical school, and both are more productive afterward. On-the-job training, therefore is a process that raises future productivity and differs from school training in that an investment is made on the job rather than in an institution that specializes in teaching.

In a strength and conditioning coach setting this could for example involve an assistantship or practicing as an intern with a more experienced coach. Watching and practicing a training modality performed by the more experienced coach and then adding it to one's repertoire and thereby increasing human capital.

1.5.2 Schooling

Within this area investment in human capital is made by studying at schools, this being a formal way to acquire new skills. Becker (1962, p. 25) provides his definition of schools: "A school can be defined as an institution specializing in the production of training." This includes high schools, colleges, universities and other institutions fitting the description. Further investment in these areas therefore increases one's human capital, i.e. a higher academic achievement such as a doctorate degree results in a higher human capital than a bachelor degree.

1.5.3 Other knowledge

This area encompasses actions that raises one's command over resources. This for example could be a strength and conditioning coach examining one's market to better understand and realize where he or she would best fit. Allowing the coach to raise one's salary by being the best fit available. Another example would be a person who geographically searches for work based on the highest paying areas.

1.5.4 Productive wage increases

The fourth and last area of investment is concerning productivity, which can be manipulated in various ways to increase its potential. Health is one standout factor presented by Becker, he suggests improved health leads to improved productivity. This includes both emotional and physical health status. The author explains: "Firms can invest in the health of employees. [...] An investment in health that increased productivity to the same extent in many firms would be a general investment and would have the same effect as general training." (Becker 1962, p. 28)

2 Method

The study was done with a quantitative approach using a cross-sectional study design. The data collection was done using an internet-based survey provided by Netigate (Netigate AB, Stockholm, Sweden) which was sent to strength and conditioning coaches at the collegiate level. Universities and colleges in USA were focused on, due to previous comprehensive studies targeting the same population allowing for easier comparisons (Martinez 2004, pp. 5-18; Pullo 1992, pp. 55-62). This was necessary as it made it possible to reach coaches from different levels and areas in a short period. The use of collegiate athletics was due to the apparent differences in the divisions ranging from amateur to elite (NCAA 2016a, p. 1) and the size of the pool of potential candidates allowing for a relatively high number to be contacted compared to similar previous studies (Martinez 2004, p. 7; Pullo 1988, p. 56; Reverter-Masia et al 2008, p. 433; Teichelman 1998, p. 70).

2.1 Sampling

This study's population were active strength and conditioning coaches or held similar titles (e.g. performance coach) at a university or college in the USA during November 2016. An estimation of the total population amounted to 650 possible participants based on Magnusen's (2010, p. 1442) findings on strength coaches' occurrence at the lower collegiate level and the low occurrence at Division II and III when searching for listed strength and conditioning coaches for this study.

An inclusion criteria was established with several requirements where seniority was the most important one. To be eligible to participate one must have been listed at the official website of the respective school. Precedence was given to coaches listed as "head strength and conditioning coach" at the school website. By doing this it ensured that the coaches that had the most influence over the athletes' physical training were contacted as the work-title indicates. If there was no listed "head strength and conditioning coach", or of similar title indicating superiority, the first listed strength and conditioning coach with an available e-mail address was selected. Anyone listed as an intern or graduate assistant was illegible to participate in the study due to their position as a participant in a formal program to increase their experience and not as an employed professional. Participants in the pilot study were also viewed as illegible for the main study as they had already participated once.

To decide which strength and conditioning coaches that were going to be contacted a list of each collegiate division was used (NCAA 2016-11-02). Each school was given a numerical value according to their alphabetical order. The numbers were randomly sequenced through the services of Random.org (Randomness and Integrity Services Ltd., Dublin, Ireland), created by Dr. Mads Haahr, giving each school a designated number (Random.org 2017-02-22). This gave the selected schools an equal chance to be selected without any bias to the selection process which is evidently advantageous in research (Hong & Yoo 2013, p. 61). The randomized schools' websites were searched to find an eligible strength and conditioning coach. If there was not an eligible participant available or a listed e-mail address to the strength and conditioning coach the school was disregarded and the next school on the randomized sequence list was searched. This process was done once for every collegiate division until the final potential participant list was done (n=225) with an equal amount of coaches from each division (n=75). Thus, resulting in approximately 35 % of the available population being contacted for the survey.

2.2 Instrument

A survey was constructed to examine the status of strength and conditioning coaches at the collegiate level. Questions concerning collegiate level, experience, education and salary were used in the survey. There are a total of nine questions where question two is an eliminating question. All questions were compulsory except the last one being a follow-up question (see appendix 2 to see the full survey).

Questions regarding strength and conditioning coaches' education and work experience was inspired by a survey constructed by Vescovi, Binkley and Kerksick (2004, p. 387). While the questions regarding salary were interpreted from articles regarding salary questions in surveys (Duncan & Petersen 2001, pp. 248-263; Jansen et al 2011, 1957-1969). The survey also included an e-mail introduction expressing the aim of the study and the fact that all data will be confidential and participation was fully optional. Also, an e-mail address of the author for further questions was provided.

The questions were then configured to be appropriate for the designated population and was sent to the thesis supervisor for approval before the pilot study began. The pilot study consisted of a total of nine listed strength and conditioning coaches, where three coaches from

each division were contacted (response rate of 11%). The aim of the pilot study was to gather information of the coaches' thoughts regarding the survey. Participants were encouraged to give suggestions on ways to enhance the existing survey and its questions. A text box was located at the bottom of every question to allow the participants to comment their suggestions. The results from the pilot study indicated that certain answer options (e.g. salary and experience) were too low and were changed to meet the possible answers of the main study. An additional question regarding relevant work experience was also added. Thus, resulting in the final version of survey.

2.3 Data collection

The introduction e-mail was sent to all participants with a two-week possibility to complete the survey. At the beginning of week two the e-mail was then sent once more, encouraging those who had not yet answered to do so in order to increase the final number of completed responses. Lastly, the e-mail was sent out one last time to the remaining sample who had not answered. The survey-tool (Netigate, Netigate AB, Stockholm, Sweden) allowed for a time generating mass mailing, which made it possible to reach all possible participants simultaneously. A timer was set at morning time as this was believed to be the time where most sample subjects would likely go through their respective e-mails. The e-mail consisted of an introduction to the subject and the purpose of the survey, a link was also attached at the bottom giving the reader a choice to participate. All completed surveys' results automatically generated to Netigate (Netigate AB, Stockholm, Sweden), thereby giving real-time updates of the results and statistical figures.

2.4 Data analysis

Descriptive statistics were analyzed through both Netigate (Netigate AB, Stockholm, Sweden) and Excel 2013 (Microsoft Corporation, Redmond, Washington, USA). The data was first analyzed while including all collegiate strength and conditioning coaches. As mostly ordered categorical data was used, median, frequency, mode and range values were used to show the central tendency and measures of variability. Furthermore, the data was divided into three different between subject factors, these being the respective collegiate division the strength and conditioning coach was responsible for and also what can be regarded as level of sports. Distributing data among the level of sports was done by exporting the data from Netigate

(Netigate AB, Stockholm, Sweden), which automatically sub-categorized the data depending on the coaches' answer regarding collegiate division, to Excel 2013 (Microsoft Corporation, Redmond, Washington, USA). Thus, allowing for a simplistic way to analyze the differences and similarities between each division.

The collected data was also deductively analyzed through Becker's (1962) theory on human capital to examine the relationship between salary as a response variable while education (i.e. schooling) and relevant work experience acts as explanatory variables.

2.5 Validity

The overall validity of the study's method can be seen as fairly moderate. The validity of the method was highly in response to the questions presented in the survey. Other factors contributing to the overall validity were amount of study participants and population.

It should be noted that several other factors not presented in this study can help explain the current status of strength and conditioning coaches and relationships between the subject's variables. Both Pullo (1992, p. 62) and Martinez (2004, p. 14) have conducted far more extensive studies including factors like age, sex, ethnicity, athletic experience and more in attempts to establish holistic profiles of strength and conditioning coaches. Due to the lack of time and lack of resources, as this is a bachelor's thesis, general factors presented by Becker (1962, p. 9-49) have only been chosen to be examined. Thus, the results will not display the full picture, but merely an insight to a small part of the extensive knowledge that is needed to draw decisive conclusions.

2.5.1 Validity of survey

A majority of the questions were collected from similar studies' surveys and questionnaires or studies regarding survey questioning to ensure the validity of this study's survey. Although they were collected they were not strictly copied as minor changes had to be made to better apply to the circumstances. This allows for a potential misunderstanding when reading the questions as they are not exact to the previously used and validated questions and consequently lowering the validity.

Almost all questions were objective with a possibility for only one interpretation. However, one question regarding relevant experiences was highly subjective. Thus allowing for different interpretations and understandings from different individuals. An interview based method would have resulted in a deeper answering and excluded possible misinterpretations, but since this survey included a subjective question the validity of that question can be regarded as low and lowering the overall validity of the survey.

An examination of the first survey draft was made by the supervisor. This led to changes in both the introduction e-mail but also the survey content. In turn making the introduction further explain the aim of the study and thereby increasing the understanding of participants and increasing the validity. Further actions were taken to increase the validity of the survey by doing a pilot study. However, the response rate was low (11%) and therefore did not contribute greatly to the survey's validity. The pilot study did result in an expansion of certain questions which increased the validity of the survey slightly, but a higher response rate would have led to more information gathered and an increased validity.

2.5.2 Validity of sample and population

The sample size (n=225) created a possibility of higher validity than it would with a lower sample size. For this to be entirely accurate the response rate needs to be somewhat alike, as it is the amount of responses that determine how general the study's conclusions can be. Similar studies achieved a response rate, between 43-68 % (Durell, Pujol & Barnes 2003, p. 369; Magnusen 2010, p. 1442; Martinez 2004, p. 7; Teichelman 1998, p. 70). If similar response rates occurred for this study as well between 97-153 responses would be collected.

In short, if all available coaches were contacted and the response rate was high the validity would be high, if less than ten were contacted and all responded the validity would be low. Thus, this study's potential validity was fairly high with the sample size that was contacted.

The collegiate strength and conditioning coach population contributes to an increased validity. It does this by having a clear structure of hierarchy to the level of sports in the different collegiate divisions. Thereby the validity of comparing the results of the three divisions increases. Besides the apparent differences in level of sports the designated population further increases the validity of the method through being collegiate strength and conditioning coaches of seniority within their organization. The source was directly contacted and the

coaches with the most influence on the schools' athletes was contacted to provide as accurate answers as possible from those who impact the athletes' athletic development the greatest. Thus, increasing the overall validity of the applied method.

2.6 Reliability

As the selection process was done randomly, a repeat of the process should give a similar sample spread of the population (Berg & Latin 2004, pp. 70-71). However, there is still a slight risk that such a thing did not occur, resulting in an inaccurate depiction of the population as the sample was only around 35 % of the total estimated population. If it would be the case that the spread would be different another selection process could give results differing from the results of this study and in turn lowering the reliability of this study.

The timing of the data collection could also possibly have an effect on response rates and responses. The survey was sent out in November which is competition-season for many of the major sports at the collegiate level. This leads to a higher likelihood of dropouts as collegiate coaches are most certain to be busy during competition-season than for example the summer. Questions regarding salary are also most likely affected by the time period the survey is sent out. Annual salary is most effectively asked around the annual tax time in USA which is in April (Duncan & Petersen 2001, p. 5). Because of the specific timeframe this was not a reliable option and "salary previous month" was therefore chosen as most suitable. Furthermore, as this survey asks for the salary of a coach from the previous month, this might differ if asked during summer vacation as there are rules constricting the collegiate strength and conditioning coaches' work duties depending on responsibilities (NCAA 2016b, p. 1-21).

2.7 Ethical outlines

For this study the ethical outlines that have been taken into consideration are those presented by Vetenskapsrådet in the document *Forskningsetiska principer inom humanistisk-samhällsvetenskaplig forskning* (Vetenskapsrådet 2002, pp. 6-14). This being a document proclaiming conducts of ethics in Swedish scientific research.

Requirement of information (*informationskravet*) was introduced to the participants on the introduction, then once more when the link was opened before the survey had commenced.

By expressing the aim of the study, potential benefits of partaking in the survey, and rights to withdraw or simply not participate. An e-mail address to the author was also present to allow for any further questions regarding the study one might have. Requirement of consent (*samtyckeskravet*) was given, as previously mentioned, through expressing the rights to withdraw or not participate at two initial times. As questions regarding salary are often sensitive and can cause withdrawal (Duncan & Petersen 2001 p. 1) an option of “Do not wish to answer” was available to further consent concerning sensitive questions and retain as many participants as possible.

Requirement of confidentiality (*konfidentialitetskravet*) was expressed by using a blind survey response, in other words participants who completed were not revealed to the author. No names, telephone numbers nor similar contact information was used, only e-mails to send out introduction e-mails were used. As previously mentioned, the author’s e-mail address was present and allowed participants to contact the author if a copy of the finished study was requested. As a result, participants contacting the author exposed their completion of the survey, but they did it by their own will. However, a low amount of participants acted on the possibility. Requirement of usage (*nyttjandekravet*) was exercised by not using the contact information for anything else than scientific purposes.

3 Results

A total of 82 responses were collected during the two weeks, resulting in 36 % of the contacted participants responding. The participants consisted of 19 (23.17 %) Division I, 30 (36.59 %) Division II, and 33 (40.24 %) Division III coaches. Out of the 82 responses 3 respondents answered that strength and conditioning was not a part of their primary duties and therefore discontinuing their participation, resulting in a total of 79 fully completed surveys. Table 2 is a composite of the different factors investigated in this study. The results depict the most prominent attributes of each factor, furthermore range and median values will be acknowledged when applicable. Later the results of each factor will be examined in-depth with figures showing percentages of the accumulated responses.

Table 2 – A composite of factors regarding all strength and conditioning coaches at the collegiate level.

Factors among collegiate strength and conditioning coaches (n=79)			
Variable	Mode	Median	Range
Education	Master's degree	Master's degree	None – Master's degree
Certifications	CSCS (NSCA)	-	-
Specific work experience	2-4 years	5-6 years	Less than 2 years – More than 20 years
Contributing work experience	5-10 years	11-15 years	Less than 5 years – More than 30 years
Salary previous month	\$3,000-\$3,999	\$3,000-\$3,999	Less than \$1,000 – More than \$8,000

3.1 Education

The results indicate that a Master's degree is the highest and most frequent level of education obtained among collegiate strength and conditioning coaches. Only 3 participants responded that they did not possess any relevant academic degree, whereas 2 participants did not have any college or university education. No one reported that they had obtained a Doctoral or Professional degree (see figure 1 for complete percentages of the sample).

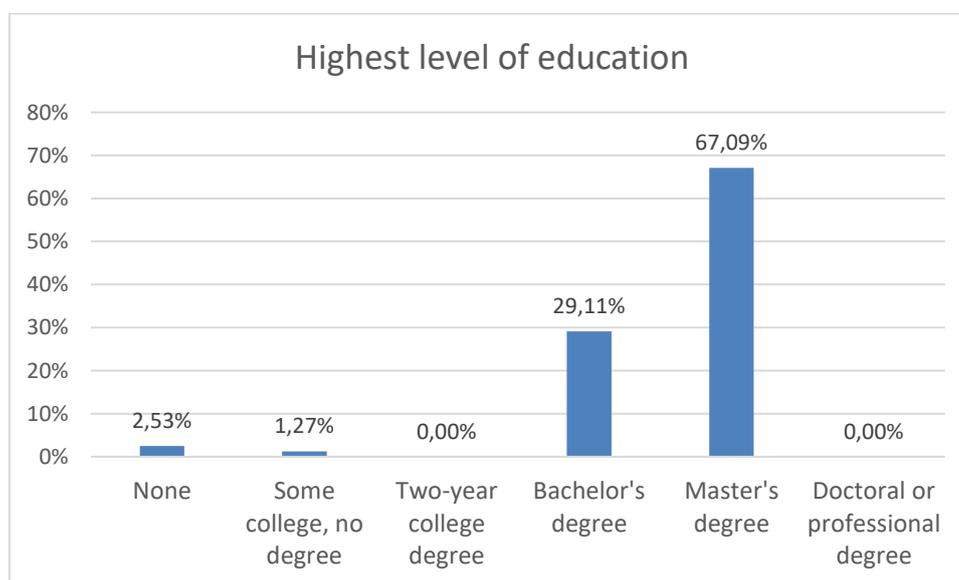


Figure 1 - Results of question regarding level of education.

The respondents listed NSCA's certification Certified Strength and Conditioning Specialist as the most common certification or diploma (81.01 %). Other frequent certifications were the Sport Performance Certification (39.24 %) and Strength and Conditioning Coach Certified

(26.58 %) provided by the USAW and respectively the CSCCa. 18 participants responded that they held certifications that were not listed as an alternative (see table 3 for full list).

Table 3 - Certification/Diplomas mentioned by respondents. (*= mentioned more than once)

Certifications and diplomas mentioned as “Other”	
<u>Organization</u>	<u>Certification</u>
ACE	PT
CFSC	Level 1
Dragon Door	RKC*
FMS	FMS Level 1*
NASE	CSS
NASM	CES*
NATA	ATC*
NCSA	CPT, RSCCD*, RSCC
NCSF	CPT
Precision Nutrition	Level 1
USATF	Level 1*
USAW	Level One Club Coach*
Westside Barbell	Special Strength Certificate

Out of the 79 participants two responded that they did not currently possess any certification or diploma. Figure 2 displays the results concerning certifications among all collegiate strength and conditioning coaches.

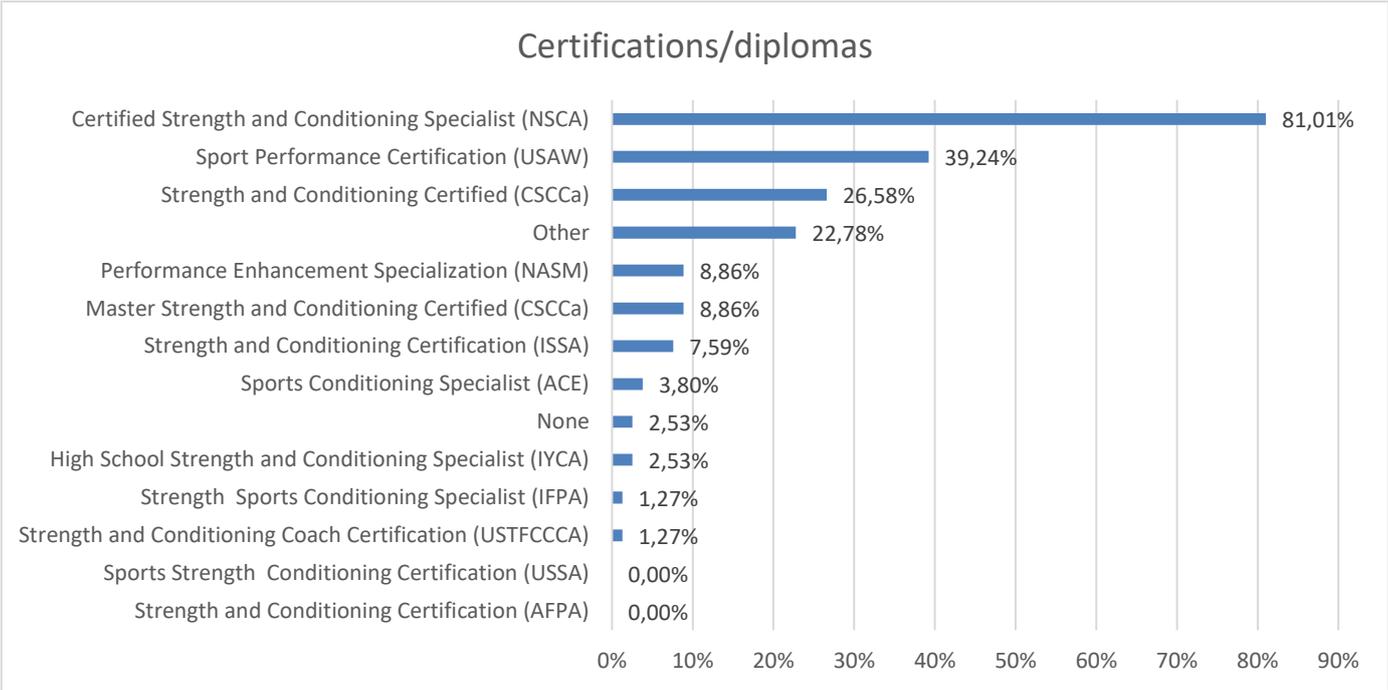


Figure 2 – Results of question regarding certifications among collegiate strength and conditioning coaches.

3.2 Salary

The question regarding one’s salary allowed for participants to bypass giving a value by responding “do not wish to answer”, a total of six participants chose to act on the presented choice, thus 73 coaches chose to answer the question. Nearly half of the sample (45.57 %) had an income the previous month amounting to \$3,000-\$4,999. Seven coaches (8.86 %) cited that their income was greater than \$6,000 the previous month, furthermore two of these coaches (2.53 %) reported that they earned more than \$8,000. An income less than \$1,000 the previous month was reported by three participants (see figure 5 for complete results).

Participants were also asked if the income amount included bonuses, overtime or similar extra salary enhancers. Nearly a fourth (24.05 %) of the sample answered that the amount expressed in the previous question regarding salary did not include all potential income enhancers. A large majority (84.21 %) of the 19 participants in question answered that less than \$100 was the amount of salary enhanced the previous month that was not accounted for on the question regarding salary. Additionally, answers included “\$100-\$299”, which two responded they had earned additionally through salary enhancers. As well as “\$300-\$500”, just as one participant responded.

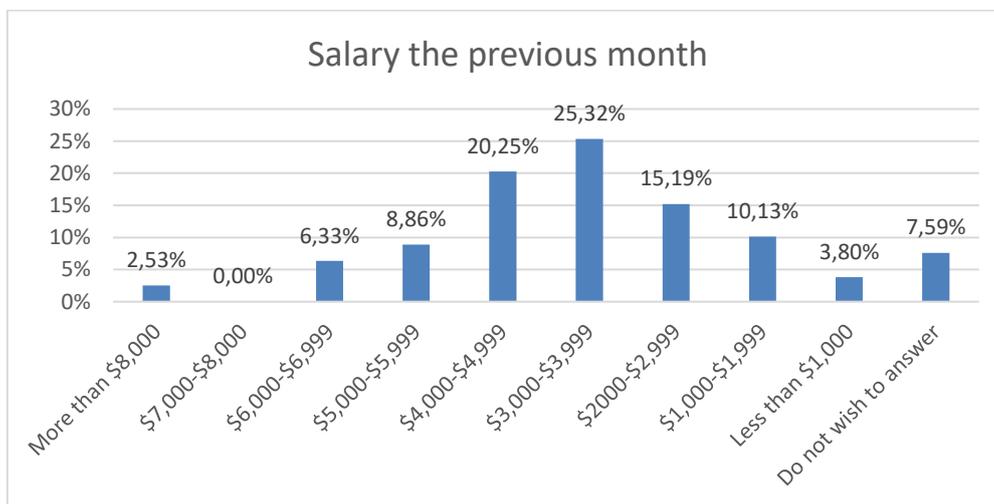


Figure 3 - Depicting previous monthly income as strength and conditioning coaching at the collegiate level, before taxes and other deductions.

3.3 Experience

The most prominent amount of years of specific experience (i.e. time as collegiate strength and conditioning coach) was between 2-4 years. The amount included time spent as graduate assistant and intern. The specific experience was moderately even among the sample, with only two participants replying that they had more than 20 years of collegiate strength and conditioning experience. Slightly more than half (51.90 %) of all participants had between 2-9 years of collegiate strength and conditioning experience (see figure 3 for complete results).

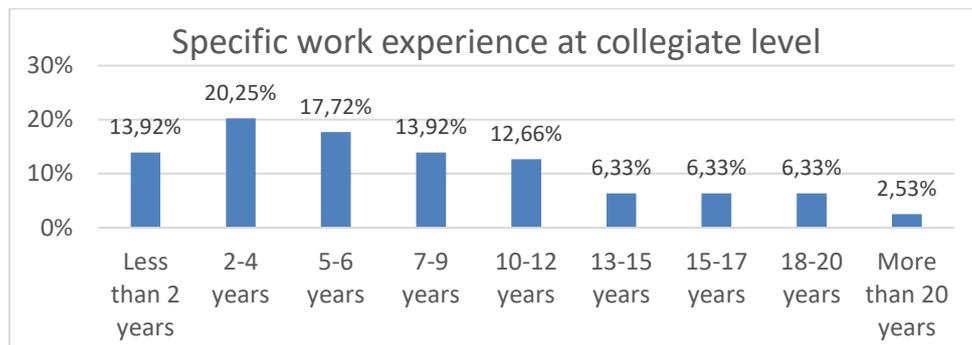


Figure 4 - Collegiate strength and conditioning coach experience.

Relevant work experience was also questioned which demanded participants to subjectively assess the amount of work experience contributing to their skill level as a strength and conditioning coach. Results revealed that the most common amount of years was between 5-10 years (37.97 %). Eight coaches responded that they had less than 5 years of relevant work experience equating to 10.13 % of the entire sample. Almost two thirds (63.29 %) answered that they either had 5-10 or 11-15 years of relevant experience contributing to their skill level as a strength and conditioning coach (see figure 4 for complete results regarding contributing work experience).

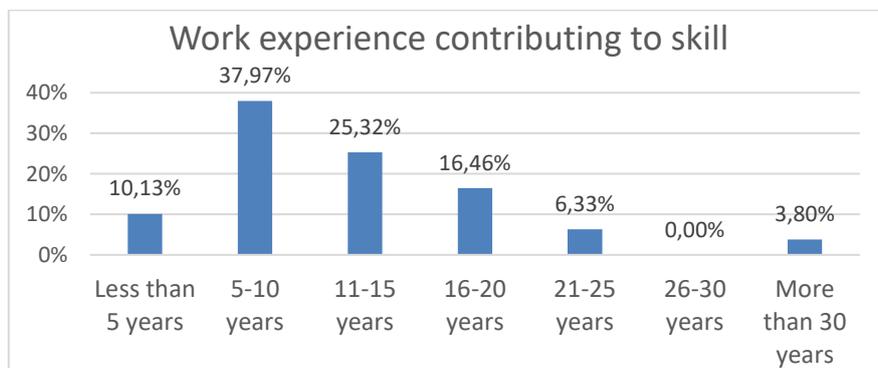


Figure 5 - Results regarding perceived contributing work experience, subjectively assessed and including work experience as collegiate coach.

3.4 Differences and similarities between the level of sports

The findings made in this study suggest that the attributes of collegiate strength and conditioning coaches are similar in nature. More notable are the similarities within formal education and prominence of CSCS certifications. Yet, there were specific areas where clear differences between the collegiate levels were apparent, such as specific work experience and the fact that the lowest interval ranges, irrespective of variable, were found to be highest among Division I strength and conditioning coaches. In table 4 these differences and similarities are summarized.

Table 4 - Comparison of strength and conditioning coach variables between the three collegiate divisions.
S.W.E. = Specific work experience, C.W.E. = Contributing work experience, S.P.M. = Salary of previous month

Inter-divisional variables of collegiate strength and conditioning coaches									
Variable	Division I (n=19)			Division II (n=30)			Division III (n=30)		
	Mode	Median	Range	Mode	Median	Range	Mode	Median	Range
Education	Master's degree	Master's degree	Some college, no degree - Master's degree	Master's degree	Master's degree	None – Master's degree	Master's degree	Master's degree	None – Master's degree
Certifications	CSCS	-	-	CSCS	-	-	CSCS	-	-
S.W.E (y)	18-20	10-12	2 - >20	<2	5-6	<2 - >20	2-4	5-6	<2 - 20
C.W.E. (y)	5-10 & 11-15	11-15	5-25	5-10	5-10	<5 - >30	5-10	5-10	<5 - >30
S.P.M. (\$)	4,000-4,999	4,000-4,999	2,000-6,999	3,000-3,999	3,000-3,999	<1,000- >8,000	3,000-3,999	3,000-3,999	<1,000-6,999

3.4.1 Educational differences and similarities

No remarkable differences were found among coaches possessing Master or Bachelor degrees as their highest level of relevant education. All Division I strength and conditioning coaches possessed some form of relevant college or university education, as the lowest level reported was “some college, no degree”. Whereas Division II and Division III consisted of 3.33 % of strength and conditioning coaches whom did not possess any relevant education of higher learning.

The CSCS certification was reported at high levels (>70 %) throughout all collegiate levels and at its highest at 90 % among Division III coaches. The Sport Performance Certification

provided by the USAW was also found to be at almost exact frequency throughout the divisions as it was held by around 40 % of the coaches of each division. Division I consisted of slightly more than half (52.63 %) of the coaches possessing the Strength and Conditioning Coach Certified certification, whereas Division II and III had lower values, around a fourth (26.67 %) of Division II and respectively a tenth (10.00 %) of all Division III strength and conditioning coaches. The Master Strength and Conditioning Certified certification, a higher level of the previously mentioned certification, also differentiated between the levels of sports. A fifth (21.05 %) of the Division I strength and conditioning coaches had obtained this certification, while a tenth (10.00 %) of Division II coaches and none of the Division III coaches had obtained the certification.

3.4.2 Experiential differences and similarities

The amount of years spent as collegiate strength and conditioning coaches was spread evenly from 2 to more than 20 years of specific work experience for the entire sample of Division I coaches. Whereas a majority (73.33 %) of Division II coaches were within the range of “less than 2 years” up to 9 years. Furthermore, almost two thirds (63.33 %) of Division III coaches responded that they had between “less than 2 years” up to 5-6 years of specific work experience. There were also differences within the three highest possible amount of years (15-17, 18-20, >20), almost a third (31.58 %) of Division I coaches answered within one of these intervals. For Division II the results were lower, two out of the responding 30 (6.66 %) answered within the three highest intervals. Four out of the 30 (13.33 %) Division III coaches responded that their specific work experience exceeded 15 years.

As for all contributing years of work experience the differences between the collegiate levels were lesser. More than half of all coaches irrespective of division had between 5-15 years of contributing work experience. None of the Division I strength and conditioning coaches had less than 5 years of contributing work experience, while Division II (16.67 %) and III (10.00 %) had several participants indicating their contributing work experience was less than 5 years. Furthermore, the two latter divisions also had coaches who had more than 30 years of contributing work experience. The highest answered interval for Division I was “21-25 years”.

3.4.3 Salary differences and similarities

All Division I coaches (n=19) decided to answer the question regarding salary compensation with an interval answer, whereas four Division II and two Division III coaches chose not to answer with an interval. Therefore, 26 and 28 coaches from Division II and III had answered the question. The salary earned the previous month was concentrated between \$2,000-\$6,999 for Division I coaches. The spread for both Division II and III samples was greater and more intervals were used to answer the question concerning salary. Division II had the highest salary compensation answer as two (7.69 %) coaches responded that they earned more than \$8,000 the previous month from collegiate duties as strength and conditioning. All Division I coaches had a salary of at least \$2,000, at the same time about a fifth of Division II (19.23 %) and Division III (21.43 %) earned a salary less than \$2,000 the previous month from collegiate strength and conditioning duties.

4 Discussion

The aim of this study was to examine current factors regarding strength and conditioning coaches at the collegiate level. The findings made in this study show that master degrees are common among all collegiate strength and conditioning coaches and the certification most prominent by far is the CSCS. In contrast, relevant work experience (i.e. specific and contributing) and salary each are spread out in terms of answer intervals. As a result relevant work experience and salary were shown to differentiate the greatest between the divisions, which led to somewhat clear differences between coaches active in elite versus non-elite environments. An emergence of the CSCCa acting as a deciding factor of level of sports and salary compensation was also apparent.

When the results of this study were compared to similar previously made studies (Durell, Pujol & Barnes 2003, pp. 368-373; Magnusen 2010, pp. 1440-1450; Martinez 2004, pp. 5-18; Pullo 1992, pp. 55-62; Teichelman 1998, pp 70-72) the following themes developed; master's degree is the norm, the CSCS is still the most important certification, CSCCa certifications have increased in occurrence, specific work experience has remained the same among Division I coaches. Many of the previous studies only included Division I coaches (Durell, Pujol & Barnes 2003, pp. 368-373; Martinez 2004, pp. 5-18; Pullo 1992, pp. 55-62; Teichelman 1998, pp 70-72), therefore a majority of the compared results have only regarded

Division I. Salary was described as “annual salary” in previous studies, as it was described as “previous month” no comparisons were drawn.

The level of formal education was as mentioned similar to previous studies which suggested that a master’s degree within a relevant field was the most prominent degree. Martinez (2004, p. 8) reported master’s degrees being cited by approximately 70 % of the Division I coaches which was similar to the results of this study. As this was the most recent study found examining the formal educational factor, the slight increase of coaches possessing master’s degrees seen in earlier works (ibid, p. 12) seems to have plateaued. On the other hand, CSCS certifications have increased among Division II coaches compared to the latest found statistics (Magnusen 2010, p. 1444). Furthermore SCCC certifications, provided by the CSCCa, among Division I strength and conditioning coaches have increased in frequency compared to the early 2000s (Martinez 2004, p. 8). This could be explained by the establishment of the CSCCa occurring the year 2000 (CSCCa 2016-12-13), as a result the organization has had time to grow over the years the past decade and gained recognition accordingly. Specific work experience revealed similar results for Division I coaches as seen in previous studies (Durell, Pujol & Barnes 2003, p. 369; Teichelman 1998, p. 71).

4.1 Greater specific experience may increase salary

Becker’s theory on human capital investment (1962, pp. 9-49) suggests that two major factors examined in this study, work experience and schooling, affect future income positively. Thus, a strength and conditioning coach who has a lot of relevant work experience and a high level of schooling (i.e. educational level) should have greater earnings than a colleague who does not possess the same amount of experience or level of schooling. It is also of necessity to comprehend that there are two more factors (e.g. other knowledge and productive wage increases) in Becker’s theory that have not been examined in this study and therefore the drawings from the theory should weigh lighter.

An indication of a positive relationship is present in the aspect of specific experience. Coaches with specific work experience in the bottom half of the spectrum (≤ 9 years) can be found more frequently in the lower salary incomes, and vice versa. An overwhelming majority (94.62 %) of coaches with nine or less years of specific work experience were also in the lower part ($\leq \$4,999$) income from the previous month. At the same time slightly more

than a third (35.71 %) of coaches with greater amounts of specific work experience (≥ 10 years) had an income in the higher end ($\geq \$5,000$). The possible relation is further clarified in figure 6, where it can be seen that coaches with a lot of experience increase in frequency as the salary intervals increase. There were two lesser experienced coaches who had a salary greater than all the coaches possessing greater amounts of specific work experience, however they only contributed to a very small degree (2.73 %) out of the entire sample.

The trend of more experienced coaches, in terms of years, having a greater salary was also apparent in the aspect of relevant work experience. Nearly a third of strength and conditioning coaches (30 %) with ≥ 16 years of relevant work experience had a salary of the higher intervals ($\geq \$5,000$). While only 15.38 % of coaches with ≤ 15 years responded they were in the higher salary intervals. Therefore, specific work experience seems to have a more relevant role in determining salary. As relevant work experience was subjectively determined the established amounts may not be fully accurate, which also needs to be taken in to account when evaluating “relevant work experience” as a factor.

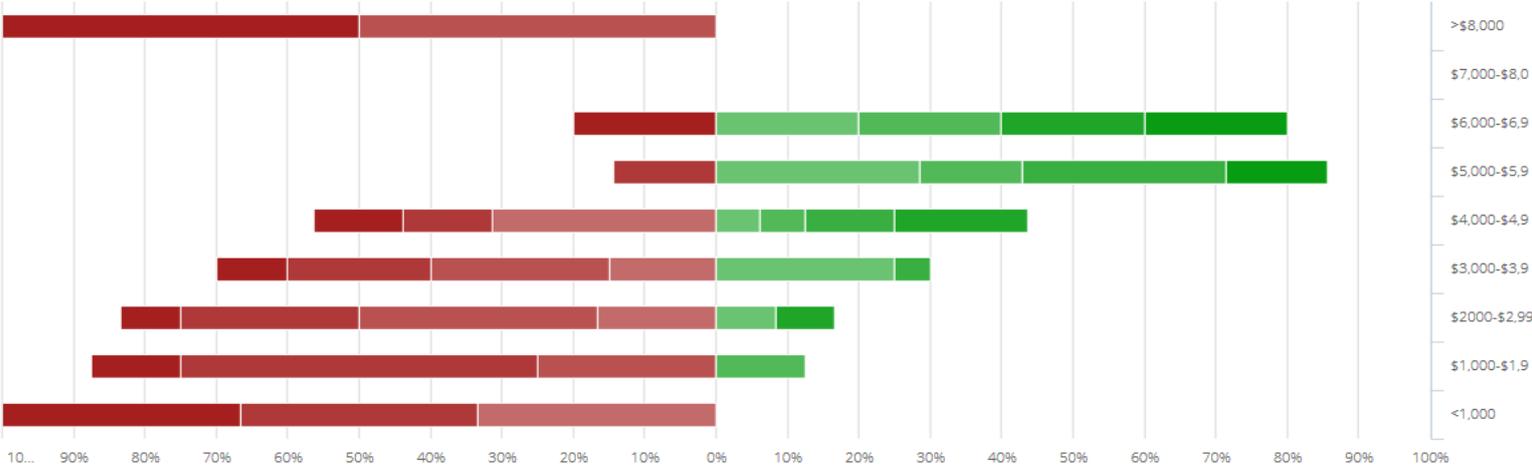


Figure 6 - Frequency (%) of salary dependent on specific work experience. Dark shades indicate lower/upper limit. Red = ≤ 9 years, Green = ≥ 10 years

Formal education did not equate to higher earnings when examining the results of this study. The salary median for both Bachelor and Master degree was the same at \$3,000-\$3,999, and frequency values within the educational categories were alike. Furthermore, participants with no collegiate education or “some college, no degree” both had higher median values than that of participants possessing a relevant academic degree. Therefore, higher formal education did not result in higher earnings as suggested by Becker (1962, pp. 25-26). Nonetheless, the

theory on human capital investment does imply that “on-the-job training” (i.e. work experience) is the most important factor which was also apparent in this study’s results.

4.2 Elite vs Non-Elite

The only division that can be regarded as “elite” in terms of sport performance among collegiate athletics is Division I. This assumption is justified due to the findings of Swann, Moran and Piggott (2015, pp. 6-7) as it is competition at the athletes highest possible level at the time, success within the division would add to the level of elite one would reach, sub-categories based on success of Division I was however not investigated in this study. Additionally, the justification is further enhanced as NCAA Division I is specifically mentioned as a category of elite-level sports (ibid, p. 7).

The strength and conditioning coaches responsible for elite collegiate athletics are superior to coaches responsible for non-elite athletics in amount of experience, as they have a higher amount of both contributing and specific work experience. Salary compensation was also slightly greater for coaches active in elite environments. Educational differences were not apparent in formal education, however CSCCa provided certifications (e.g. SCCC and MSCC) were however clearly more frequent for coaches active in elite environments (73.69 %) than coaches in non-elite environments (23.33 %). The amount of experience coaches possess might be a deciding factor of certifications provided by the CSCCa. This is due to the experiential requirements needed to complete the certifications, an internship or 12 years of full-time experience is needed for the SCCC (CSCCa 2016-12-12) and at least 12 years of full-time experience for the MSCC (CSCCa 2016-12-12). Therefore, an explanation might be that coaches responsible for elite collegiate athletics possess CSCCa certifications more frequently as they generally have more specific work experience.

4.3 CSCCa as the new parametric decider

The National Strength and Conditioning Association has provided strength and conditioning coaches with the CSCS since 1985 (NSCA 2016-12-12) and has seen a rise in the certification among elite-level strength and conditioning coaches since (Durell, Pujol & Barnes 2003, p. 369; Martinez 2004, p. 15; Pullo 1992, p. 62). A relatively clear distinction among the collegiate levels of sports was also apparent (Magnusen 2010, p. 1444). The results found in

this study furthered the increase among elite-level coaches, but also displayed that CSCS frequency is high among all collegiate levels (81.01 %). It may not therefore be regarded as a deciding factor of collegiate elite-level coaches, instead it can be regarded as a prerequisite of college strength and conditioning coaches of all levels as it's found nearly as frequently as formal academic degrees among the collegiate strength and conditioning coach population.

As suggested by Martinez more than a decade ago (2004, p. 13), “the CSCCa has made some headway”, and seemingly continues to do so at the elite level. Martinez reported that the SCCC was cited by a fourth of the Division I-A and Division I-AA (Martinez 2004, p. 8), it has also seen an increase in frequency as more than half of Division I coaches held the SCCC. More importantly, unlike the CSCS, a clear differentiation can be seen between the divisions in SCCC certifications held. Thus, it may be considered as a determining factor for coaches of elite versus non-elite collegiate athletics. If not yet, it seems to be heading towards a differentiating factor and should therefore not be overlooked by aspiring strength and conditioning professionals. Participants citing they had a certification from the CSCCa also had a higher frequency (82.61 %) of master degrees than those who did not (60.71 %). Additionally, both amount of relevant and contributing experience was greater among CSCCa certified coaches. Thus the basis of knowledge and skills learned from on-the-job training may be greater with individuals possessing a CSCCa certification and can thereby possibly be regarded as higher level strength and conditioning coaches.

The MSCC acts as the superior credential provided by the organization and is referred to as, “undoubtedly the highest honor that can be achieved as a strength & conditioning coach” by the CSCCa (2016-12-12). Consequently, they could be regarded as the highest level strength and conditioning coaches. This statement is strengthened as MSCC certified coaches had notably more specific work experience (M = 18-20 years), contributing work experience (M = 16-20 years) and percentage of master degree holders (85.71 %). No MSCC certified coach cited that they had less than 13-15 years of specific work experience and no less than 16-20 years of contributing work experience. The salary compensation was greater for MSCC certified coaches (M = \$4,000-\$4,999) than coaches not possessing the certification (M = \$3,000-3,999). Lastly, the lowest salary compensation received by a MSCC certified coach was \$4,000-\$4,999, meanwhile one third of coaches not possessing the MSCC with equal amount of specific work experience (≥ 13 years) earned less than \$4,000. Thus, aspiring strength and conditioning coaches should regard the CSCS as a necessary certification at any

collegiate level, for those coaches wanting to coach at the elite level a SCCC is desirable and finally if one wants to receive the greatest salary compensation the MSCC is the certification that may be sought after.

4.4 Strengths and limitations of the study

This study provokes new themes concerning collegiate strength and conditioning coaches by including all divisions and updating previous results, however primarily due to sample size the conclusions drawn from the results cannot be entirely generalized to the population. As the responding sample size only represented a small number amount of the population, the contacted sample size could have been greater to account for the low response rate (36 %) which would in turn result in a higher percentage of the population. The response rate was furthermore uneven through the collegiate divisions as Division I participants only accounted for 19 participants whereas the other two divisions had at least 10 more responding participants. A strength regarding the sample was the criteria set that had to be met for participation, allowing for the coaches most responsible for the athletes' fitness to be contacted to participate in the study.

The survey also had its strengths and weaknesses, in both questioning and content. One clear remark is that the pilot study did not produce a lot of results that contributed to the finalization of the survey. The survey was also lacking variables found in other studies (Martinez 2004, pp. 5-18; Pullo 1992, pp. 55-62), in turn this made the results of this study less comprehensive and difficult to compare fully to the previous studies. Salary indications should also be seen as somewhat limited, due to postseason salary bonuses contributing greatly to collegiate athletic staff members (Lindley 2012, p. 85). Thus, the true salary differences may be different in this study compared to one using annual salary and including postseason bonuses. The question regarding contributing work experience was one that had not been researched earlier which shined light on a variable that had not yet been investigated among collegiate strength and conditioning coaches and can therefore be regarded as a strength of this study. On the other hand, as it was fully subjective with little to none criteria it therefore limits the validity of the question's responses.

4.5 Implications

The results of this study have implications for several people surrounding the collegiate strength and conditioning coach, as well as the coach him/herself. Among the effected surrounding people there are athletes, athletic directors and to a lesser degree even institutions of higher learning and organizations providing relevant certifications. For the athletes being coached, it is relevant to be aware that a higher level of sports indicates that their strength and conditioning coach will possess the same amount of formal education but more relevant experience which possibly enhances the coach's skills. Athletic directors throughout the collegiate divisions can recognize what variables should be sought after when hiring, potential candidates should possess a bachelor's degree within a relevant field at the least and experience may be considered less important if present at a non-elite athletic division. Furthermore, athletic directors of Division I may seek candidates possessing a CSCCa certification.

Colleges and universities providing relevant programs should be highlighting master's educations as an apparent critical merit if one wishes to become a collegiate coach. Another perspective that may be taken into consideration are collaborations between schools and organizations, primarily the NSCA and CSCCa, doing this could enhance the amount of interest shown by considering future students. For organizations exclusivity and specificity seems to lead to recognition among collegiate strength and conditioning coaches. The CSCS prerequisites include a bachelor's degree (NSCA 2016-12-15) while the SCCC requires the same and additionally a specified amount of experience. (CSCCa 2016-12-12)

4.6 Recommendations

When studying the subject in the future it is important to include all collegiate divisions to examine potential similarities, differences and trends that might have occurred. It is also encouraged to subdivide the divisions, primarily Division I, this could provide further explanation of intra-collegiate differences. Suggested methods of sub-dividing are sport performance and geographical location as these have been observed to have an influence in a previous study (Teichelman 1998, p. 71). Longitudinal studies researching subjects through several years may also result in a more convincing indication of experience as key factor to

increasing salary. Thus, confirming the results of this study and the appliance of the theory of human capital investment (Becker 1962, pp. 9-49).

If a survey is the research instrument of choice it is recommended that an initial letter is sent to potential samples asking them if they would be willing to participate. If no, one could simply add potential samples to ensure a higher response rate than what occurred in this study. Expanding the window of survey responding could also potentially aid the issue of a low number of responses. Both of the survey recommendations noted so far would require significantly more time which was unavailable as this was a bachelor's thesis. However, recommendations regarding the variables used and comparativeness do not require any additional significant amount of time. A comprehensive profile similar to previous studies (Martinez 2004, p, 10; Pullo, 1992, p. 62) would result in a more extensive update of variables, furthermore it would provide comparable results to see changes over time. Another recommendation is to use variables in the same terms that have been used earlier (e.g. annual salary) to ease comparisons, one might also send the survey post-season to include potential bonuses which may reveal true earnings of collegiate athletic staff (Lindley 2012, p. 85).

5 Conclusions

Through the results found in this study the following six conclusions can be claimed and justified concerning collegiate strength and conditioning coaches:

1. A master's degree is the most relevant level of education among all divisions.
2. The CSCS certification can be viewed as a fundamental merit of collegiate strength and conditioning coaches.
3. Relevant work experience is greatest among coaches active in NCAA Division I athletics.
4. Greater amounts of specific work experience may lead to greater salary regardless of collegiate division.
5. The frequency of SCCC certifications are the most prominent designators of collegiate level of sports.
6. The MSCC is the most desirable certification for increasing collegiate strength and conditioning coaches' salaries.

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Appendix 1

Litteratursökning

Syfte och frågeställningar:

The aim of this study was to examine current factors regarding strength and conditioning coaches at the collegiate level, furthermore to examine factors dependent on the level of sports.

1. What was the educational background of strength and conditioning coaches at the collegiate level?
2. What was the salary of strength and conditioning coaches at the collegiate level?
3. How much relevant work experience did strength and conditioning coaches have at the collegiate level?
4. What were the differences and similarities of strength and conditioning coaches' factors dependent on collegiate division?

Vilka sökord har du använt?

Strength & conditioning coach, college, coach, education, salary, experience, collegiate, athletic trainer, sport coach, human capital

Var har du sökt?

SportDiscus, Google Scholar, Discovery

Sökningar som gav relevant resultat

Discovery: Strength & conditioning + college
Discovery: Strength & conditioning + factors
Discovery: Strength coaches
Discovery: "human capital" + sports

Kommentarer

Den forskning och den litteratur jag har använt har en hög relevans till ämnet men det var inte mycket och relativt ny forskning. Utöver egna sökningar har jag använt mig av källor från olika studier.

Appendix 2

Strength & Conditioning Survey

1. Which collegiate division does the school you are employed by currently compete in?

- Division I
- Division II
- Division III

2. My primary duties at the college/university I am employed at include strength & conditioning

- Yes
- No

3. How long have you been a college/university strength & conditioning coach?

This includes assistantships and internships

- Less than 2 years
- 2-4 years
- 5-6 years
- 7-9 years
- 10-12 years
- 13-15 years
- 15-17 years
- 18-20 years
- More than 20 years

4. How much work experience that contributes to your skill as a strength & conditioning coach do you have?

This includes both strength & conditioning positions at a collegiate level as well as jobs requiring similar skills

- Less than 5 years
- 5-10 years
- 11-15 years
- 16-20 years
- 21-25 years
- 26-30 years
- More than 30 years

5. What is your highest level education within a relevant field?

Relevant fields include; Physical Education, Exercise Science, Kinesiology, Athletic Training, Exercise Physiology, Biomechanics, etc.

- None
- Some college, no degree
- Two-year college degree
- Bachelor's degree
- Master's degree
- Doctoral or professional degree

6. Which of these certifications/diplomas do you currently possess?

Please select multiple if needed

- Certified Strength and Conditioning Specialist (NSCA)
- Strength and Conditioning Certification (ISSA)
- Strength and Conditioning Certified (CSCCa)
- Master Strength and Conditioning Certified (CSCCa)
- Sports Conditioning Specialist (ACE)
- Strength and Conditioning Certification (AFPA)
- Strength and Conditioning Coach Certification (USTFCCCA)
- Strength & Sports Conditioning Specialist (IFPA)
- Sports Strength & Conditioning Certification (USSA)
- High School Strength and Conditioning Specialist (IYCA)
- Performance Enhancement Specialization (NASM)
- Sport Performance Certification (USAW)
- None
- Other _____

7. What was your income as strength & conditioning coach at your college/university, before taxes and other deductions during the PREVIOUS MONTH?

- More than \$8,000
- \$7,000-\$8,000
- \$6,000-\$6,999
- \$5,000-\$5,999
- \$4,000-\$4,999
- \$3,000-\$3,999
- \$2000-\$2,999
- \$1,000-\$1,999
- Less than \$1,000
- Do not wish to answer

8. Does this amount include all tips, bonuses, overtime pay or commissions you may have received in the PREVIOUS MONTH?

Only from the college/university that you are employed at.

- Yes
- No

9. How much did you earn in tips, bonuses, overtime pay or commissions the PREVIOUS MONTH?

- Greater than \$500
- \$300-\$500
- \$100-\$299
- Less than \$100