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Article

Male and Female Perceptions of Supervision during Strength Training

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Abstract: A cross-sectional survey was distributed to 1322 members of a 1-on1 personalized strength training studio. 366 respondents (n=134 male and n=232 female), all aged over 20 years reported considerable training experience; 55% of males and 42% of females reporting 5+ years. Data were analyzed and reported descriptively with differences >5% identified based on use of the 5-point likert scale, sample size and nature of the observations. Disparity between males and females were identified; males reported higher perceptions of managing effort, technique, and programming without supervision compared to females. Safety was noted as being more important to females compared to males. Qualitatively, additional themes were raised including analogy of the personal relationship between trainer and trainee being similar to that of medical professionals. This was validated where participants discussed their adaptations from supervised strength training including quality of life in aging, and recovery from medical conditions and injury. Data is discussed in context of a previous body of literature suggesting males falsely report higher confidence in tasks compared to females, particularly in relation to effort, role models, and verbal encouragement. This research proves beneficial for strength training practitioners in enhancing their understanding and expectations of clients, as well as hopefully proving insightful in engaging more people in strength training.

Keywords: feedback; effort; technique; adherence

1. Introduction

A recent systematic review and meta-analysis highlighted the importance of supervision during strength training for favorable physiological adaptations [1]. However, the authors also discussed a lack of research in our understanding of the role of supervision as well as trainer and trainee perceptions. In reviewing the area, the authors highlighted key characteristics of supervision to be: technical coaching (correcting/maintaining client technique for exercise, providing feedback on performance), effort (increasing/maintaining sufficient effort level from the client to obtain desired adaptations), motivation (providing encouragement to complete a workout, to promote enjoyment, etc.), program design (designing training programs and workouts including exercise choice, load, progression, etc.), safety (spotting, technique correction to prevent injury, handing weights, etc.), and accountability (promoting adherence and engagement)[2]. In a subsequent survey of this topic completed by 468 trainers and trainees, summary points were: that technical coaching was perceived to be the most important characteristic of supervision, persons engaging in supervised strength training reported lower injury rates compared to those training unsupervised, and that females rated supervision more importantly than males [2]. Other comments from participants suggested sex differences in perceptions of supervision, as well as approaches to supervision, but since it was not the primary aim of the paper, conclusions were hesitant.

Participation rates for strength training remain overwhelmingly low, specifically for females (males = 18-35%, females = 14-26%) [3], with perceived complexity and difficulty often cited as barriers to engagement in resistance training [4]. However, while data suggests lower overall

engagement in strength training, studies have reported higher engagement in supervised strength training by females compared to males by both trainers (~40% female, 17% male), and trainees (~55% female, ~19% male) [2]. While strength training has an array of health benefits for males and females [5-6], it might be particularly important through a lifespan in females for hormone regulation [7], pregnancy [8-10], and bone mineral density during and after menopause [11-12]. However, to date there is no research which might explain the difference in engagement in supervised strength training.

A lack of transparency in previous research, and a need for greater detail of key elements which form the basis of supervision in future research have been suggested to improve our understanding [1,13]. Further, a greater understanding of differences in perceptions of supervision between males and females during strength training might positively impact adherence and allow trainers and clients to strengthen their relationship by aligning goals and expectations. With the above in mind the aim of this study was to attempt to better understand male and female perceptions of supervision during strength training.

2. Materials and Methods

2.1. Experimental Design

An online cross-sectional survey study was conducted between March and June 2024. The primary research aim was to compare the perceptions of supervision between males and females. This study received ethical approval from the Health, Exercise, and Sport Science (HESS) Ethics Committee at Solent University (fishj1HESS2022).

2.2. Sampling and Population

The survey was conducted in English and was distributed as a link via email to members of a 1-on-1 personalized strength training studio (Discover Strength). The email was sent to 1322 members of which 60% were female. The survey was completed by 366 participants (~28% response rate). The first page of the survey provided participants with an information sheet containing all details of the study and then required confirmation they understood this and provided informed consent to participate.

2.3. Survey

The survey was administered through JISC Online Surveys (Bristol, UK). Following informed consent, general demographic details were required; age, biological sex assigned at birth, number of years engaging in strength training, and primary reason for engaging in strength training. Participants were then guided through a series of questions around their perceptions of supervision during strength training, the full survey can be found at the following link: <https://osf.io/3x7yc>. The survey asked about general perceptions of importance of each characteristic (technical, effort, program design, motivational, accountability, and safety) using a 5-point likert scale (strongly disagree, disagree, neither agree nor disagree, agree, strongly agree). The survey then asked 5 questions pertaining to the impact of supervision for each specific characteristic. These questions were worded to be similar in form between each characteristic (see table 2 for questions). Finally, all participants were asked 9 additional questions about their perceptions of supervision on other characteristics (see table 3) and were then invited to leave any qualitative comments should they wish to.

2.4. Statistical Analyses

The primary research aim was to compare perceptions of the importance of supervision between males and females, from which data are reported as percentages of total respondents by group to accommodate variance in between group values (as descriptive statistics). Results have typically been reported based on the largest response theme (e.g., agree/strongly agree or disagree/strongly

disagree). Data has been discussed where differences >5% were identified within and between groups based on use of the 5-point likert scale, sample size and nature of the observations, although all data are available at <https://osf.io/tnd6x>. Qualitative content analysis was performed for questions that required an open text response [14]. Qualitative responses were assessed independently by three authors (JPF and MH) and grouped and coded based on the supervision characteristics identified in the body of literature (i.e., technical, effort, motivation, program design, accountability, and safety), or any other categories consistently identified.

3. Results

3.1. Demographic Data

The survey was distributed to 1322 members of which ~60% were female. There were 366 responses, of which 134 were male (36.6%) and 232 were female (63.4%). All participants were over the age of 20 years old, with 50.0% of males and 45% of females aged between 40 and 59 years, and 41% of males and 39% of females aged over 60 years. When asked after period of engagement in supervised resistance training, 10% of males and 19% of females reported <1 year, while 55% of males and 42% of females reported 5+ years. In reporting the primary reason for engaging in strength training, 53% of males and 47% of females reported health improvements, while 31% of males and 34% of females reported physical function other than sports performance. Participants' demographic data (age, sex, number of years training experience, and primary reason for engaging in resistance training) are presented in full in table 1.

Table 1. Participant demographics.

Question		Male (n=134; 36.6%)	Female (n=232; 63.4%)
Age (years)	20-29	4 (3%)	9 (4%)
	30-39	9 (7%)	27 (12%)
	40-49	41 (31%)	41 (18%)
	50-59	25 (19%)	64 (28%)
	60-69	41 (31%)	63 (27%)
	70+	14 (10%)	28 (12%)
Training Experience (years)	<1	13 (10%)	43 (19%)
	1-2	18 (13%)	16 (16%)
	2-3	16 (12%)	34 (15%)
	3-4	14 (10%)	19 (8%)
	5+	73 (55%)	120 (42%)
Primary reason for engaging in strength training	Sporting/athletic performance	8 (6%)	10 (4%)
	Health improvements	71 (53%)	109 (47%)
	Ill health avoidance	11 (8%)	33 (14%)
	Social reasons	0%	0%
	Aesthetics	2 (2%)	1 (<1%)
	Physical function	42 (31%)	79 (34%)

3.2. Quantitative Data

The next series of questions asked respondents to report their perception of the importance of each characteristic of supervision. Overriding responses were as follows: technical coaching = 90% of males and 97% of females responded very important or essential, effort-based coaching = 94% of

males and 91% of females responded very important or essential, program design = 90% of males and 91% of females responded very important or essential, motivation in the form of encouragement and enjoyment = 75% of males and 85% of females responded very important or essential, accountability = 79% of males and 75% of females responded very important or essential, and safety = 78% of males and 92% of females responded very important or essential.

Each characteristic then had a series of five specific questions. Overriding responses favored the importance of supervision, descriptive data and between group differences are presented in table 2. Where differences (>5%) were identified in the dominant response, a secondary response has been included. Finally, 9 uncategorized questions were asked about the impact of supervision upon other variables (e.g., reducing anxiety, improving confidence, feedback, etc.). Once again, data favored supervision for positive emotional perceptions, descriptive data and between group differences are presented in table 3. Again, where differences (>5%) were identified in the dominant response, a secondary response has been included.

INSERT TABLES 2 AND 3 AROUND HERE

3.3. Qualitative Data

Question 13 invited participants to, “share any other thoughts around supervised strength training”, using an open text box. Of the 366 participants who completed the survey, there were 120 (~33%; 37 male and 83 female) qualitative comments. Any comments which related solely to the survey itself were removed leaving 97 responses (29 male and 68 female). These were then coded independently by three authors (JPF and MH). The previously identified characteristics were consistently mentioned with varying degrees of frequency. All qualitative comments are available as supplementary material (<https://osf.io/rfxwb/>) however, in brief, accountability was identified most frequently (10 comments by males and 24 by females; some comments included long-term accountability, and using terms such as consistency and frequency), program design occurred next most frequently (6 males and 21 females; and comments often made reference to the knowledge/expertise of their trainer), motivation as a direct term was used by 2 males and 8 females, effort was identified 9 times (3 males and 6 females; comments included being “pushed to my limits” and “pushing past a comfort zone” by a personal trainer), technique occurred in 7 comments (all of which female; comments included the appreciation for “correcting technique”, “correcting my form”, and that “form is important” or that a trainer can “help me further improve my form”), finally safety was identified 3 times (2 males and 1 female; as well as commenting on “feeling safe”, one comment was that the client feels “like I’m not going to injure myself with supervision”).

In addition to the previously identified characteristics, several other themes occurred with a degree of frequency. The first of these was personal relationship (including comments of professionalism and confidence; 9 males and 20 females). These comments included the importance of “...[a] personal trainer that gets to know you and your goals”, that “it’s important they learn me. My strengths. My weaknesses. My needs. My personality”, as well as “attitude of the personal trainer”, and “personal relationship with the trainer is a significant factor”. Further terms including feeling cared for, or trainers being friendly. With regards to professionalism, clients stated, “The trainers have a superb work ethic and professionalism in addition to being extremely knowledgeable” and “The trainers are great. Professional, friendly and really motivating”. One male and one female participant both used the term confidence stating, “Having a trainer brings a level of confidence when working out” and “Work[ing] with a trainer on a consistent basis builds my trust and confidence”, respectively. These subthemes (professionalism and confidence) were grouped together because it was felt they were indicative of the trainer themselves, their attitude or approach to a client. A number of comments in the same theme identified that they didn’t like switching between trainers because they value the personal relationship “I think it’s really important for the trainer to know you”, “I like the continuity of having the same trainer rather than, as is often the case, getting a rotation of different and new trainers”, “Having too many trainers to have to work with is difficult as I need to train them on how to train me”, and “Benefits can be very trainer specific ... some trainers don’t realize that different clients need to be motivated/pushed to different extents

- one size does not fit all". The theme of personal relationships and professionalism is perhaps embodied best where a participant commented "I have become very attached to certain trainers just like a dentist or doctor."

The final theme identified related to adaptations from strength training (4 males and 19 females). Many participants referred to the benefits of strength training with respect to aging "...the value it [strength training] has for me mentally and physically today but also as I age", other comments identified the benefits of combatting ill-health "Strength training kept me strong during 9 months of cancer treatment now 5 years ago, and I continue to make progress in building strength at age 68", and "I gained even more appreciation for supervised training after my 2022 stroke", recovery from injury: "I have healed multiple injuries through strength training with supervision", and quality of life "As a 75-year-old male, I strongly believe that without regular strength training, my quality of life would not be what it is today".

4. Discussion

The results from the present study highlight disparities and similarities in the perceptions of supervision, and characteristics thereof, during strength training between males and females. In general, all data supported favorable responses towards supervision during strength training. This is as expected by a group of people presently paying for supervised strength training. While it is fair to argue that the population group considered see the importance of supervision and so engage in it, there is also the possibility of a confirmation bias – i.e., that because they pay for supervised strength training, they are more likely to report favorably for its importance. It is also worth highlighting the participant demographics as 45-50% of males and females were aged between 40 and 59 years, and ~40% of males and females were aged over 60 years. The seniority of this demographic supports the possibility for greater training experience (e.g., 42-55% of participants had >5 years), as well as the primary reasons for engaging in strength training; ~50% of males and females reported "health improvements", while ~30% of males and females reported "physical function other than sports performance". Finally, this demographic is more likely to have a disposable income which can afford supervised strength training.

The initial questions which asked simply about the importance of each characteristic in supervision produced some interesting data. Between group responses suggest that males place less importance on supervision for technical coaching, motivation for enjoyment, and safety compared to females. Disparity in the importance of these characteristics is also identifiable in subsequent questions for each specific characteristic. For example, when responding to "My technique would always be good even without supervision", a greater number of females compared to males disagreed or strongly disagreed. Presented another way, a larger number of males seemed more confident that they could maintain good technique without supervision. It's worth recognizing that the dominant response by males still favored that they disagreed that they could not maintain good technique (i.e., only 17% of males agreed the statement), but that there was a lower percentage of participants giving this response (see question 6.2, table 2). Further, when answering "I would feel confident to track and program my own workouts without a PT", a larger number of females compared to males disagreed. Thus, a larger number of males compared to females (19% vs. 6%, respectively) agreed that they could track and program their own workouts (see question 8.2, table 2). Finally, when responding to "My effort level would always be high even without supervision", males typically reported higher in agreement (and lower in disagreement) compared to females. This suggests that a greater number of male respondents perceive that they can maintain a similarly high effort level without supervision. In support, when responding to "I dislike it when my PT pushes me too hard", a greater number of males disagreed with this statement compared to females. We deliberately chose the phrasing "too hard" as something that all could (or should) identify as an extreme beyond an acceptable range (e.g., too hot, or too cold). However, the data suggests that females might be more likely not to want to work outside of extreme effort levels, whereas that males perceive effort as more important and manageable independently as well as in extreme (see questions 7.2 and 7.4, table 2).

This confidence might relate to the larger number of males reporting greater strength training experience (e.g., 65% of males compared to 50% of females had 3 or more years training experience, see table 1). However, a body of literature suggests a disparity in self-confidence between male and females. It is well documented that males have higher self-confidence levels compared to females in various parameters including education [15], employment [16], and physical activity and motor control [17]. Indeed, Dweck et al. [18-19] discuss that this confidence might arise from school years, where positive feedback in the classroom might encourage females to be enthused to attain this praise and less likely to take risks and make mistakes – weakening confidence. In contrast, males of the same age (who typically have lower attention spans, less advanced verbal and fine motor skills, and lesser social adeptness) typically receive feedback based on effort (or a lack thereof). This might fuel them to perceive that performance in a task is not outside their ability only dependent upon their application – something echoed herein in responses to effort, programming, and exercise technique. In a further study, reviewing educational pursuits, authors reported that males are often more influenced by positive male role models, whereas females appeared to benefit from verbal encouragement and contextualization [20]. In an exercise environment males might present confidence in their abilities based on their experience of males depicted in social media, or other forms as role models, whereas females might be less confident in general but also attain confidence by the verbal encouragement of personal trainers themselves. Further, Corbin, et al. [21] suggested that confidence disparity between males and females was not trait, but state specific. They continued, using the term “*situationally vulnerable*”, i.e., lacking confidence in specific environments. Certainly, the exercise industry might be historically thought of as male dominated; a meta-analysis considering self-confidence in physical activity reported an effect size of 0.40 in favor of greater self-confidence in males compared to females [22]. Even in younger children, perceptions of tasks requiring strength, speed, and power are characterized as male activities (by both males and females) with confidence in successful performance higher in males compared to females [23]. Furthermore, our data showing males having greater confidence in their capacity to train without supervision is supported by a previous survey where people participating in regular strength training suggested that a primary reason for non-engagement in supervision was a perception that their knowledge and experience was sufficient not to warrant a trainer [1]. In addition, data has previously reported a near 27:1 ratio of males to females in a free-weight section of a gym [24] which, while potentially indicative of low participation in strength training by females, might also be indicative of a lack of knowledge and/or confidence in strength training with free weights.

In contrast to males reporting greater importance and possibly autonomy in effort, technique, and program design, males typically seemed not to rate safety with the same importance as females. A greater number of females (i) disagreed that their workouts would be equally safe without supervision, (ii) agreed that they valued the safety of having a personal trainer present for their workouts, and (iii) agreed that the safety of their strength training is impactful in their ability to meet their goals (questions 11.2, 11.3, and 11.5, table 2) compared to males. Although, this was due to a larger number of males responding “*neither agree nor disagree*” rather than answering with an opposing view.

Our final group of questions were exploratory in nature rather than themed around the previously identified characteristics. While some of these questions were very general in nature (e.g., “*Supervision by a personal trainer optimizes strength training adaptations*”) others posed questions relating to attitude towards strength training which might provide insight toward promoting greater adherence. For example, when responding to “*Supervision by a personal trainer reduces anxiety over performing strength training*”, and “*Supervision by a PT improves confidence when performing strength training*”, a greater number of females agreed with these statements compared to males. However, once again, the proportion of males which did not agree did not answer in the contrary but rather answered “*neither agree nor disagree*”, suggesting that they do not present opposing views but simply do not feel as strongly. These responses add further support for the previous theme of male confidence, specifically in strength training. Notably, some of the questions related specifically to clients of Discover Strength; for example, all personal trainers are required to have a bachelor’s degree

and be at the least American College of Sports Medicine certified as an exercise physiologist. In addition, clients do not book with a trainer per se, but rather book a time and are assigned a trainer working that shift. Based on these points, questions such as “*I have confidence in my personal trainer because of their qualifications*”, and “*I enjoy working with a team of different personal trainers*” were deemed important but did not produce differing responses between males and females.

Finally, it is worth noting the motivation displayed by the current cohort of participants. While we recognize that many of them have been engaging in 1-on1 personalized strength training for a long period, it is also worth noting that the section asking after adherence (e.g., “*My strength training workouts are more frequent because of supervision by a PT*”; question 10.1, table 2) received the lowest positive score compared to the other characteristics. It seems that, within the present participants, accountability/adherence, while important, is of equally lesser importance to males and females. From this perspective it is perhaps worth reviewing accountability as a characteristic of supervision. For example, while supervision might promote greater adherence through accountability [1], there are studies where adherence was similar in supervised and unsupervised conditions [25-26], and still physical outcome measures favored supervised training conditions.

In contrast the analysis of the qualitative data identified accountability/adherence as the most frequently discussed characteristic (n=37). These included comments around long-term adherence and maintaining consistency being more achievable with supervision compared to previous experiences of training alone. Program design was also mentioned with a degree of frequency (n=27) including comments of knowledge and expertise. While these comments might be specific to the trainers at Discover Strength as an organization based on the minimum qualifications, it is worth recognizing the importance of knowledge/expertise in exercise professionals and the confidence this bestows in clients since lack of knowledge/perceived complexity is an often-cited barrier to strength training [4]. While these qualitative comments might appear contradictory to the discussion of confidence to program a workout and train without supervision, we should recognize that the majority of participants responded favorably to supervision for program design and that these qualitative comments make up only a small percentage (~7%) of total participants.

The qualitative data also identified the themes of professional relationships (also using the terms confidence, and professionalism), and adaptations. Much of the previous literature appears to have overlooked the importance of the personal relationship between the trainer and trainee. However, this was stressed with many positive comments as well as some participants responding that they valued consistency and didn't like working with different trainers. This theme was perhaps clarified best where a participant made the analogy of their personal trainer to other medical professionals – that of a dentist or doctor. This comparison is validated where other participants responded by highlighting the positive adaptations from strength training for quality of life as they age, as well as for their health during medical conditions (cancer treatment, stroke, recovery from injury). All qualitative data is available here <https://osf.io/rfxwb/>.

Table 2. Dominant to responses to specific questions about each characteristic of supervision (PT = personal trainer, * denotes >5% difference in response between males and females).

Theme	Question	Response	Males	Females	
Technique	6.1. <i>My technique is good because my strength training workouts are supervised</i>	Agree / strongly agree	96%	96%	
	6.2. <i>My technique would always be good even without supervision</i>	Disagree / strongly disagree	62%	70%	*
		Agree / strongly agree	17%	12%	*
	6.3. <i>I value feedback about my technique from a PT</i>	Agree / strongly agree	99%	99%	
	6.4. <i>I dislike it when my PT corrects my technique</i>	Disagree / strongly disagree	94%	96%	
	6.5. <i>Technique during strength training is impactful in my ability to meet my desired goals</i>	Agree / strongly agree	94%	96%	
Effort	7.1. <i>My effort level is highest because my strength training workouts are supervised</i>	Agree / strongly agree	95%	95%	
	7.2. <i>My effort level would always be high even without supervision</i>	Disagree / strongly disagree	58%	69%	*
		Agree / strongly agree	22%	17%	*
	7.3. <i>I value a PT pushing me to work harder</i>	Agree / strongly agree	96%	95%	
	7.4. <i>I dislike it when my PT pushes me too hard</i>	Disagree / strongly disagree	81%	71%	*
		Agree / strongly agree	7%	16%	*
	7.5. <i>Effort during strength training is impactful in my ability to meet my desired goals</i>	Agree / strongly agree	99%	98%	
Programme Design	8.1. <i>My strength training workouts are better because of programming by a PT</i>	Agree / strongly agree	97%	97%	
	8.2. <i>I would feel confident to track and program my own workouts without a PT</i>	Disagree / strongly disagree	58%	79%	*
		Agree / strongly agree	19%	6%	*
	8.3. <i>I value my PT tracking and progressing my workouts over time</i>	Agree / strongly agree	96%	99%	
	8.4. <i>I dislike it when my PT progresses my load/changes exercises without discussion</i>	Disagree / strongly disagree	76%	78%	
	8.5. <i>The strength training program I use is impactful in my ability to meet my goals</i>	Agree / strongly agree	99%	97%	
Enjoyment	9.1. <i>My strength training workouts are more enjoyable because of supervision by a PT</i>	Agree / strongly agree	95%	94%	
	9.2. <i>I would enjoy my workouts to a similar extent without supervision</i>	Disagree / strongly disagree	74%	78%	
	9.3. <i>I value a PT encouraging me with positive feedback</i>	Agree / strongly agree	98%	97%	
	9.4. <i>I dislike it when my PT tries to motivate me</i>	Disagree / strongly disagree	94%	92%	
	9.5. <i>My enjoyment of strength training is impactful in my ability to meet my goals</i>	Agree / strongly agree	93%	93%	
Adherence	10.1. <i>My strength training workouts are more frequent because of supervision by a PT</i>	Agree / strongly agree	73%	76%	

	10.2. My workouts would have similar frequency if I were not meeting a PT	Disagree / strongly disagree	71%	75%	
	10.3. I value the accountability of meeting PT for strength training workouts	Agree / strongly agree	93%	96%	
	10.4. I dislike having to schedule strength training workouts	Disagree / strongly disagree	84%	87%	
	10.5. The regularity of my strength training is impactful in my ability to meet my goals	Agree / strongly agree	100%	98%	
Safety	11.1. My strength training workouts are safer because of supervision by a PT	Agree / strongly agree	93%	97%	
	11.2. My workouts would be equally safe even if I were not supervised a PT	Disagree / strongly disagree	69%	78%	*
		Neither agree nor disagree	21%	14%	*
	11.3. I value the safety of having a PT present for my strength training workouts	Agree / strongly agree	87%	96%	*
		Neither agree nor disagree	11%	3%	*
	11.4. My strength training workouts are too focused on safety	Disagree / strongly disagree	94%	92%	
	11.5. The safety of my strength training is impactful in my ability to meet my goals	Agree / strongly agree	86%	93%	*
		Neither agree nor disagree	11%	6%	*

Table 3. Other questions relating to perceptions of supervision (PT = personal trainer, * denotes >5% difference in response between males and females).

Question	Response	Males	Females	
12.1. Supervision by a PT optimizes strength training adaptations	Agree / strongly agree	92%	96%	
12.2. Supervision by a PT optimizes efficiency of a strength training workout	Agree / strongly agree	99%	98%	
12.3. Supervision by a PT reduces anxiety over performing strength training	Agree / strongly agree	72%	79%	*
	Neither agree nor disagree	22%	13%	*
12.4. Supervision by a PT improves confidence when performing strength training	Agree / strongly agree	90%	95%	*
	Neither agree nor disagree	8%	4%	
12.5. I have a more positive attitude toward strength training because of supervision by a PT	Agree / strongly agree	87%	89%	
12.6. Feedback from a PT is an important part of my strength training	Agree / strongly agree	96%	94%	
12.7. I have confidence in my PT because of their experience	Agree / strongly agree	96%	97%	
12.8. I have confidence in my PT because of their qualifications	Agree / strongly agree	94%	96%	
12.9. I enjoy working with a team of different PTs	Agree / strongly agree	69%	65%	

4.1. Limitations

We should acknowledge possible limitations of the present study. While there appears an apparent self-confidence in males above females in their capacity to have good technique, reach sufficiently high effort, and program and track their workouts, and this is consistent with previous literature, we should recognize some key points. Firstly, previous studies which have discussed this confidence portrayed by males have then demonstrated that it was unjustified, i.e. that they did not perform better than females in the given tasks. In this instance we cannot know whether males would be better in their technical and effort performance during strength training, or their capacity to program and track their workouts, only that they believe so. Secondly, with a growing body of social media cites discussing and portraying strength training and strength training guidance, it might be reasonable that males view this media more so than females, which has fueled a perception that they might be more capable on the points raised. A further possible limitation is the training experience of the participants in this study. Certainly, we cannot assume that previously untrained participants beginning strength training would place importance on the same characteristics to the same extent, or that they might share similar perceptions about their capacity to perform strength training without supervision.

5. Conclusions

In summary, our data suggests that males place greater importance on supervision for technical coaching, and less importance on safety and enjoyment as characteristics of supervision during strength training, compared to females. However, the data also suggests that males have a self-confidence that they are more capable of tracking and programming their own workouts and maintaining sufficiently high effort and quality of technique. This is supported by a body of literature considering higher self-confidence in males compared to females, potentially in particular relation to effort, role models, and verbal encouragement. Participants reported favorably regarding their physiology and adaptation to strength training including an analogy to medical professionals (doctors and dentists). Based on the overwhelming body of literature supporting the health benefits of strength training, this comparison seems justifiable and personal trainers and strength coaches should consider the importance and positive health implications when forging a trainer: trainee relationship. Finally, we encourage strength coaches and personal trainers to engage in the findings of this research to strengthen their understanding of client motives and sex differences, placing particular importance upon the motives of females who are underrepresented as engaging in strength training.

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Informed Consent Statement: Informed consent was obtained from all subjects involved in the study. Written informed consent has been obtained from the patient(s) to publish this paper.

Data Availability Statement: All survey questions, quantitative and qualitative data, and analyses are available at <https://osf.io/rfxwb/>.

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References

1. Fisher, J.P.; Steele, J.; Wolf, M.; Androulakis-Korakakis, P.A.; Smith, D.; Giessing, J. The Role of Supervision in Resistance Training; an Exploratory Systematic Review and Meta-Analysis. *Int J Strength Cond.* **2022**, *2*, 1.
2. Fisher J.; Androulakis-Korakakis P.; Giessing J.; Helms E.; Schoenfeld B.; Smith D.; Winett R. Supervision during resistance training: a comparison of trainer and trainee perceptions. *Int J Strength Cond.* **2023**, *3*, 1.
3. Nuzzo J.L. Sex Difference in Participation in Muscle-Strengthening Activities. *J Lifestyle Med.* **2020**, *10*, 110-115.
4. Winett R.A.; Williams D.M.; Davy B.M. Initiating and maintaining resistance training in older adults: a social cognitive theory-based approach. *Br J Sports Med.* **2009**, *43*, 114-9.
5. Fisher J.P.; Steele J.; Gentil P.; Giessing J.; Westcott W.L. A minimal dose approach to resistance training for the older adult; the prophylactic for aging. *Exp Gerontol.* **2017**, *99*, 80-86.
6. Westcott W.L. Resistance training is medicine: effects of strength training on health. *Curr Sports Med Rep.* **2012**, *11*, 209-16.
7. Shele G.; Genkil J.; Speelman D. A Systematic Review of the Effects of Exercise on Hormones in Women with Polycystic Ovary Syndrome. *J Funct Morphol Kinesiol.* **2020**, *5*, 35.
8. Petrov Fieril K.; Glantz A.; Fagevik Olsen M. The efficacy of moderate-to-vigorous resistance exercise during pregnancy: a randomized controlled trial. *Acta Obstet Gynecol Scand.* **2015**, *94*, 35-42.
9. Ward-Ritacco C.; Poudevigne M.S.; O'Connor P.J. Muscle strengthening exercises during pregnancy are associated with increased energy and reduced fatigue. *J Psychosom Obstet Gynaecol.* **2016**, *37*, 68-72.
10. Prevett C.; Kimber M.L.; Forner L.; de Vivo M.; Davenport M.H. Impact of heavy resistance training on pregnancy and postpartum health outcomes. *Int Urogynecol J.* **2023**, *34*, 405-411.
11. Shojaa M.; von Stengel S.; Kohl M.; Schoene D.; Kemmler W. Effects of dynamic resistance exercise on bone mineral density in postmenopausal women: a systematic review and meta-analysis with special emphasis on exercise parameters. *Osteoporos Int.* **2020**, *31*, 1427-1444.
12. Bocalini D.S.; Serra A.J.; dos Santos L.; Murad N.; Levy R.F. Strength training preserves the bone mineral density of postmenopausal women without hormone replacement therapy. *J Aging Health.* **2009**, *21*, 519-27.
13. Gajanand T.; Keating S.E.; Brown W.J.; Hordern M.D.; Fassett R.G.; Coombes J.S. Comparing the Efficacy of Supervised and Unsupervised Exercise Training on Glycaemic Control in Type 2 Diabetes: A Systematic Review. *Curr Diabetes Rev.* **2020**, *16*, 570-579.
14. Elo S.; Kyngäs H. The qualitative content analysis process. *J Adv Nurs.* **2008**, *62*, 107-15.
15. Atherton M. Measuring confidence levels of male and female students in open access enabling courses. *Iss Educ Res.* **2015**, *25*, 81-98.
16. Guillén L.; Mayo M.; Karelaia N. Appearing self-confident and getting credit for it: Why it may be easier for men than women to gain influence at work. *Hum Resour Manag.* **2018**, *57*, 839-54.
17. Corbin C.B.; Nix C. Sex-typing of physical activities and success predictions of children before and after cross-sex competition. *J Sport Exerc Psych.* **1979**, *1*, 43-52.
18. Dweck C.S.; Bush E.S. Sex differences in learned helplessness: I. Differential debilitation with peer and adult evaluators. *Dev Psychol.* **1976**, *12*, 147.
19. Dweck C.S.; Davidson W.; Nelson S.; Enna B. Sex differences in learned helplessness: II. The contingencies of evaluative feedback in the classroom and III. An experimental analysis. *Dev Psychol.* **1978**, *14*, 268.
20. Tully D.; Jacobs B. Effects of single-gender mathematics classrooms on self-perception of mathematical ability and post-secondary engineering paths: an Australian case study. *European J Eng Educ.* **2010**, *35*, 455-67.
21. Corbin C.B.; Landers D.M.; Feltz D.L.; Senior K. Sex differences in performance estimates: Female lack of confidence vs. male boastfulness. *Res Q Exerc Sport.* **1983**, *54*, 407-10.
22. Lirgg C.D. Gender differences in self-confidence in physical activity: A meta-analysis of recent studies. *J Sport Exerc Psychol.* **1991**, *13*, 294-310.
23. Corbin C.B.; Nix C. Sex-typing of physical activities and success predictions of children before and after cross-sex competition. *J Sport Exerc Psychol.* **1979**, *1*, 43-52.
24. Haines J.; Thrine A.; Titlebaum P.; Daprano C. Women and weight training: Education and demonstration make a difference. *Appl Res Coaching Athletics Annual.* **2008**, *23*, 237-254.

25. Storer T.W.; Dolezal B.A.; Berenc M.N.; Timmins J.E.; Cooper C.B. Effect of supervised, periodized exercise training vs. self-directed training on lean body mass and other fitness variables in health club members. *J Strength Cond Res.* **2014**, *28*, 1995-2006.
26. Coleman M.; Burke R.; Benavente C.; Piñero A.; Augustin F.; Maldonado J.; Fisher J.P.; Oberlin D.; Vigotsky A.D.; Schoenfeld B.J. Supervision during resistance training positively influences muscular adaptations in resistance-trained individuals. *J Sports Sci.* **2023**, *41*, 1207-1217.

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