Original Article

Doctoral Supervision in Sport Psychology

An asp-Commissioned Analysis of Candidate Satisfaction and Experience

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Abstract: Good supervision plays a pivotal role in fostering a range of skills crucial for academic and professional growth. This study presents a subgroup analysis of previously published data (see Müller et al., 2023) and aims to investigate doctoral candidates in sport psychology with respect to their perception and satisfaction regarding supervision, as well as facets of their supervisory situation. A total of 70 doctoral candidates in sport psychology in Germany (M_{age} = 30.81 years; SD_{age} = 3.60 years) provided information on their satisfaction with supervision and their perception of other facets of their supervisory situation (i.e., infrastructure, scientific work and thinking, relationship and health). Our results – which, due to incomplete data, do not consistently include all 70 participants – show that microecological (e.g., regular meetings, existence of a supervision agreement) and macroecological (i.e., time spent on doctoral research) aspects are positively related to doctoral candidates' supervision satisfaction and their perception of other facets of the supervisory situation. Despite generally positive supervision, some expressed dissatisfaction, prompting recommendations for future improvements.

Keywords: doctorate, supervision, satisfaction, PhD, university

Promotionsbetreuung in der Sportpsychologie. Eine von der asp in Auftrag gegebene Analyse zur Zufriedenheit und Erfahrung der Promovierenden

Zusammenfassung: Gute Supervision spielt eine entscheidende Rolle bei der Förderung einer Vielzahl von Fähigkeiten, die für die akademische und berufliche Entwicklung entscheidend sind. Diese Studie enthält eine Subgruppenanalyse zuvor veröffentlichter Daten (siehe Müller et al., 2023) und zielt darauf ab, Promovierende in der Sportpsychologie hinsichtlich ihrer Wahrnehmung und Zufriedenheit mit der Promotionsbetreuung sowie verschiedener Aspekte ihrer Betreuungssituation zu untersuchen. Siebzig Doktorand_innen der Sportpsychologie (M_{Alter} = 30.81 Jahre; SD_{Alter} = 3.60 Jahre) gaben Informationen über ihre Zufriedenheit mit ihrer Betreuung und ihre Wahrnehmung anderer Facetten der Betreuungssituation (d.h. Rahmenbedingungen, wissenschaftlich Arbeiten und Denken, Beziehung und Gesundheit). Unsere Ergebnisse, die aufgrund unvollständiger Daten nicht durchgehend alle 70 Teilnehmenden einschließen, zeigen, dass einzelne Aspekte auf der Mikroebene (z.B. regelmäßige Treffen, Betreuungsvereinbarung) und Makroebene (z.B. Zeit für die eigene Forschung) positiv mit der Betreuungszufriedenheit der Doktorand_innen sowie ihrer Wahrnehmung anderer Facetten der Betreuungssituation zusammenhängen. Obwohl unsere Ergebnisse eine grundsätzlich positive Betreuungssituation in der Sportpsychologie in Deutschland anzeigen, sprechen wir uns dafür aus, fortlaufende Bemühungen zur Verbesserung der Betreuungspraktiken in der Zukunft zu unterstützen.

Keywords: Promotion, Supervision, Zufriedenheit, PhD, Universität

Achieving a doctoral degree is considered one of the greatest individual academic achievements. The primary objective of doctoral programs is to equip students with advanced research skills under the guidance of one or more supervisors. Doctoral supervisors play a pivotal role in fostering a range of skills crucial for academic and professional growth, including disciplinary, intellectual, methodological, didactical, social, and personal competencies. Cultivating these skills in doctoral candidates demands significant time commitment, dedication, and persistence on the part of supervisors. The fact that this dedication is necessary for doctoral candidates but also essential for universities is highlighted by the finding that 33% of all publications are authored by doctoral candidates (Larivière, 2012) and that doctoral candidates are also responsible for over 50% of the research output of universities (Barry et al., 2018). At the same time, research indicates that doctoral candidates tend to have low levels of well-being (Wollast et al., 2023), are largely at risk of developing common psychiatric disorders (Levecque et al., 2017), and are six times more likely to experience depression and anxiety compared to the general population (Evans et al., 2018). Possibly related to these issues, approximately 43% of German doctoral candidates do not complete their degrees (Bundesbericht Wissenschaftlicher Nachwuchs [BuWiN], 2021). Studies suggest that higher levels of stress in doctoral candidates and the large dropout rates might be caused by factors related to their supervision (e.g., see scoping review by Mackie & Bates, 2018). Thus, the purpose of this study was to investigate the current situation, including doctoral candidates' perception of and satisfaction with their supervision in the field of sport psychology. To achieve this goal, we conducted a subgroup analysis based on the data from Müller et al. (2023), focusing on doctoral candidates in the field of sport science.[1]

The rationale for a focused examination of sport psychology, beyond the intrinsic interest in one's own discipline, stems from the interdisciplinary nature of sports science. Each subdiscipline is rooted in its respective parent disciplines (see Hägele's ideal-typical model of sports science, 1996, in Barisch-Fritz, 2016), which are inherently distinct. These distinctions are evident in various dimensions, including the application of theory, methodological approaches, types of data analysis, and overarching research paradigms (for a detailed discussion, see Pull et al., 2016). Consequently, it can be assumed that such variations in scientific cultures are also reflected in the subdisciplines of sports science and that the systems within which they operate may be influenced differently. Adopting a system-ecological perspective (e.g., Bronfenbrenner, 2005), it appears reasonable to suggest that variations within the parent disciplines (Pull et al., 2016) could lead to differing doctoral and supervising cultures across the subdisciplines. Therefore, a discipline-specific focus on sports psychology is both meaningful and necessary. Based on potential findings, such a focused approach allows for the development of discipline-specific recommendations for action. These could be implemented, for instance, within professional associations, such as through the *Arbeitsgemeinschaft für Sportpsychologie e.V.* (German Association of Sport Psychology).

Ecological Systems Theory in Doctoral Supervision

On a theoretical level, Bronfenbrenner's ecological systems theory (2005) provides a basic theoretical framework for examining various levels of influence on a particular individual or phenomenon. This approach has also been utilized in previous studies to investigate doctoral students (see, e.g., Wang et al., 2024). Of interest is the level closest to these individuals or the microecological level, which features direct interactions between the doctoral candidate and supervisor, including the structure or framework established by the supervisor to interact with the doctoral candidate. At the macroecological level, which entails factors beyond individual interactions, aspects on a broader institutional or systemic level are considered. These include, for example, contracts, policies, and resources available to doctoral candidates. Macroecological factors can influence how the environment is structured, what opportunities and resources are available to doctoral candidates, and how fair or transparent the dissertation process is. By applying this approach, researchers can develop a comprehensive understanding of the dynamics and challenges of doctoral candidates and identify potential intervention points at each of the different levels (Wang et al., 2024).

On the microecological level, good supervision plays a fundamental role in the education of doctoral candidates, since almost all doctoral candidates are required to conduct one or more scientific studies that are rigorously designed.

[1] This article was commissioned by the German Association of Sport Psychology (asp). It presents an analysis of data collected from doctoral candidates in the field of sport psychology. The data represent a subsample of a larger dataset encompassing doctoral candidates in sport science. Findings from the full sample were previously published and discussed in Müller et al., 2023. The aim of the present article is to provide a focused analysis of the situation and experiences of doctoral candidates in sport psychology, tailored to readers with a specific interest in this subdiscipline.

This requires qualified supervision that ensures, for example, good scientific practice and high-quality research (Manderson et al., 2017). Also, good supervision can prevent scientific misconduct (Anderson et al., 2007), which may pose a danger for (young) scientists and has the potential to damage not only the reputation of the academic field but academia as a whole. Typically, supervisors are expected to assist their doctoral candidates in various research aspects, including discerning and critically analyzing pertinent literature, formulating the research protocol and acquiring proficiency in suitable methodologies, executing original research, handling and analyzing data, and composing research output for external evaluation (see also Wissenschaftsrat, 2023). Yet, there is more to academia than doing research in a narrow sense. Effective supervision also involves offering constructive feedback that fosters engagement and improvement of the doctoral candidate (e.g., Li & Seale, 2007), integrating students into the academic community, and providing institutional and personal assistance to the candidate as they evolve into a discerning scholar (Dietz et al., 2006).

Key Factors in Effective Doctoral Supervision and Support

In order to accomplish these goals, supervisors – according to doctoral candidates – should foster student confidence and be dependable, supportive, well-informed, instructive, and collaborative (Denicolo, 2004). Additionally, supervisors should possess strong listening skills, promote constructive argumentation and discourse, exhibit enthusiasm, demonstrate warmth and empathy (Seagram et al., 1998), and provide regular meetings (Heath, 2002). In detail, in a comprehensive study involving 561 doctoral candidates from Helsinki University, it was shown that regular meetings with supervisors, at least once a month, substantially decreased the likelihood of dropout (Pyhältö et al., 2022). Moreover, doctoral candidates who adhered to this frequency reported higher levels of satisfaction compared to their counterparts who met with their supervisors less frequently (Pyhältö et al., 2022). Another central aspect for ensuring transparent and regular communication is the supervision agreement (Meuleners et al., 2023). In recent years, the German Research Foundation (*Deutsche Forschungsgemeinschaft,* DFG), in particular, has strongly advocated for the establishment of agreements between doctoral candidates and supervisors in order to prevent misunderstandings, to improve the quality of supervision, and to enhance the success of doctoral projects (2022). Nevertheless, studies indicate that, for instance, in German life science programs, only about 40 % of doctoral program regulations explicitly report the existence of such agreements (Meuleners et al., 2023). This is similar to a Finnish study that reported only 44 % of doctoral candidates have a supervision agreement (Pyhältö et al., 2022). By contrast, the BuWiN study indicates that 75 % of doctoral candidates in Germany have a supervision agreement (2021). This indicates a substantial discrepancy across studies regarding the existence of supervision agreements. Overall, a good relationship between supervisors and doctoral candidates – defined in most cases by the doctoral candidate – is associated with higher levels of satisfaction and good progress in their research (Ives & Rowley, 2005).

However, it is not only the positive relationship between doctoral candidates and their supervisors that is important; a working environment in which doctoral candidates feel safe, healthy, and happy is also of relevance, as this can lead to higher levels of productivity (see theoretical model by Diener et al., 2020). Thus, from a macroecological perspective, several additional factors come into play. Financial insecurity is often considered a primary source of stress (e.g., La Touche, 2017) as well as an excessive workload (Hunter & Devine, 2016; Mackie & Bates, 2019). Also, feelings of loneliness due to working independently, as well as uncertain career prospects, are perceived as stressful (Polkinghorne et al., 2023). Further, a number of problematic aspects of university processes have been described, including the existence of unwritten rules, a lack of transparency, unclear expectations, and closed decision-making processes (see scoping review by Mackie & Bates, 2019). Given these challenges, it could be assumed that doctoral candidates who are employed as members of a university research team (i.e., doing their doctorate while employed at the university) are better at navigating university processes and politics. This could be due to their more frequent exposure to internal processes compared to doctoral candidates who are pursuing their doctorate studies independently (i.e., external doctoral candidates and not employed at the university). Also, team-based or internal doctoral candidates might profit more from university resources such as the support of student assistants. On the other hand, internal doctoral candidates may be excessively burdened by additional university tasks such as teaching and administration, with less time for research and, thus, increasing dissatisfaction. Another macro-level consideration is whether doctoral candidates are members of a mentoring program. Mentoring, compared to supervision, is characterized by a more personal and holistic relationship, often involving pastoral care and guidance beyond professional development (e.g., Lindén et al, 2013). Mentoring programs have been steadily growing in the field of sport science and are one of the factors contributing to a successful and fulfilling doctoral experience (e.g., for Germany, see Herfet & Tittlbach, 2023). It is assumed that a

strong mentor relationship can contribute to satisfaction during the doctoral journey (e.g., for Germany, see Krafft et al., 2023).

In conclusion, at the microecological level, doctoral candidates' satisfaction may be related to the relationship they have with their supervisor (e.g., Hunter & Devine, 2016). Furthermore, macroecological-level factors related to the university structure and its politics also have an impact on satisfaction (Mackie & Bates, 2019). That is, satisfaction with supervision may be related not only to direct supervision but also to other factors such as candidates' financial situation, workload, and mentoring situation.

The Present Study

Good supervision is one, albeit not the only, factor for the successful completion of a doctorate (Mackie & Bates, 2019). Poor supervision is related to lower levels of well-being and higher drop-out rates (Pyhältö et al., 2022; Wollast et al., 2023). Good supervision is related to good scientific practice (Anderson et al., 2007), improved health and well-being in doctoral candidates (Mackie & Bates, 2019), and to higher productivity (Ives & Rowley, 2005) on a microecological level. Additional macroecological factors such as workload (Hunter & Devine, 2016), affiliation with a research institution, or participation in a mentoring program (Leão & Ferreira, 2015) may also contribute to satisfaction among doctoral candidates. The present study, which comprises a subgroup analysis of previously published data (see Müller et al., 2023), aimed to investigate sport psychology doctoral candidates' perception and satisfaction with their supervision and facets of their supervisory situation in German-speaking countries. Based on previous research, the following microecological-level hypotheses can be derived: Doctoral candidates are more satisfied with their supervision and perceive other facets of their supervisory situation (i.e., infrastructure, scientific work and thinking, relationship and health) more positively:

1. the more frequently meetings with their supervisor take place (Heath, 2002; shown in Müller et al., 2023; Pyhältö et al., 2022);
2. the more helpful discussions with their supervisor are rated (see, e.g., Seagram et al., 1998);
3. the faster a meeting can be scheduled upon request (shown in Müller et al., 2023); and
4. when they have a supervision agreement (see DFG, 2022; shown in Müller et al., 2023).

Furthermore, macroecological-level hypotheses in the present study posit that doctoral candidates are more satisfied with their supervision and perceive other facets of the supervisory situation more positively when:

5. they conduct their doctorate studies while employed as members of a university research team (i.e., internally), due to closer connections to university structures and to being integrated in a scientific team (shown in Müller et al., 2023);
6. they can spend more time on their thesis (Hunter & Devine, 2016);
7. they have additional resources such as a student assistant, as this can reduce workload (see, e.g., Hunter & Devine, 2016; shown in Müller et al., 2023); and
8. they participate in a mentoring program (see, e.g., Leão & Ferreira, 2015).

Method

Participants and Procedure

From March 21, 2023, to May 22, 2023, invitation to participate in an online survey about doctoral supervision in sports science was advertised via the following channels: (a) the "Sportwiss" mailing list of Ruhr University Bochum (https://lists.ruhr-uni-bochum.de/mailman/listinfo/sportwiss; 3,500 subscribers as of March 2019); (b) an internal mailing list of junior researchers at sports science institutions in Germany, Austria, and Switzerland; and (c) the social media channels of the German Association of Sports Science (*Deutsche Vereinigung für Sportwissenschaft:* dvs) Commission "Scientific Junior Researchers" (Twitter: @SpowisNachwuchs) and the German Association of Sport Psychology (*Arbeitsgemeinschaft für Sportpsychologie in Deutschland e.V.:* asp; Twitter: @asp_sportpsycho). Participation in the survey was open to all individuals who, at the time of the survey, were either working on a sports science doctorate or had already completed one (up to a maximum of 3 years after receiving their doctorate certificate; see Müller et al., 2023). The aim of the survey was to gain more information about the current supervision situation in sport science in German-speaking countries. In total, 275 doctoral candidates replied to the survey, which was programmed via LimeSurvey. From this overall sample (Müller et al., 2023), the data of 70 doctoral candidates from sport psychology were analyzed in the present paper. This subsample was aged between 24 and 39 years (M_{age} = 30.81; SD_{age} = 3.60). Of the participants, 47 were female and 23 were male.

Instrument

The basis for the survey was the questionnaire used for awarding the asp Supervision Prize the "Goldene Hand" ("Golden Hand"; for details, see Müller et al., 2023). The "Goldene Hand" is awarded every 2 years by the asp and honors outstanding doctoral supervisors in German-speaking countries in the field of sport psychology. The questionnaire entails a total of 18 questions on three facets of supervision: infrastructure (seven questions, e.g., "My main supervisor motivates and encourages me to participate in further training measures such as in teaching, methodology, self-presentation, dissertation preparation"; "My main supervisor encourages and promotes national networking. For example, by helping me build my own networks through research exchanges and actively involve me in their own networks"); scientific work and thinking (six questions, e.g., "My main supervisor encourages and promotes independent [academic] work"; "My main supervisor stimulates my scientific and interconnected thinking in my subject area"); and relationship and health (five questions, e.g., "My main supervisor is appreciative and trusting in their interaction with me"; "My main supervisor takes into account my individual life situation [e.g., children, illnesses, family situation, competitive sports, living situation, personal needs] extensively"). Each question was evaluated on a Likert scale from 1 = *does not apply at all* to 7 = *applies completely*. Thereby, we aimed to assess the perception of relevant facets of the supervisory situation. Furthermore, a question on satisfaction with overall supervision (7-point Likert scale: 1 = *not satisfied at all* to 7 = *extremely satisfied*) was asked.

In addition, relevant demographic data (i.e., age, gender) as well as data regarding the participant's doctorate (i.e., duration; article-based vs. a monograph; internal vs. external) and conditions of the doctorate on a microecological level were assessed. Specifically, this included questions on the supervisor's age and gender; cosupervisor, yes versus no; number of meetings ("How frequently do meetings or discussions regarding your research work occur with your main supervisor?": weekly, bi-weekly, monthly, every 2 months, every 3 months, every 4–6 months, every 6–12 months, less than once a year, never); quality of meetings ("If you've discussed your research work, was this helpful?": from 1 = *not at all helpful* to 7 = *very much helpful*); waiting time for a meeting ("How long does it typically take for your supervisor to schedule a meeting to discuss your research work?": less than a week, between 1 and 2 weeks, between 2 and 4 weeks, between 4 and 8 weeks, between 2 and 3 months, between 3 and 6 months, longer than 6 months); supervisory agreement (yes vs. no) as well as a question on whether it is perceived as helpful (from 1 = *not at all helpful* to 7 *very much helpful)*.

On a macroecological level, questions were proposed regarding the employment situation (employed in a university research team: yes vs. no; % of a full time contract; third-party funding vs. scholarship); workload and work distribution according to the time dedicated to doctoral research, teaching, and administration (as percentage); access to additional resources such as a student assistant (yes vs. no vs. sometimes); and finally, participation in a mentoring program (yes vs. no) as well as whether mentoring is perceived as helpful (from 1 = *not at all helpful* to 7 *very helpful)*.

Data Analysis

The data were analyzed using SPSS 29. To test Hypotheses 1–3 (frequency of meetings, helpfulness of discussion, timely scheduling) at the microecological level, Spearman correlations were computed. To test Hypothesis 4 (supervisory agreement yes vs. no) at the microecological level, independent sample *t* tests were conducted. Similarly, independent sample *t* tests were conducted for Hypothesis 5 (internal vs. external) and Hypotheses 7 (extra support yes vs. no) and 8 (mentoring program yes vs. no) on a macroecological level, whereas a Spearman correlation was performed for Hypothesis 6 (time allocated to PhD). The level of significance was set at $p < .05$. No correction for Type I errors was applied, following recent recommendations by Rubin (2024) for evaluating separate, individual hypotheses.

Results

Descriptive Data

Doctoral Candidates

In total, 70 sport psychology doctoral candidates (93% from Germany) participated in the online survey, of whom 20% ($n = 14$) had already finished their doctorate (duration: 4.44 years, $SD = 0.75$; range 3.5–6.01 years). The remaining 80% ($n = 55$) had, on average, been engaged in their doctoral studies for 2.71 years ($SD = 1.80$; range 0.14–7.99 years). As not all participants answered every question, we report the total number of answers if these deviate from 70.

The vast majority of study participants stated that their doctoral thesis was the basis of published research articles (article-based dissertation, 85.7%). Only 11.4% reported their doctoral thesis was in the form of a monograph, with

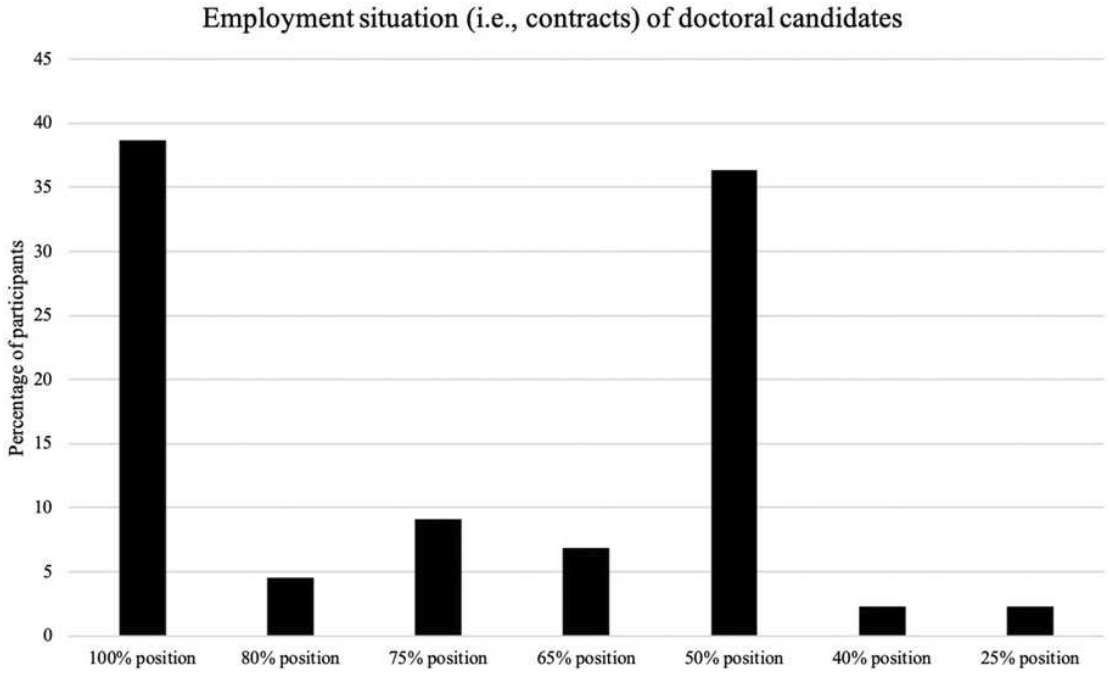

Figure 1. Contractual employment levels (%) of doctoral candidates in sport psychology (n = 44).

two additional individuals combining both approaches. The majority of doctoral candidates pursued their doctorate *internally* (80 %), meaning that they were completing their doctorate while they were an employed member of a research team at a university. Only nine individuals stated they were pursuing their doctorate independently (i.e., not employed at the university), and five individuals indicated that they were unsure of their situation.

Microecological Level

Supervisor. In most cases, the *main supervisor* (91 % of n = 56) was involved in doctoral supervision, with a *cosupervisor* present in 73 % of cases. Additionally, nearly 60 % of participants indicated the involvement of an additional *unofficial supervisor* (e.g., person without official right to supervise such as a postdoctoral researcher). *Main supervisors* were predominantly male (75 % out of n = 51) and held professorial positions (90 % of n = 51). Cosupervisors (n = 15) were almost equally distributed between genders, with half holding professorships and nearly 20 % holding adjunct professorships. Unofficial supervisors (n = 47) were slightly more likely to be female (57 %) and typically held postdoctoral positions (74 %).

Quantity and Quality of Meetings. Doctoral candidates met with their main supervisor on a weekly basis (20.8 %), monthly (18.8 %), every 1–3 months (25 %), every 3–6 months (14.6 %), every 6–12 months (16.7 %), or less frequently than once a year (4.2 %). Overall, 70 % perceived these meetings as somewhat helpful to very helpful, that is, 5–7 on a 7-point Likert scale (from 1 = *not helpful at all* to 7 = *very helpful*).

Waiting Time for Meetings. A total of 80 % (of n = 51) of participants waited 1–2 weeks for a meeting request to be scheduled, while the rest waited approximately 4–8 weeks.

Supervisory Agreement. In total, 44.3 % (of n = 54) of respondents had a *supervision agreement*. The current data revealed that almost half of the respondents (45 % of n = 31) did not find the supervision agreement helpful, while 42 % perceived it as beneficial.

Macroecological Level

Employment Situation. Out of 49 doctoral candidates, only five had secured permanent positions at a university, while the remainder were employed on fixed-term contracts. Regardless of whether participants were funded by the institution's budget or by third-party funding, 38.6 % of positions were full-time, while 36.4 % were part-time. See Figure 1 for further details on participants' employment.

On average, doctoral candidates working at a university dedicated approximately 40 % of their *working time* to their doctoral research (n = 36, range 5 %–75 %) and about 25 % to teaching duties (n = 34, range = 0 %–75 %). On average, the doctoral candidates (n = 46) were required *to teach* 3.26 credit hours per semester (SD = 3.44, range = 0–18 credit hours). A smaller portion of time was allocated to management and administrative tasks (n = 28, 14 %, range = 3 %–50 %). About half of the doctoral candidates

Table 1. Descriptive data of satisfaction with supervision and perception of other facets of the supervisory situation in sport psychology

	n	*M*	*SD*	Range
Satisfaction	53	4.53	1.76	1.00 – 7.00
Perception of infrastructure	46	4.49	1.54	1.50 – 7.00
Perception of scientific work and thinking	48	5.17	1.52	1.00 – 6.86
Perception of relationship and health	44	4.76	1.72	1.20 – 7.00

(52.7%) occasionally had the additional support of a *student assistant*, whereas 18.2% had no support, and 29.1% had regular support.

Mentoring Program. Only 35.8% (of $n = 53$) of participants were enrolled in or planned to enroll in a *mentoring program*. Doctoral candidates who were recipients of mentoring were very satisfied with the program ($n = 13$; $M = 5.92$, $SD = 0.76$).

Satisfaction With Supervision and Perception of Other Facets of the Supervisory Situation. Overall, doctoral candidates were satisfied with their general supervision situation ($n = 53$; $M = 4.53$; $SD = 1.76$). Furthermore, candidates perceived other facets of the supervisory situation (i.e., infrastructure, scientific work and thinking, and relationship and health) as consistently positive (see Table 1; see Supplementary material [ESM 1] for table including confidence intervals).

Factors Related to Satisfaction and Other Facets of the Supervisory Situation

Microecological Level

Spearman correlations indicated that satisfaction with supervision, along with the perception of other facets of the supervisory situation, was positively correlated with the quantity (i.e., frequency of meetings with the main supervisor, Hypothesis 1) and the quality of meetings (i.e., helpful discussions, Hypothesis 2), as well as their timely scheduling (Hypothesis 3; see Table 2 for details).

Finally, independent samples *t* tests showed that doctoral candidates who had a supervision agreement did not report being more satisfied in general with their supervision, $t(51) = 1.792$, $p = .079$, $d = 0.499$, 95% CI [–0.052, 1.050] ($n_{\text{supervision agreement yes}} = 30$ vs. $n_{\text{supervision agreement no}} = 23$). However, doctoral candidates who had a supervision agreement reported being more satisfied with other facets of the supervisory situation such as infrastructure, $t(43) = 2.617$, $p = .012$, $d = 0.783$, 95% CI [0.173, 1.393] ($n_{\text{supervision agreement yes}} = 25$ vs. $n_{\text{supervision agreement no}} = 20$), scientific work and thinking, $t(45) = 2.637$, $p = .012$, $d = 0.765$, 95% CI [0.170, 1.360] ($n_{\text{supervision agreement yes}}$ 26 = vs. $n_{\text{supervision agreement no}} = 21$), as well as relationship and health, $t(41) = 2.712$, $p = .010$, $d = 0.831$, 95% CI [0.204, 1.458] ($n_{\text{supervision agreement yes}} = 24$ vs. $n_{\text{supervision agreement no}} = 19$; Hypothesis 4).

Macroecological Level

Independent samples *t* tests showed no distinction between doctoral candidates who completed their doctorate internally (i.e., employed in a university research team) and those who complete it independently (*p*s ranging from .569 to .210, Hypothesis 4).

Spearman correlation analysis showed that the more time doctoral candidates allocated proportionally to their research, the more satisfied they were with their overall supervision (Hypothesis 6). Also, they perceived other facets of the supervisory situation more positively (i.e., infrastructure and scientific work and thinking; see Table 2 for details). Extra support in the form of student assistants was not related to satisfaction or other facets of the supervisory situation (*p*s ranging from .356 to .138, Hypothesis 7). However, there was a descriptive trend suggesting that doctoral candidates with continuous assistance from a student assistant tended to rate the aspect of scientific work and thinking higher ($n = 15$; $M = 5.62$, $SD = 1.17$) compared to those who only occasionally utilized such assistance ($n = 19$; $M = 4.63$, $SD = 1.74$) and those who had no help at all ($n = 4$; $M = 4.38$, $SD = 2.15$).

Finally, being part of a mentoring program did not seem to be related to satisfaction or the perception of other facets of the supervisory situation (*p*s ranging from .928 to .725, Hypothesis 8).

Discussion

This study investigated the satisfaction of doctoral candidates in sport psychology with regard to their supervision and perception of facets of their supervisory situation. To this end, we examined these aspects at micro- and macroecological levels. Ensuring that doctoral candidates receive high-quality supervision should be of interest not only to the field of sport psychology but to universities and the research community in general. Doctoral candidates are regarded as "society's future knowledge workers" (Mackie & Bates, 2019, p. 2), and some of these individ-

Table 2. Spearman correlation coefficients of satisfaction with supervision, perception of other facets of the supervisory situation, and micro- and macroecological-level aspects

		1	2	3	4	5	6	7	8	9	10
	1. Overall satisfaction supervision	–									
Perception of facets of the supervisory situation	2. Infrastructure	.650** (*n* = 45)	–								
	3. Scientific work and thinking	.809** (*n* =47)	.742** (*n* = 46)	–							
	4. Relationship and health	.811** (*n* =43)	.648** (*n* = 44)	.826** (*n* = 44)	–						
Micro-ecological level	5. Meeting frequency[a]	-.480** (*n* = 50)	-.541** (*n* = 46)	-.564** (*n* = 44)	-.542** (*n* = 51)	–					
	6. Helpfulness discussions	.747** (*n* = 50)	.650** (*n* = 46)	.776** (*n* = 46)	.660** (*n* = 44)	-.583** (*n* = 51)	–				
	7. Time from request to meeting	-.398** (*n* = 50)	-.324* (*n* = 46)	-.636* (*n* = 46)	-.345* (*n* = 44)	.425** (*n* = 51)	-.405** (*n* = 51)	–			
Macro-ecological level	8. Time spent on thesis/own research	.283 (*n* = 35)	.298 (*n* = 30)	.244 (*n* = 32)	.255 (*n* = 29)	-.092 (*n* = 32)	.300 (*n* = 32)	-.129 (*n* = 32)	–		
	9. Time spent on teaching	-.166 (*n* = 33)	-.118 (*n* = 28)	-.082 (*n* = 30)	.105 (*n* = 26)	.018 (*n* = 30)	-.132 (*n* = 30)	-.069 (*n* = 30)	-.227 (*n* = 33)	–	
	10. Time spent on administration	.200 (*n* = 28)	-.063 (*n* = 25)	-.017 (*n* = 26)	.048 (*n* = 23)	-.149 (*n* = 26)	.193 (*n* = 26)	-.037 (*n* = 26)	-.381 (*n* = 26)	-.188 (*n* = 24)	–

Note. [a]Lower meeting frequency values correspond to more frequent meetings (1 = weekly, 2 = bi-weekly, 3 = monthly, 4 = every 2 months, 5 = every 3 months, 6 = every 4–months, 7 = every 6 – 12 months, 8 = less than once a year, 9 = never). *$p < .05$; **$p < .01$.

uals will be part of the next generation of researchers. Overall, the results paint a generally positive picture of the supervisory situation in the German-speaking field of sport psychology. Both general satisfaction of supervision and perception of specific facets of individuals' supervisory situation are high on average. Moreover, it is evident that particular aspects of the microecological level, that is, aspects related to the supervisor, are related to higher satisfaction and a better perception of the supervisory situation.

Microecological Level

In line with Hypotheses 1–4, we found that microecological-level aspects are related to general satisfaction with supervision and/or facets of the supervisory situation. Our results are in line with research stating the importance of regular meetings with supervisors (Heath, 2002; Pyhältö et al., 2022). For example, a Finnish study revealed that doctoral candidates contemplated quitting less frequently and were more satisfied when they met for advisory sessions at least once a month (Pyhältö et al., 2022). However, in the current sample only approximately 40 % of doctoral candidates met this criterion, with the rest met with their supervisors less than once a month. Among those remaining, almost half of the candidates (44.83 %) met at least once a month with either their cosupervisor or unofficial supervisor. Despite this effort to substitute supervision, considerable potential remains for improving supervision by increasing the frequency of meetings with the main supervisors. Furthermore, it is not surprising that the more helpful that discussions with the supervisor are rated, the more satisfied doctoral candidates are with their supervision (see Hypothesis 2) and the more positively they perceive other facets of their supervisory situation (Seagram et al., 1998). Through helpful and constructive discussions, doctoral candidates develop positively, both scientifically and personally (see also Li & Seale, 2007).

Furthermore, the faster a meeting can be scheduled upon request, the more satisfied doctoral candidates are in general with their supervision and the more positively they perceive other facets of their supervisory situation (Hypothesis 3). This seems coherent, as promptly scheduling meetings or taking the necessary time might demonstrate the main supervisor's appreciation of the doctoral candidate. The correlation data provide an indication of this potential relationship, as the relationship and health subscale is rated more positively when meetings are scheduled more promptly. However, on a descriptive level, it should be noted that more than half of the doctoral candidates have an additional supervisor. While this arrangement may potentially lead to conflicts, it might also compensate for the absence of the main supervisor. Moreover, studies have demonstrated that having more than one supervisor during a doctoral program is beneficial in enhancing a sense of relatedness and in promoting autonomy and competency in research (Khosa et al., 2024).

Finally, practically in line with our fourth hypothesis, our data show that doctoral candidates perceive other facets of the supervisory situation more positively when they have a supervision agreement (see DFG, 2022). However, the fact that only 44.3 % of doctoral candidates have such an agreement warrants critical consideration. Although the number is comparable to Finish doctoral candidates (i. e., 44 % in Pyhältö et al., 2022), this figure is notably lower compared to the BuWiN study (2021, p. 30), which reported a 75 % rate of supervision agreements. Despite the fact that almost half of doctoral candidates do not find the supervision agreement helpful, our data suggest that a supervision agreement can provide a great opportunity for transparency and satisfaction during the doctoral period.

Macroecological Level

Contrary to our expectations, we confirmed only one out of four hypotheses regarding the macroecological level. We observed that for the majority of aspects at the macroecological level, there were no discernible associations with general satisfaction with supervision or the perception of other facets of the supervisory situation.

Contrary to our expectations, other aspects, such as access to additional resources, did not relate to satisfaction with supervision or perception of facets of the supervisory situation (see, e. g., Hunter & Devine, 2016). However, in light of previous research showing that instrumental support contributed only marginally to good supervision (Pyhältö et al., 2022; p. 24), our findings are unsurprising. Furthermore, conducting doctoral studies while employed as a member of a university research team does not offer the advantages that we had expected. Contrary to what we expected, doctoral candidates who pursue their doctorate externally are more satisfied on a descriptive level. This could be due to the fact that external doctoral candidates do not experience double dependence on their supervisor, in that the success of their dissertation does not have the potential to affect their financial situation or income. Alternatively, satisfaction could be related to the relatively low burden of other university-related tasks. However, as the sample size of external doctoral candidates was very small (n = 8), results need to be interpreted with caution.

Finally, the fact that participation in mentoring programs was not related to differences in satisfaction is contrary to what we expected (see e.g., Leão & Ferreira, 2015). However, given that mentors are not directly involved with supervision as such, it seems understandable that there may not be a correlation. Nevertheless, doctoral candidates participating in mentoring programs are very satisfied. Therefore, based on the current data and previous experience from mentees (e.g., Krafft et al., 2023), we would encourage supervisors to recommend doctoral mentoring programs to their candidates.

Overall, our data show that the supervisor is *the* pillar of good supervision. Although previous literature has stated that supervision is embedded in the structure of university and politics (Mackie & Bates, 2019) and that university structures should change and adjustments should be made (e.g., scope and length of contract to ensure security), it is still the supervisor who can have a significant impact on the satisfaction of the doctoral candidate.

Limitations and Future Research

Although the initial sample size appeared to be satisfactory, we consistently had sample sizes of only 40–50 individuals for most responses, which reduced the statistical power of the respective tests. With a total of 40 professorships for sports psychology in Germany (based on the asp homepage, March 20, 2024) and an average supervision rate of 2.9 doctoral candidates per professor (based on the complete dataset within sports science; see Müller et al., 2023, p. 14), the response rate is satisfactory and we believe that we were able to provide a fairly representative picture of the supervision situation in sport psychology in Germany. It should be noted, however, that this was an online survey, and thus selection biases may have occurred. It is possible that primarily doctoral candidates responded, who are either particularly satisfied or dissatisfied with their supervision and aspects of the supervision situation (see Müller et al., 2023, for further discussion). It is critical to address the fact that, as also noted by Müller and colleagues (2023), we did not survey those who discontinued their doctoral studies. It would be important to investigate further why doctoral candidates may have terminated their doctoral studies.

Another point worth mentioning, and to be addressed in future studies, is the importance of theoretical frameworks (Mainhard et al., 2009). Within the framework used in this study, it would be interesting to explore additional subsystems of Bronfenbrenner's theory (e.g., exosystem, mesosystem, chronosystem). However, this was challenging to achieve through questionnaires directly targeting doctoral candidates. Candidates are often not in a position to provide informed insights on aspects such as their supervisor's workload (exosystem) or the supervisor's relationships with their workplace or family (mesosystem). Addressing these aspects would require surveying the supervisors themselves and creating matched datasets. Future studies could focus on these dimensions, particularly on changes occurring during the doctoral journey (e.g., becoming a parent; chronosystem) to systematically explore how such factors influence this dynamic phase of life. This would enable a deeper understanding and more effective support for doctoral candidates during this critical period (Wang et al., 2024).

Additionally, the current study did not employ a theoretical model that is specific to the doctoral situation. Instead, it merely applied a larger heuristic framework that investigates person–environment interactions. However, future studies should consider utilizing established models such as the model of interpersonal supervisor behavior (see Mainhard et al., 2009) or Leary's interpersonal circle (Leary, 1957), which both emphasize the importance of the interpersonal relationship between supervisor and PhD student (or teacher and student) but rely heavily on personality assessments, and observational studies, which was outside the scope of the current study. Finally, Garfield's model (2005), which focuses on the structure and support of the PhD supervisor–student relationship, provides a useful supervisory management grid. This grid outlines how the relationship evolves over time, offering insights into how supervisors can adjust their support and guidance. These insights can be used to develop questionnaires for future research on supervisory practices, helping to assess and improve the dynamics between supervisors and PhD students throughout the doctoral journey.

Another limitation in this study was that the questionnaire was not validated (see details in Müller et al., 2023). Although this was not the goal of our survey, it might be intriguing for future studies to design and validate a questionnaire that measures quality and satisfaction of supervision. Established instruments that could serve as templates are the Postgraduate Research Experience Questionnaire (PREQ by Marsh, 2002) and the Supervisor–Doctoral Student Interaction Questionnaire (QSDI by Mainhard et al., 2009). Furthermore, additional studies could increasingly utilize qualitative research methods to gain clearer insights into doctoral candidates' current challenges (Mackie & Bates, 2019). Regardless of the chosen research methodology, it has been suggested to not only focus on the status quo, or existing doctoral situation, but also to consider the desired situation, as this may vary among doctoral candidates (e.g., Fraser, 1991).

Finally, it is important to emphasize that, based on qualitative data, certain aspects can be assumed to have a

causal relationship. However, this study is cross-sectional. While we assume that scheduling a meeting promptly might be perceived as respectful by the PhD candidate, or that a productive and supportive discussion with the supervisor could enhance the candidate's sense of support and satisfaction, these causal links should ideally be investigated in future longitudinal studies to confirm these assumptions.

Conclusion

Our data indicate that at a microecological level, both the supervisor and the structure they provide, in terms of meetings, reliability, and supervision agreement, are associated with differences in general satisfaction with supervision and/or perception of specific facets of the supervisory situation. Macroecological-level factors such as support from student assistants or participation in a mentoring program seem to play a less important role. Scheduling of supervisory meetings, however, is positively related to satisfaction. Thus, supervisors should set regular meetings (at least once a month), set appointments upon request by doctoral candidates (in a timely manner), and ensure their candidates possess a supervision agreement in order to provide a satisfactory work environment for doctoral candidates. Moreover, the workload of project-based or internal doctoral candidates should be carefully monitored by their main supervisors, whose direct authority over doctoral candidates can ensure more time for doctoral research. However, learning to cope with administrative tasks in the university context is important and part of the doctoral journey, even when these tasks are only indirectly related to research. Here, not only supervisors, but also those involved in university politics and scientific policy can shape better framework conditions for doctoral candidates.

Despite the overall positive outlook and the average satisfaction of doctoral candidates with their supervision situation, approximately 30 % of respondents are either dissatisfied or only somewhat satisfied. These dispiriting findings might be related to supervisors' lack of experience with the task of supervision, lack of awareness of the relevance of good supervision, unavailability, or neglect of candidates, among other leadership-related deficiencies (Hunter & Devine, 2016; Levecque et al., 2017). At the same time, research indicates that supervisors frequently receive insufficient training for their supervisory roles, potentially resulting in a deficiency of the necessary confidence and skills to guide doctoral candidates to successful completion (Richards & Fletcher, 2019). Initial training initiatives aimed at enhancing research practices, in particular, have demonstrated significant improvements in supervisors (Haven et al., 2023). Indeed, supervision is a skill that involves continuous learning. The implementation of additional training and mentoring programs for supervisors could also be a way forward in this regard (Hamilton et al., 2015). Supervision training is increasingly a part of education and training programs at universities, and it covers competence training/skills training of doctoral candidates as well as of postdoctoral fellows (UniWiND, 2019).

Finally, regular assessment of candidates' satisfaction with their doctoral situation and facets of their supervision situation in sport psychology is warranted, for example, every 5 years. Moreover, assessment of additional parameters that might affect doctoral candidates' health such as stress, well-being (see Mackie & Bates, 2019), financial insecurity (e. g., La Touche, 2017), feelings of loneliness, and job insecurity (Polkinghorne et al., 2023) would help to maintain a consistent focus on the education and well-being of our young researchers. Altogether, these measures with the potential to foster a scientific environment where individuals feel comfortable and motivated to perform are steps in the right direction to improve the work, well-being, and research outcomes of doctoral candidates (e. g., Diener et al., 2020).

Authors' statement

We would like to emphasize that this manuscript presents a subgroup analysis based on a previously published dataset (Müller et al., 2023). Our primary objective was to provide a focused account of the perceptions and satisfaction with PhD supervision among doctoral candidates in the field of sport psychology. We are convinced that this topic is of high relevance, and while we acknowledge the statistical limitations and potential concerns about redundant (or duplicate) publication, we are pleased that this article is being published. It is important to note that the original article was published in a non-peer-reviewed journal.

We firmly believe that future studies dedicated specifically to PhD supervision in sport psychology will benefit from a more rigorous methodological approach. However, we also wish to express our view that, in some cases, it is equally valuable to make data and key findings publicly available – if only to raise awareness of topics that might otherwise remain overlooked.

Electronic Supplementary Material

The electronic supplementary material is available at https://doi.org/10.1026/2941-7597/a000050
ESM 1. Table E1.

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