Psychische Anforderungen im Hochleistungssport und mentale Strategien zu deren Bewältigung

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Zusammenfassung

Die Dissertation untersuchte mit 5 Publikationen (2 Reviewartikel, 2 empirische Studien und eine Case Study) die spezifischen Anforderungen an Hochleistungssportler und mit welchen mentalen Strategien diese Anforderungen idealerweise bewältigt werden können. Der erste Review Artikel versuchte aufgrund des Studiums des bisherigen Forschungsstandes die wichtigsten Anforderungen und deren Bewältigungsstrategien in hochintensiven Sportarten zu ermitteln. Eine empirische Studie untersuchte Inhalte und Themen der sportpsychologischen Interventionen von Delegationsmitgliedern der Schweizer Olympiadelegationen 2006, 2008 und 2010 ($N = 575$). Der zweite Reviewartikel ging ebenfalls der Frage nach, welche psychologischen Anforderungen Hochleistungssportler zu bewältigen haben und inwiefern dass Achtsamkeit den Sportlern helfen könnte, diese Anforderungen besser zu bewältigen. Die zweite empirische Studie untersuchte daraufhin, welchen Einfluss dispositionelle Achtsamkeit und Wettkampfangst auf die sportliche Leistungserbringung von Spitzensportlern ($N = 133$) hat. Die Case Study beschreibt schliesslich die spezifischen Anforderungen eines Ruderers, indem eine Übertrainingsproblematik als sportspezifische Form einer Anpassungsstörung betrachtet wird und mit welchen Methoden der Sportler wieder erfolgreich zurück in seine sportliche Laufbahn begleitet wurde.

In der Arbeit zeigte sich, dass die psychischen Anforderungen an einen Hochleistungssportler mit der Bewältigung der eigenen und fremden Leistungserwartungen, dem Umgang mit den eigenen nicht adaptiven motivationalen Schemata im Zuge der (sportlichen) Zielverfolgung und der Verfolgung der psychologischen Grundbedürfnisse, der Regulation der eigenen Emotionen und schlussendlich einem adaptiven Umgang mit Umweltfaktoren zu tun haben.

Traditionsgemäss folgte psychologisches Training im Sport den Prinzipien der kognitiven Verhaltenstherapie, wonach die Kontrolle von negativen, dysfunktionalen Kognitionen direkt zu veränderten affektiven Zuständen und damit direkt auch zu verändertem Verhalten führt. Neuere Ansätze der sogenannten dritten Welle der Verhaltenstherapie streben eine Verhaltensänderung über Achtsamkeit und Akzeptanz von unangenehmem inneren Erleben an. Durch eine Erhöhung von psychischer Flexibilität durch die Anwendung von akzeptanz- und achtsamkeitsbasierter Methoden sollten Sportler besser befähigt sein, die oben beschriebenen Anforderungen zu bewältigen.

Abstract

The dissertation examined with 5 publications (2 review articles, 2 empirical studies and a case study) the specific demands on high performance athletes and which mental strategies help to ideally cope with these demands. The first review article tried to identify the most important demands and their coping strategies in high-intensity sports based on the current state of research. An empirical study examined contents and topics of the onsite sport psychology consultancy of delegation members of the Swiss Olympic delegations in 2006, 2008 and 2010 (N = 575). The second review article addressed likewise the question of what psychological demands top athletes have to cope with and to what extent dispositional mindfulness could help athletes to cope better with these demands. The second empirical study examined thereupon the influence of dispositional mindfulness and competition anxiety on the performance of top athletes (N = 133). Finally, the case study describes the specific requirements of a rower by considering an overtraining problem as a sport-specific form of an adjustment disorder and by which methods the athlete was successfully accompanied back into his sports career.

The studies showed that the psychological demands on a top athlete have to do with coping with one's own and others' performance expectations, dealing with one's own non-adaptive motivational schema in the course of pursuing (sporting) goals and pursuing basic psychological needs, regulating one's own emotions and finally dealing adaptively with environmental factors.

Psychological training in sport has traditionally followed the principles of cognitive behavioral therapy, according to which the control of negative, dysfunctional cognitions leads directly to altered affective states, and thus also directly to altered behavior. Newer approaches of the so-called third wave of behavior therapy aim at a change of behavior through mindfulness and acceptance of unpleasant inner experience. By increasing psychological flexibility through the application of acceptance and mindfulness based methods, athletes should be better able to cope with the demands described above.

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Inhaltsverzeichnis

1 Allgemeine Einleitung

Hochleistungsathleten müssen sich zahlreichen Anforderungen stellen und unterschiedliche psychische Herausforderungen meistern um schlussendlich erfolgreich eine Karriere durchlaufen zu können. Um sie in diesem Unterfangen zu unterstützen, versuchen ihnen Psychologinnen und Psychologen mentale oder psychologische Methoden und Strategien näher zu bringen – und das in der Schweiz seit nunmehr 50 Jahren[1]. Ziel der vorliegenden Dissertationsschrift ist es aufzuzeigen, welche psychischen Anforderungen und Herausforderungen Leistungssportlerinnen und Leistungssportler zu bewältigen haben und zu skizzieren, mit welchen Methoden Psychologinnen und Psychologen ihnen helfen können, diese Anforderungen zu meistern. Ein Hauptaugenmerk wird dabei den Veränderungen im Bereich der Verhaltenstherapie von der sogenannten ersten und zweiten Welle zur dritten Welle der Verhaltenstherapie (S. C. Hayes, 2004) und deren Auswirkungen auf die Anwendung im Sport gelegt. Dabei geht es auch explizit darum, Zusammenhänge zwischen Problemstellungen, verwendeten Methoden und möglichen Wirkmechanismen zu illustrieren. Hierzu wird in einem ersten Teil der allgemeinen Einleitung eine thematische Einordnung vorgenommen. Dazu werden mögliche Anforderungen an eine Spitzensportkarriere aufgezeigt und die Bandbreite von psychologischen Massnahmen vor dem Hintergrund der verschiedenen Wellen der Verhaltenstherapie aufgespannt. Im zweiten Kapitel werden die für die Arbeit relevanten Publikationen zusammengefasst und präsentiert, sowie dargelegt wie die Erkenntnisse der einzelnen Publikationen mit der übergeordneten Fragestellung in Verbindung stehen. Schlussendlich werden die Erkenntnisse in der abschliessenden Diskussion und Konklusion in einen grösseren Zusammenhang gestellt.

1.1 Psychologische Anforderungen an eine Spitzensportkarriere

Obwohl sich Sportpsychologinnen und Sportpsychologen schon seit mehreren Jahrzehnten mit der psychologischen Unterstützung und Begleitung von Sportlerinnen und Sportlern beschäftigen, finden sich in der Literatur lediglich wenige Arbeiten, welche sich mit den psychologischen Anforderungen unterschiedlicher Sportarten beschäftigen (z.B. Kellmann, Bussmann, Anders, & Schulte, 2006). Das ist umso erstaunlicher, als dass sich die Sportarten in hohem Masse voneinander unterscheiden. Dies wird klar, wenn wir die Anforderungen an einen Sportschützen, welcher in einem Qualifikationswettkampf 60 Schuss auf ein Ziel abgeben muss, mit den Anforderungen an einen Fussballspieler vergleichen. Bei

[1] 2019 feiert die Swiss Association of Sport Psychology (SASP – vormals Schweizerische Arbeitsgemeinschaft für Sportpsychologie) ihr 50-jähriges bestehen.

den wenigen in der Literatur anzutreffenden bisherigen Überlegungen geht oft vergessen, dass die psychologischen Anforderungen an einen Sportler oder eine Sportlerin nicht nur die Leistungserbringung im Wettkampf betreffen, sondern auch den langwierigen Trainingsprozess, den es braucht um sich die Kompetenz zu erarbeiten überhaupt auf dem erforderlichen Niveau Wettkämpfe zu betreiben. Ericsson und Kollegen (1993) formulierten eine Faustregel, wonach es 10 Jahre Training oder 10'000 Trainingsstunden benötigt, um zu einem Spitzenkönner in seinem Fach heranzuwachsen. Dies zeigt schon, dass es für diesen langwierigen Trainingsprozess wohl auch gewisse Eigenschaften braucht, um zu reüssieren. Nebst vereinzelten Arbeiten zu Anforderungen in wenigen Sportarten und einem Model von Schnabel (Schnabel, Harre, & Krug, 2008) gibt es kaum Erkenntnisse und weiterführende Überlegungen zu den psychischen Anforderungen im Hochleistungssport. Inhalte von psychologischen Trainingsformen stammten historisch gesehen aus Überlegungen zu Verhaltensänderungen des Menschen und waren demnach an therapeutische Erkenntnisse oder einzelnen Befunden zu Nutzenaspekten einzelner psychologischer Techniken angelehnt.

1.2 Psychologisches Training

Der Mensch kommt als ein Mangelwesen auf die Welt. Ohne die Fürsorge der Eltern ist ein Säugling nicht fähig zu überleben. Nicht nur das - viele Formen des menschlichen Verhaltens sind lediglich auf Grund von Lernprozessen, welche teilweise über mehrere Jahre andauern, möglich. Die im Westen entstandene Psychologie als wissenschaftliche Disziplin ist stark durch die jahrhundertelange westliche philosophische und kulturelle Tradition bestimmt. In der westlichen Philosophie hat sich schon früh eine Vorstellung durchgesetzt, wonach es eine Trennung von körperlichen und geistigen Prozessen gibt. In dieser Vorstellung innewohnend ist auch die Vorstellung, dass Körper und Geist unabhängig voneinander trainiert werden können. Albert Ellis, einer der Begründer der klassischen kognitiven Verhaltenstherapie bezog sich in der Entwicklung seines Zugangs auf stoische und rationalistische philosophische Tradition (Robertson, 2010). Die Grundsätze der kognitiven Therapie von Aaron T. Beck sind ebenfalls in der rationalistischen Philosophie verankert, welche die Welt und den Menschen in ihr durch rationale, logische und generell einfach nachvollziehbare Erkenntnisse erklärt (Dryden, David, & Ellis, 2010).

Dieser Logik folgend beruhen angenommene Veränderungsmechanismen des menschlichen Verhaltens in kognitiv orientierten Schulen auch auf einfachen linearen Zusammenhängen: Ursache von dysfunktionalem Verhalten sind negative oder dysfunktionale Kognitionen. Die Modifikation von negativen oder dysfunktionalen

Kognitionen durch Methoden wie kognitive Restrukturierung führt direkt zu veränderten affektiven Zuständen, welche wiederum in adaptiven Verhaltensformen resultieren. Wenn beispielsweise Gedanken wie «Gegen dieses Team können wir nie gewinnen. So werden wir die Qualifikation nicht schaffen.» verändert werden, so wird auch der resultierende affektive Zustand in Form von Angst reduziert werden und das Verhalten «optimal spielen ohne die negativen Auswirkungen von Angst» wird sich einstellen.

Aus dieser Tradition hat sich in der Sportpsychologie auch die Vorstellung von psychologischem Training entwickelt. Sportpsychologen differenzieren zwischen psychologischen Fertigkeiten (Psychological Skills Training)[2] als vorteilhafte Fähigkeiten oder Kompetenzen (z.B. Selbstvertrauen, Aufmerksamkeitsfokus) und psychologischen Techniken oder Methoden um diese Fertigkeiten aufzubauen oder zu stärken (Seiler & Stock, 1994; Vealey, 2007). Das Erlernen und vor allem die Anwendung dieser Techniken – im Sportkonzept ist es naheliegend in diesem Zusammenhang das Wort Training zu verwenden – führt zu einer Verbesserung dieser Fertigkeiten und damit auch einer Verbesserung des potenziellen Handlungsrepertoires der Sport treibenden Person. Dies wiederum sollte zu einer verbesserten Performanz führen.

Die meisten der in der Sportpsychologie verwendeten Techniken stammen ursprünglich aus der kognitiven Verhaltenstherapie, weshalb klassisches mentales Training als Verwandter der kognitiven Verhaltenstherapie betrachtet werden kann. Funktionales Verhalten wird durch die Veränderung von Kognitionen und damit auch Emotionen erreicht (z.B. eine Angstreaktion als spezifisches Verhalten wird durch eine Entspannungsreaktion ersetzt). Diese Vorstellung beruht auf einem linearen mechanistischen Verhaltensmodell: Wenn Kognitionen verändert werden, verändern sich auch Emotionen und damit auch dementsprechend das Verhalten. Deshalb ist es das primäre Ziel von psychologischem Training die Selbstkontrolle von internen psychischen Prozessen des Individuums durch die Anwendung von spezifischen Techniken. Dazu schlagen Seiler und Stock (1994) eine ganze Reihe von möglichen Techniken und Methoden vor. Aus dieser Vielzahl von möglichen Techniken finden sich in der Literatur hauptsächlich vier mentale Grundtechniken des psychologischen Trainings (Vealey, 2007), nämlich Selbstgesprächsregulation, Visualisierung, Zielsetzungstechniken und Erregungsregulation. In der Folge soll durch die Diskussion der unterschiedlichen Wellen der Verhaltenstherapie noch einmal vertiefter in die

[2] Heutzutage würde man vielleicht passender von Kompetenzen sprechen.

sich über die Zeit veränderten Vorstellungen über Prozesse der Verhaltensmodifikation eingegangen werden.

1.3 Die Wellen der Verhaltenstherapie

Obwohl es innerhalb der kognitiven Verhaltenstherapie eine grosse Anzahl unterschiedlicher Interventionen und Ansätze gibt, so scheinen doch nach Dobson und Dozois (2010) drei grundlegende Annahmen allen Ansätzen gemein zu sein. Der erste Ansatz betrifft die Vorstellung, dass kognitive Aktivität oder deren Veränderung Stimmungen und Verhalten beeinflusst. Der zweite Ansatz beinhaltet die Vorstellung, dass kognitive Aktivität kontrolliert und verändert werden kann. Der dritte Ansatz geht von der bereits erwähnten Idee aus, dass eine erwünschte Verhaltensänderung durch die Veränderung der dem Verhalten zu Grunde liegenden Kognitionen ermöglicht wird. Diese drei Vorstellungen sind mit einer zentralen Annahme der kognitiven Verhaltenstherapie übereinstimmend, nämlich, dass psychische Gesundheit oder funktionales Verhalten gesteigert werden kann, indem eine Übereinstimmung zwischen den Gedanken eines Menschen und der externen Realität geschaffen wird. Anders ausgedrückt: Die Reduktion von maladaptivem Denken führt zu erwünschten affektiven Veränderungen und zu funktionalen Verhaltensveränderungen und erhöhter psychischer Gesundheit.

Die meisten Menschen haben jedoch erfahren, dass eine angestrebte Verhaltensänderung nicht so einfach durch eine Veränderung der Gedanken möglich ist. Zudem ist eine sportliche Leistung durch eine Vielzahl von unterschiedlichen Faktoren bestimmt. In der Tat haben viele Menschen bereits die Erfahrung gemacht, dass je mehr sie versuchen nicht an etwas zu denken, desto mehr sie genau mit diesem zu vermeidenden Gedanken konfrontiert werden. In der Literatur findet man die Beschreibung dieses Phänomens unter dem Begriff «Ironic Mental Processes» (Wegner, 1994).

Die Erfahrung, dass verhaltensregulierende Kontrollversuche über die Veränderung von Kognitionen nicht immer zielführend sind, führte zu einer Reihe von Therapieansätzen, welche eine Verhaltensänderung nicht über die Veränderung des inneren Erlebens in Form von Gedanken und Gefühlen anstrebte, sondern über die Akzeptanz dieses inneren Erlebens (Heidenreich, Michalak, & Eifert, 2007). Diese Akzeptanz ist eng verbunden mit Achtsamkeit.

Steven C. Hayes (2004) verwendete für die Therapieansätze, die klassische kognitive Verhaltenstherapien um Achtsamkeit und Akzeptanz bezüglich innerem Erlebens erweitern, die Bezeichnung *Dritte Welle der Verhaltenstherapie*. Als *Erste Welle der Verhaltenstherapie* wird die behaviorale Phase bezeichnet, dessen Einführung auf die 50-er Jahre des vorigen Jahrhunderts datiert wird. Kennzeichnend für die erste Welle der Verhaltenstherapie war die Kritik an mangelnder theoretischer und empirischer Fundierung bisheriger Schulen (z.B. Psychoanalyse), eine Konzentration auf Symptome und deren Veränderung (Verhaltensveränderung), sowie die primäre Orientierung an lerntheoretischen Prinzipien wie klassische und operante Konditionierung (A. M. Hayes & Feldman, 2004; Heidenreich, et al., 2007). Erste-Welle-Verfahren werden im psychologischen Training verbreitet angewendet, indem beispielsweise Wettkampfangst durch Entspannungstechniken bekämpft wird.

Als *Zweite Welle der Verhaltenstherapie* wird die kognitiv-behaviorale Phase bezeichnet. In den 60-er und 70-er Jahren mehrte sich die Überzeugung, dass viele Formen von psychischen Fehlfunktionen mit klassischen Lerntheorien nicht erklärt werden konnten und hierbei Gedanken und Einstellungen eine wichtige Rolle zu spielen schienen (Heidenreich, et al., 2007). Ziel des therapeutischen Prozesses war es dem Patienten seine individuelle Verknüpfung zwischen verzerrtem Denken und nicht zielführendem Verhalten aufzuzeigen, um daraufhin das verzerrte Denken zu verändern. Wie oben bereits ausgeführt wird diese Form von Verfahren im psychologischen Training häufig eingesetzt. Beispielsweise kann die systematische Anwendung von Selbstgesprächen und Selbstgesprächsregulation als Versuch angesehen werden, Verhalten über die Veränderung von Gedanken zu bewirken.

Bei der Diskussion der drei Wellen der Verhaltenstherapie ist es wichtig zu verstehen, dass Vertreter der dritten Welle auf bewährte Verfahren der ersten beiden Wellen aufbauen (S. C. Hayes, 2004). Die Idee dahinter ist recht simpel. Was funktioniert wird beibehalten. Was nicht funktioniert wird in der Therapie nicht mehr angewendet und durch andere Methoden ersetzt. Zudem orientieren sich therapeutische Ansätze der dritten Welle weiterhin an (grundlagen-) wissenschaftlicher Fundierung und empirischer Validierung. Daneben werden kontextuelle und experientielle Anteile stärker gewichtet und die Therapeuten-Patienten Beziehung wird dahingehend gesehen, als dass der Patient als Experte seiner selbst betrachtet wird und es grundsätzlich im Hinblick auf Erleben von Leiden, sowie die durch Verstrickungen mit der Sprache verursachten Probleme keine Unterschiede zwischen beiden gibt (Michalak, Heidenreich, & Bohus, 2006). Entscheidend ist jedoch, dass der

Veränderungsfokus weg geht vom Versuch Gedanken und Gefühle zu verändern, sondern hin zu Achtsamkeit und Akzeptanz von schwer kontrollierbarem inneren Erleben. Das führt dazu, dass das Individuum weniger Energie in die Vermeidung von solchen inneren Erlebnissen steckt, und damit frei ist um das Verhalten in die Verfolgung von wichtigen Zielen und Werten zu lenken.

1.4 Psychologische Inhibitoren von sportlicher Leistung

Die sportliche Leistungserbringung kann durch gewisse psychologische Prozesse, sogenannte Inhibitoren, beeinträchtigt werden. Diese Inhibitoren sind mit den Anforderungen an die sportliche Leistungserbringung eng verbunden. In der sportpsychologischen Literatur findet sich in diesem Zusammenhang auch der Ausdruck *Choking* oder *Choking under Pressure.* Unter *Choking* wird eine suboptimale Leistung unter Drucksituation verstanden (D. M. Hill, Hanton, Fleming, & Matthews, 2009). Mit *Choking* sind demnach auch Inhibitoren sportlicher Leistungserbringung verbunden. Nach Hill und Kollegen (2009) tritt *Choking* in Situationen auf, welche (a) für Athleten als besonders wichtig angesehen werden und sie dementsprechend nach Erfolg streben, wenn (b) eine Art Stressreaktion vorliegt, (c) dem betroffenen Athleten gewisse mentale Attribute fehlen (z.B. Selbstvertrauen) und (d) der Athlet negative psychologische Affekte erlebt. Ziel von sportpsychologischen Interventionen ist es oft dieses *Choking* mit präventiven Massnahmen zu verhindern. Aus der oben genannten Charakterisierung von *Choking* geht hervor, dass *Choking* mit motivationalen Zielen zu tun hat. Grawe (1998) propagiert, dass wenn eine Situation hinsichtlich motivationaler Ziele subjektiv als bedeutsam wahrgenommen wird, jeweils Emotionen entstehen. Falls die Situationswahrnehmung mit der Zielerreichung kongruent ist, resultieren angenehme Emotionen, falls eine Diskrepanz besteht, resultieren unangenehme Gefühle. Tatsächlich finden sich in der Literatur eine Anzahl von Faktoren, die als Inhibitoren von sportlicher Leistung angesehen werden, welche mit Zielen und Emotionen zu tun haben. Diese sind beispielsweise unrealistische Erwartungen aufgrund von einer perfektionistischen Persönlichkeit (A. P. Hill, Hall, Duda, & Appleton, 2011), Wettkampfangst (Hardy, Jones, & Gould, 1996), Ärger oder andere negative Emotionen (Hanin, 2000) oder ganz einfach Vermeidungsverhalten (Jordet & Hartman, 2008).

Die Wahrnehmung von einer Zieldiskrepanz und negativen Gefühlen wird oft mit erhöhten Selbstregulationsbemühungen beantwortet. *Choking* Phänomene werden interessanterweise oft mit erhöhten Selbstregulationsbemühungen erklärt (Beilock & Gray, 2007). Selbstregulationsbemühungen, welche mit der bewussten Kontrolle von Bewegungen

verbunden sind, werden unter dem Begriff *Reinvestment* zusammengefasst (Masters, 1992). *Reinvestment* führt dazu, dass automatisierte Bewegungen verschlechtert werden, wenn eine Person versucht diese bewusst mit deklarativem Wissen zu kontrollieren (Masters & Maxwell, 2008).

Die phylogenetische Weiterentwicklung des menschlichen Gehirns ist zudem mit Vor- und Nachteilen verbunden (P. Gilbert, 2011). Einer dieser Entwicklungen ist, dass unser Bewusstsein die Fähigkeit hat von der Gegenwart, dem Hier-und-Jetzt, in die Zukunft abschweifen zu können, indem es sich zukünftige Ereignisse vorstellt, oder sich auch in die Vergangenheit zurückversetzen kann, indem es sich vergangene Ereignisse aus dem Gedächtnis ins Bewusstsein holt. Dies hat den Vorteil, dass Sportler über vergangene Rennen reflektieren und diese analysieren können. Damit können sie auch zukünftige Handlungen planen. Sie nutzen dies teilweise auch bewusst, indem sie sich Bewegungen und Situationen mit allen Sinnen vorstellen. Sie visualisieren.

Unser Vorstellungsvermögen kann sich jedoch auch vorstellen, was alles schiefgehen könnte. Dann nämlich, wenn es sich zukünftige Ereignisse vorstellt um zu Elaborieren, wie dies ausgehen könnte. In diesem Zusammenhang wird von *affective forecasting* oder *pre-emotion* gesprochen (D. T. Gilbert & Wilson, 2009). Es werden sozusagen emotionale Vorerlebnisse kreiert, in welchen die Emotionen, die durch das zukünftige Handeln ausgelöst werden könnten, vorerlebt werden. Diese Prozesse sind systematischen Fehlern unterworfen (D. T. Gilbert & Wilson, 2007). Bei der Vorstellung von einem positiven Ausgang und damit auch angenehmen Pre-Emotion ist das nicht problematisch. Es werden Verhaltensweisen priorisiert, welche Annäherungsverhalten auslösen. Anders sieht es jedoch aus, wenn man sich einen möglichen schlechten Ausgang vorstellt. Dies führt zu entsprechenden unangenehmen Pre-Emotions und dementsprechend wird Vermeidungsverhalten priorisiert. Grübeln oder Sich-Sorgen ist eine mögliche Konsequenz. Grübeln ist ein Versuch die erlebte Inkongruenz durch rationalisieren wett zu machen. Grübeln bedeutet sich intensiv mit den Ursachen und Konsequenzen von internen oder externen, vergangenen oder zukünftigen Ereignissen zu beschäftigen (Nolen-Hoeksema, 1991). Sich-Sorgen bedeutet sich mit möglichen angstauslösenden Ereignissen in der Zukunft zu beschäftigen um Verhaltensmöglichkeiten vorzubereiten, wie etwa mögliche negative Konsequenzen zu vermeiden wären (Borkovec, 2002). Durch die Beschäftigung mit möglichen Ursachen oder Konsequenzen führt Grübeln und Sich-Sorgen möglicherweise zu einem Erleben von Kontrolle. Dies führt zu einer Spannungsreduktion, wodurch die gewählten Strategien

(Grübeln oder Sich-Sorgen machen) negativ verstärkt werden (Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008). Das erhöht die Wahrscheinlichkeit, dass diese Strategien in ähnlichen zukünftigen Situationen wieder angewendet werden. Paradoxerweise sind jedoch Grübeln und Sich-Sorgen machen ungünstige Formen um adaptive Verhaltensweisen zu begünstigen und können sogar die Entstehung psychischer Fehlanpassungen unterstützen (Watkins, 2008). Eine für die Leistungserbringung im Sport wichtige negative Auswirkung von Grübeln und Sich-Sorgen machen ist die kognitive Interferenz. Als kognitive Interferenz wird die Störung der Konzentration durch aufgabenirrelevante Gedanken oder die Beschäftigung mit unangenehmen Emotionen während der Leistungserbringung bezeichnet (Sarason, Sarason, & Pierce, 1990). Eine Möglichkeit mit störenden Gedanken umzugehen ist der Versuch diese zu vermeiden, indem man versucht diese zu verdrängen oder an etwas Anderes zu denken. Dies kann jedoch, wie bereits berichtet, zu «ironic mental processes» führen (Janelle, 1999) und damit auch gerade gegenteilige Effekte haben. Eine andere mögliche Form um kognitive Interferenz zu reduzieren ist der gezielte Einsatz von gewissen Formen von Selbstgesprächen (Latinjak, Hatzigeorgiadis, & Zourbanos, 2017; Van Raalte, Vincent, & Brewer, 2016)

Das oben erwähnte Erleben von Kontrolle ist als ein mächtiger Verstärker in der menschlichen Verhaltensregulierung zu verstehen. Nach Grawe (2004) ist das Bedürfnis nach Kontrolle und Orientierung eines von vier psychologischen Grundbedürfnissen. Die weiteren psychologischen Grundbedürfnisse sind das Bedürfnis nach Lustgewinn und Vermeidung von Unlust/Schmerzen, das Bedürfnis nach Selbstwerterhöhung/ Selbstwertschutz und das Bedürfnis nach Bindung. Um zu erklären wie Verhalten durch Erfahrung reguliert wird postuliert Grawe das Konzept von motivationalen Schemas mit deren neurologischen Korrelaten. In Abhängigkeit von der persönlichen Erfahrung und seiner Umwelt wird ein Individuum annähernde oder vermeidende motivationale Schemas entwickeln. Diese dienen dem kurzfristigen Schutz der psychologischen Grundbedürfnisse. Motivationale Schemas sind relativ stark und können scheinbar nicht rationales Verhalten erklären. Zudem kann die Befriedigung eines der vier psychologischen Grundbedürfnisse die Befriedigung eines anderen psychologischen Grundbedürfnisses verletzen. In derselben Situation können nämlich zwei unterschiedliche motivationale Schemas mit deren korrespondierenden neuronalen Korrelaten aktiviert werden. Das führt dazu, dass die betroffene Person Inkonsistenz erlebt. Inkongruenz wird als unangenehm empfunden, weshalb das menschliche System nach Kongruenz strebt. Das Erleben von Inkongruenz führt kurzfristig zu psychologischen Fehlfunktionen, langfristig zu psychischen Störungen. Das Erleben von Inkongruenz kann also auch als ein psychologischer Inhibitor von Leistung angesehen werden.

Gefestigte motivationale Schemas mit den dazugehörigen neurologischen Korrelaten können zudem als eine Art von Persönlichkeitseigenschaften angesehen werden. In der Literatur finden sich tatsächlich auch persönliche Faktoren, welche als Inhibitoren sportlicher Leistung angesehen werden, wie beispielsweise ein vermeidender Bewältigungsstil (Hanson, McCullagh, & Tonymon, 1992), Furcht vor Misserfolg (Elbe, Beckmann, & Szymanski, 2003) oder interne Fehlerattribuierung (Biddle, Hanrahan, & Sellars, 2001).

Zusätzlich finden sich in der Literatur auch Hinweise, dass Umweltfaktoren als Inhibitoren von Sportlicher Leistung auftreten können, ganz im Sinne von McCann (2008), dass an Grossanlässen, wie den Olympischen Spielen, alle mögliche Faktoren, wie etwa interpersonelle Probleme oder Lebensbalanceschwierigkeiten (Hardy, et al., 1996), zu leistungsbeeinflussenden Faktoren werden.

Zusammenfassend können Inhibitoren sportlicher Leistung oder funktionalem Verhalten in vier Hauptkategorien eingeteilt werden, welche mit (a) den Leistungserwartungen des Individuums, (b) der Emotionsregulation, (c) motivationalen Schemata im Zusammenhang mit Zielverfolgung und der Befriedigung der psychologischen Grundbedürfnisse und (d) dem adaptiven Umgang mit Umweltfaktoren zu tun haben. Es kann angenommen werden, dass Verfahren, welche es ermöglichen mit den Leistungserwartungen des Individuums adaptiv umzugehen, die Emotionen adaptiv zu regulieren, adaptive motivationale Schemata anzuwenden und maladaptive Schemata zu unterbinden sowie einen adaptiven Umgang mit Umweltfaktoren zu begünstigen, Sportlern helfen die Anforderungen an ihre Sportart besser zu bewältigen. Als adaptiv werden in diesem Zusammenhang Verhaltensweisen bezeichnet, welche zum Erreichen motivationaler Annäherungsziele beitragen. Maladaptiv sind Verhaltensweisen, welche zu Vermeidungszielen führen oder verhindern, dass Annäherungsziele erreicht werden. Hier ist auch denkbar, dass je nach Situation ein und dasselbe Ziel in der einen Situation adaptiv und in einer anderen Situation maladaptiv sein kann.

1.5 Psychologische Förderer sportlicher Leistung

Psychologische Faktoren sind jedoch nicht nur als Hemmer einer Leistungserbringung zu sehen, sondern können im Gegenteil auch eine Leistungserbringung unterstützen. Lew Hardy ist der Meinung, dass die Erbringung von Höchstleistungen von automatischen zielfokussierten Prozessen profitiert (Hardy, et al., 1996). Sich auf für die Leistungserbringung relevanten Aspekte zu fokussieren ist zentral für das Abrufen einer

sportlichen Leistung (Moran, 2009). Peter Haberl spricht dabei von der Aufmerksamkeit als Währung des sportlichen Erfolgs (Kamphoff, 2019). Es gibt Befunde, welche Achtsamkeit und Akzeptanz mit erfolgreicher sportlicher Leistung in Verbindung bringen (Bühlmayer, Birrer, Röthlin, Faude, & Donath, 2017; Sappington & Longshore, 2015), wobei die Befunde auch kontrovers diskutiert werden (Noetel, Ciarrochi, Van Zanden, & Lonsdale, 2017). Unter Achtsamkeit wird eine spezifische Form der Aufmerksamkeit verstanden, welche das Bewusstsein in einer offenen, akzeptierenden und wertfreien Art auf die Wahrnehmung des gegenwärtigen Augenblicks lenkt (Kabat-Zinn, 2011). Achtsamkeit kann dabei als eine spezielle Form von mentalem Training verstanden werden, nämlich ein Training in welchem man übt die Wahrnehmung auf den gegenwärtigen Augenblick zu lenken und zwar mit einer spezifischen Haltung, welche von Wertfreiheit, Akzeptanz und Offenheit gegenüber innerem und äusserem Erleben geprägt ist. Bei der zweiten Form von Achtsamkeit wird von Zustandsachtsamkeit (State) gesprochen, nämlich im gegenwärtigen Moment mit dem Bewusstsein im Hier und Jetzt zu sein. Die dritte Form von Achtsamkeit wird als Persönlichkeitseigenschaft (Trait) konzeptualisiert und dispositionelle Achtsamkeit genannt. Diese beschreibt das Persönlichkeitsmerkmal oder die generelle Tendenz im Alltag achtsam zu sein. Achtsamkeitstraining beschreibt das bewusste und gewollte Herbeiführen und Aufrechterhalten eines achtsamen Zustandes. Zumeist geschieht dies durch eine Form von Meditation, kann jedoch auch durch informelle Übungen im Alltag geschehen. Birrer und Röthlin (2017) sprechen von drei wichtigen Achtsamkeitsprozessen, welche auch als mögliche Wirkmechanismen angesehen werden, nämlich gegenwärtige absichtsvolle Bewusstheit, metakognitive Bewusstheit und Akzeptanz.

Zusammenfassend kann die Fähigkeit mit dem Bewusstsein im Hier-und Jetzt zu sein und zwar in einer akzeptierenden nicht-wertenden Art und Weise, welches das Abrufen von automatisierten zielführenden Prozessen begünstigt, als leistungsbegünstigend betrachtet werden. Sportlern zu helfen möglichst in einen solchen Zustand zu gelangen kann als adaptive Form der Verhaltensregulation angeschaut werden. Mentale Strategien, welche dies begünstigen können also auch als Strategien betrachtet werden, welche es Sportlern ermöglichen sollte, die psychischen Anforderungen in der Leistungserbringung zu bewältigen.

2 Zusammenfassung der Publikationen

Im folgenden Abschnitt werden die für die vorliegende Dissertation relevanten fünf Publikationen in zusammengefasster Form wiedergegeben:

Publikation 1:

Birrer, D., & Morgan, G. (2010). Psychological skills training as a way to enhance an athlete's performance in high-intensity sports. *Scandinavian Journal of Medicine & Science in Sports, 20*, 78–87. doi: 10.1111/j.1600-0838.2010.01188.x

Publikation 2:

Birrer, D., Wetzel, J., Schmid, J., & Morgan, G. (2012). Analysis of sport psychology consultancy at three Olympic Games: Facts and figures. *Psychology of Sport and Exercise, 13*(5), 702-710. doi: 10.1016/j.psychsport.2012.04.008

Publikation 3:

Birrer, D., Röthlin, P., & Morgan, G. (2012). Mindfulness to enhance athletic performance: Theoretical considerations and possible impact mechanisms. *Mindfulness, 3*(3), 235–246. doi: 10.1007/s12671-012-0109-2

Publikation 4:

Röthlin, P., Horvath, S., Birrer, D., & grosse Holtforth, M. (2016). Mindfulness promotes the ability to deliver performance in highly demanding situations. *Mindfulness, 7*(3), 727-733. doi: 10.1007/s12671-016-0512-1

Publikation 5:

Birrer, D. (2019). Rowing Over the Edge – Non-Functional Overreaching and Overtraining Syndrome as Maladjustment: Diagnosis and Treatment under a Psychological Perspective – A Case Study. *Case Studies in Sport and Exercise Psychology*. doi: 10.1123/cssep.2019-0006

Die Zusammenfassungen sind jeweils gegliedert in *Ziel und Fragestellung*, *Stichprobe*, *Vorgehen und Datenanalyse* sowie *Resultate*. Die fünf Publikationen haben unterschiedliche Forschungszugänge, weshalb die Beschreibung der Stichprobe und des

Forschungsdesigns nicht immer ganz einfach, bzw. passend war, da sie nur selten dem klassischen Muster empirischer Forschung entsprechen. Bei der ersten Publikation handelt es sich um einen narrativen/ theoretischen Reviewartikel, wobei es um die Frage ging, welche psychologischen Anforderungen in hochintensiven Sportarten mit welchen psychologischen Techniken und Strategien bewältigt werden können.

Bei der zweiten Publikation geht es um eine empirische Erhebung der sportpsychologischen Betreuung der Schweizer Olympiadelegationen der Olympischen Spiele 2006, 2008 und 2010. Sie gibt Aufschluss darüber, mit welchen psychologischen Anforderungen Hochleistungsathleten an einem Megasportevent, wie es Olympische Spiele darstellen, konfrontiert werden.

Bei der dritten Publikation handelt es sich um einen theoretischen Review. In dieser Publikation wird aus einer theoretischen Perspektive beleuchtet, wie Achtsamkeit psychologisches Training im Kontext des Leistungssports ergänzen könnte und welches mögliche Wirkmechanismen zur Leistungsoptimierung sein könnten.

Die vierte Publikation hatte zum Ziel eine dieser möglichen Wirkmechanismen von Achtsamkeit empirisch zu überprüfen. Konkret ging es darum mittels eines ex post facto designs abzuschätzen, ob dispositionelle Achtsamkeit auch in anspruchsvollen Leistungssituationen psychisch angepasstes Funktionieren begünstigt.

Bei der fünften Publikation handelt es sich um eine Fallstudie. Sie erweitert damit den methodischen Fächer der Publikationen, indem sie anhand des Fallbeispiels eines jungen Ruderers spezifische psychische Anforderungen eines Hochleistungsathleten aufzeigt und schildert, mit welchen psychologischen Methoden und Strategien die spezifische Problematik bewältigt werden konnte. Mit dieser Publikation wird sozusagen der Bogen der Dissertation abgerundet, welcher sich von theoretischen Überlegungen ausgehend via eines klassischen empirischen Erkenntnisgewinns zur reflektierten Praxis im Sinne eines *Research Practicioners* spannt.

2.1 Publikation 1: Psychological skills training as a way to enhance an athlete's performance in high-intensity sports [Training psychologischer Fertigkeiten als ein Weg zur Verbesserung der athletischen Leistung in hochintensiven Sportarten]

2.1.1 Ziel der Studie und Fragestellungen

Sport findet in den unterschiedlichsten Ausprägungen und Inszenierungsformen statt. Dabei stellt die Sportart mit ihren spezifischen physischen, technischen und taktischen Anforderungen und dem entsprechenden Regelwerk auch spezifische psychische Herausforderungen an die Sporttreibenden. Hochintensive Sportarten bilden dabei eine spezielle Kategorie von Sportarten, welche durch eine Wettkampf-Belastungsdauer von 1-8 Minuten, einer kontinuierlichen Leistungserbringung über die gesamte Belastungszeit und einer hochintensiven (maximalen) Belastung über die gesamte Wettkampfdauer gekennzeichnet ist. Das Ziel der ersten Arbeit war es die spezifischen psychischen Anforderungen zur Meisterung von hochintensiven Sportarten zu ermitteln, Strategien zu deren Bewältigung zu eruieren und Ansätze zu deren Training zu skizzieren. Folgende Fragen sollten dabei beantwortet werden: Was sind psychische Anforderungen in hochintensiven Sportarten? Welche Fertigkeiten werden benötigt um diese Anforderungen bewältigen zu können und mit welchen Methoden können diese Fertigkeiten systematisch gefördert werden? Da hochintensive Sportarten eine breite Palette von Sportarten (z.B. Schwimmen, Rudern, 800m Lauf) beinhalten wurde zur Beantwortung der Fragestellung der Weg des narrativen Reviews gewählt.

2.1.2 Stichprobe

Es wurde eine systematische Literaturrecherche mit den Suchmaschinen PsycINFO, Psyndex plus, SPORTDiscus und den Suchbegriffen «Psychological skills training» oder ‘‘PST,’’ ‘‘Mental skills training’’ or ‘‘High intensity sport’’ oder «HIS» durchgeführt. Diese Suche wurde mit typischen HIS-Sportarten als Suchbegriff an Stelle von “HIS” erweitert. Zusätzlich wurde das Buch “Clinical Sport Psychology” von Gardner und Moore (2006) sowie die Zeitschriften Psychology of Sport and Exercise, The Sport Psychologist, Journal of Applied Sport Psychology, International Journal of Sport and Exercise Psychology und das Journal of Exercise and Sport Psychology der Jahre 2000-2009 nach entsprechenden Beiträgen “von Hand” durchsucht. Zudem wurde die Literaturliste der gefundenen Artikel nach entsprechenden Beiträgen durchsucht.

2.1.3 Vorgehen und Datenanalyse

Arbeit 1 wurde als narrativer Review geplant. Die gefundenen Literaturquellen wurden nach relevanten Informationen zur Beantwortung der Fragestellung gescannt. Aufgrund der fehlenden empirischen Studien zu hochintensiven Sportarten, entwickelte sich aus dem geplanten narrativen Review ein theoretischer Review, da eine vorläufige Beantwortung der Fragestellung weitestgehend nur durch eine theoretische Herleitung möglich war.

2.1.4 Resultate

Die Literatursuche ergab lediglich sechs Studien, welche den Einschlusskriterien entsprachen. Fünf Studien wurden bereits in der Gardner und Moore (2006) Analyse einbezogen. Keine der Studien hatte ein *randomized controlled design* oder ein Einzelfallstudiendesign mit Interventionsvergleichen. Aufgrund des mangelhaften Literaturstandes wurde beschlossen die psychischen Anforderungen an HIS Sportler, die benötigten Fertigkeiten zu deren Bewältigung und geeignete Methoden zu dessen Aufbau aus theoretischen Überlegungen abzuleiten. Dazu wurde ein bestehendes Modell von Schnabel und Kollegen (2008) erweitert. Die vorgenommene Analyse mit besagtem Modell ergab für HIS Sportarten Selbst-Fertigkeiten, Fertigkeiten zur persönlichen Entwicklung, Lebenskompetenzen, Fertigkeiten zur Erregungsregulation, volitionale Fertigkeiten, Fertigkeiten zur Schmerzbewältigung, assoziative und dissoziative Aufmerksamkeitsregulation und Fertigkeiten zur Erholungsförderung als wichtige Skills zur Bewältigung der Anforderungen an HIS. Die vorgeschlagenen Methoden zur Förderung dieser Fertigkeiten sollten Athletinnen und Athleten unterstützen hart zu trainieren, im Wettstreit trotz hohen Schmerzen und Frustration konsequent zu handeln, strategische Pläne zu verfolgen, raffiniert anzupassen und Entscheidungen zu treffen, sowie sich um das eigene Selbst zu kümmern.

2.1.5 Research Impact

Mit Stichdatum 15. Juli 2019 wurde der Artikel auf der Plattform Researchgate (Researchgate, ca. 2011) 10'908-mal angesehen. Davon waren 6669 Volltextlesungen, bzw. Downloads. Der Artikel wurde gemäss Researchgate bis zu diesem Zeitpunkt 104-mal zitiert.

2.2 Publikation 2: Analysis of sport psychology consultancy at three Olympic Games: Facts and figures. [Analyse der sportpsychologischen Beratung an drei Olympischen Spielen: Fakten und Zahlen]

2.2.1 Ziel der Studie und Fragestellungen

Seit Jahren kann beobachtet werden, dass die Anzahl der Sportpsychologinnen und Sportpsychologen, welche an Olympischen Spielen in die Vorortbetreuung von Athleten/ Athletinnen und Trainern/ Trainerinnen involviert sind, zunehmend ist. Trotz der anwachsenden Vorortbetreuung stammte das Wissen über eine sinnvolle Vorortbetreuung bis dato aus (a) Forschung zu Stress und deren Bewältigungsstrategien im Sport, (b) Erhebungen zum Erleben der Olympischen Spiele von Athleten und Trainern sowie (c) best-practise Berichten über die Vorortbetreuung an Olympischen Spielen. Deshalb war es das Ziel der zweiten Studie systematisches Wissen über die Vororttätigkeit eines praktisch tätigen Sportpsychologen zu generieren. Folgende Fragen sollten dabei exemplarisch beantwortet werden: Welches sind Interventionsthemen, Interventionsformen, Klientengruppen und Interventionshäufigkeiten bei sportpsychologischen Dienstleistungen an olympischen Spielen? Zusätzlich sollte auch der Frage nachgegangen werden, wie eine vorhergehende Zusammenarbeit zwischen Sportler und Sportpsychologe die Nachfrage sportpsychologischer Dienstleistungen beeinflusst.

2.2.2 Stichprobe

Die Stichprobe bestand aus den akkreditierten Athleten und Trainer der Schweizer Delegationen der Olympischen Spiele 2006, 2008 und 2010 (n = 130 akkreditierte Athleten 2006; n = 161 Athleten, Trainer und weitere akkreditierte Delegationsmitglieder 2008; n = 284 Athleten, Trainer und weitere akkreditierte Delegationsmitglieder 2010). Je nach Betrachtungsweise kann die Studie auch als Einzelfallanalyse angesehen werden, da nämlich die Interventionen einer einzelnen Person, nämlich des offiziellen Sportpsychologen der Schweizer Olympiadelegationen 2006, 2008, und 2010, untersucht wurden.

2.2.3 Vorgehen und Datenanalyse

Der offizielle Sportpsychologe der jeweiligen Olympischen Spiele führte Tagebuch betreffend täglichen Sitzungen, Interventionen und allgemeinen Geschehnissen. Zu einem späteren Zeitpunkt wurden alle Begegnungen mit Interventionscharakter, welche länger als 15 Minuten dauerten, in eine Excel Liste übertragen. In dieser Liste wurde jede Intervention als formell (geplant) oder informell (ungeplant aus der Situation entstehend) kategorisiert.

Zusätzlich wurden der Name der Klienten, Geschlecht, Sportart, und Interventionsthema erfasst.

Die Tagesrapporte wurden einer weiteren Analyse unterzogen und die Interventionsthemen wurden zu 31 Interventionskategorien zugeordnet. Die Kategorien wurden aus der Literatur zu Erfolgs- und Misserfolgsfaktoren an Olympischen Spielen (Schmid, 2005a, 2005b) sowie Praxisberichten von an Olympischen Spielen tätigen Sportpsychologen und Forschung zu Stressoren an Grossanlässen (Hodge, 2010; McCann, 2008; Mellalieu, Neil, Hanton, & Fletcher, 2009) hergeleitet. Unter Verwendung von Literatur/ Rahmenmodellen zu organisationalem Stress (Fletcher & Hanton, 2003; Hanton, Fletcher, & Coughlan, 2005; Mellalieu, et al., 2009) wurden diese 31 Grundthemen zu 15 Kategorien höherer Ordnung und in einem weiteren Schritt vier Kategorien erster Ordnung zugewiesen. Diese vier Kategorien waren: (1) "Generelle Leistungsthemen" (wettkampfbezogene Stressoren, welche direkt mit der Wettkampfleistung verbunden sind), (2) "Spezifische Olympische Wettkampfthemen" (wettkampfbezogene Stressoren, welche mit der Einzigartigkeit des Olympischen Wettkampfes verbunden sind), (3) "Organisationale Themen" (organisationale Stressoren, welche mit der sportlichen Umgebung des Athleten verbunden sind) und (4) "Persönliche Themen" (Stressoren, welche direkt mit der Person, ihrer persönlichen Geschichte und/oder dem persönlichen oder privaten Umfeld der Person verbunden sind).

Jede einzelne Intervention wurde als «Fall» in die Datenanalyse einbezogen. Zur Beantwortung der Fragestellung wurden vor allem deskriptive Statistiken verwendet. Auf Grund des kategorialen Charakters der meisten Variablen wurden Chi-Quadrat Verfahren angewendet um Beziehungen zwischen diesen Variablen zu beurteilen. Wo angemessen wurden zusätzlich Odds Ratios berechnet um auch einfach interpretierbare Effektstärken zur Verfügung zu haben.

2.2.4 Resultate

Über die drei in die Analysen einbezogenen Olympischen Spiele betrachtet, beanspruchten zwischen 11 und 25% der Personen der jeweiligen Schweizer Delegationen sportpsychologische Dienstleistungen. Im Durchschnitt führte der Sportpsychologe zwischen 2.1 und 4.6 Interventionen pro Tag durch. Rund 50% der Interventionen waren formal und geplant, bzw. informell und ungeplant. Etwa 30% der Interventionen wurden von Trainern in Anspruch genommen. Die meisten Interventionen betrafen *Generelle Leistungsthemen*,

gefolgt von *Organisationalen Themen* und *Persönlichen Themen*. Bei den generellen Leistungsthemen ging es in erster Linie um *Spezifische mentale Wettkampfvorbereitung*, *Umgang mit Erwartungen und Selbstregulation*. Bei organisationalen Themen waren vor allem *Konflikte innerhalb des Team oder mit dem Trainer* der primäre Interventionsgrund. Im Bereich der persönlichen Ereignisse waren *kritische Ereignisse* relativ häufig vertreten. *Klinische oder subklinische Themen* waren eher selten.

2.2.5 Research Impact

Mit Stichtag 15. Juli 2019 wurde der Artikel gemäss der Plattform Researchgate (Researchgate, ca. 2012) 1’383-mal gelesen. Davon waren 384 Volltextlesungen, bzw. Downloads. Gemäss Researchgate wurde der Artikel 18-mal zitiert.

2.3 Studie 3: Mindfulness to enhance athletic performance: Theoretical considerations and possible impact mechanisms [Achtsamkeit zur Verbesserung der sportlichen Leistung: Theoretische Überlegungen und mögliche Wirkmechanismen]

2.3.1 Ziel der Studie und Fragestellungen

Vor 15 Jahren deklarierte Steven Hayes (2004) die sogenannte dritte Welle der Verhaltenstherapie. Er bezog sich dabei auf eine Reihe von auf Achtsamkeit und Akzeptanz basierenden Therapieformen, welche Veränderungen des Verhaltens nicht durch die primäre Veränderung eines kognitiven Inhalts von Gedanken und Gefühlen zurückführte, sondern auf die Beziehung zu diesen Inhalten. Obwohl einige Sportpsychologen schon zu Beginn dieses Jahrhunderts begannen Achtsamkeit als eine wichtige Intervention in der Arbeit mit Hochleistungsathleten einzusetzen (Haberl, 2007), mangelte es bis dato an Untersuchungen zu Wirkungen von achtsamkeitsbasierten Interventionen im Sport und möglichen Wirkmechanismen. Dieser Artikel behandelt deshalb aus einer theoretischen Perspektive wie Achtsamkeit psychologisches Training im Kontext des Leistungssports ergänzen könnte und welches mögliche Wirkmechanismen zur Leistungsoptimierung sein könnten. Folgende Fragen wurden zu beantworten versucht: Warum sollte Achtsamkeit und Achtsamkeitstraining auch im Kontext des Leistungssports wirken? Was sind mögliche Wirkmechanismen in der Beziehung zwischen Achtsamkeit und sportlicher Leistung?

2.3.2 Vorgehen und Quellenanalyse

In einer Literaturrecherche wurden Quellen zu folgenden Themen gesammelt und systematisch verarbeitet. Welches sind psychische Faktoren, welche eine Leistungserbringung im Leistungssport begünstigen und welches sind Faktoren, welche Leistungserbringung behindern? Welches sind psychische Anforderungen an eine Leistungserbringung im Sport, welche Fertigkeiten könnten helfen diese zu bewältigen und welche psychologischen Techniken könnten geeignet sein um diese Fertigkeiten zu entfalten (Birrer & Morgan, 2010). In einem zweiten Schritt wurden Quellen verarbeitet, welche mögliche Limiten von traditionellen psychologischen Trainingsformen im Sport aufzeigen. Die traditionellen Trainingsformen können weitestgehend der ersten und zweiten Welle der Verhaltenstherapie zugeordnet werden. Daraufhin wurde aufgearbeitet, was Achtsamkeit ist und welche Facetten oder Komponenten von Achtsamkeitstraining und dispositioneller Achtsamkeit zu unterscheiden sind und wie diese mit funktionalem Verhalten in der sportlichen Leistungserbringung in Verbindung stehen. In einem weiteren Schritt wurden aus der Literatur zu Wirkmechanismen von Achtsamkeit mögliche Wirkmechanismen für die

Leistungserbringung im Sport vorgeschlagen. Ein wichtiger Teil der theoretischen Aufarbeitung gehörte einem möglichen Widerspruch, nämlich wie Achtsamkeit, welche ja durch Akzeptanz und Zweckfreiheit gekennzeichnet ist, für Athleten, welche extrem auf Resultate und Gewinnen fokussiert sind, hilfreich angewendet werden kann.

2.3.3 Resultate

Die Unterscheidung in Achtsamkeitstraining und dispositioneller Achtsamkeit ist ein wichtiger Aspekt in der Anwendung des Konzeptes Achtsamkeit im Kontext des Hochleistungssports. Achtsamkeitstraining meint die Methode mit welcher Achtsamkeit kultiviert wird. Dispositionelle Achtsamkeit beschreibt die Tendenz achtsam im Alltag zu sein. In der vorliegenden Konzeptualisierung wurden drei miteinander eng verbundene Facetten von Achtsamkeitstraining unterschieden, nämlich die Absicht warum eine Person Achtsamkeit übt, reine ungeteilte Aufmerksamkeit im Hier und Jetzt und die Einstellungsfacette nicht-wertend, akzeptierend, offen, selbst-respektierend und nicht-reaktiv. Wenn von dispositioneller Achtsamkeit die Rede ist, wurden im vorliegenden dritten Artikel, Bergomi und Kollegen folgend (Bergomi, Kupper, & Tschacher, 2011), die sechs Achtsamkeitskomponenten *Nicht-Reaktivität/Dezentrierung*, *Beobachten/Wahrnehmen*, *Relativierung, Offenheit/Nicht-Vermeidung*, *Bewusstes Handeln* und *Akzeptanz/Selbst-Mitgefühl* unterschieden. Auf Grund der theoretischen Überlegungen wurde gefolgert, dass Athleten, welche achtsamer sind, durch unterschiedliche Wirkmechanismen auch eine vermehrtere Anwendung benötigter psychologischer Fertigkeiten aufweisen. Auf Grund der theoretischen Überlegungen wurden *ungeteilte Aufmerksamkeit*, *Akzeptanz von Erfahrungen*, *Werteklärung*, *Selbstregulation / Emotionsregulation*, *Klarheit über die inneren Empfindungen*, *Exposition*, *Flexibilität*, *Nicht-Klammern* (non-attachment) und *Grübeln* als mögliche Wirkmechanismen identifiziert. Es wird vorgeschlagen, dass ein besseres Verständnis bezüglich der Konzeptualisierung von Achtsamkeit und dessen Wirkung und Beziehung auf und zu psychologischen Fertigkeiten die funktionale Anwendung von achtsamkeitsbasierten Interventionen im Sport verbessern kann. Dazu wird vorgeschlagen mögliche Wirkmechanismen empirisch zu überprüfen.

2.3.4 Ausgelöstes Forschungsinteresse

Mit Stichtag 15. Juli wurde der Artikel auf der Plattform Researchgate (Researchgate, ca. 2013) 13’625-mal gelesen. Davon waren 8’585 Volltextlesungen, bzw. Downloads. Der Artikel wurde zudem gemäss Researchgate 71-mal zitiert. Gemäss der Verlagsseite (Springer

Link, 2012) wurde mit Stichtag 28.07.2019 der Artikel 8'500 heruntergeladen und 45-mal zitiert.

2.4 Publikation 4: Mindfulness promotes the ability to deliver performance in highly demanding situations. [Achtsamkeit fördert die Fähigkeit zur Leistungsausübung in anforderungsreichen Situationen]

2.4.1 Ziel der Studie und Fragestellungen

In Publikation 3 wurde dazu aufgerufen mögliche Wirkmechanismen von Achtsamkeit auf die sportliche Leistung zu überprüfen. Ein möglicher Wirkmechanismus, welcher propagiert wurde, war, dass Achtsamkeit dazu führt, dass ein Sportler fähig ist trotz unangenehmer Emotionen, wie zum Beispiel Wettkampfangst, funktional zu handeln. Dies sollte zudem zu einer generellen Abnahme negativer Emotionen führen. Beides sollte den sportlichen Leistungsabruf begünstigen. Unangenehme Emotionen werden im allgemeinen als Verhinderer sportlicher Leistung angeschaut. Empirische Belege dafür fehlten bisher. Natürlich kann davon ausgegangen werden, dass Angst die sportliche Leistungsfähigkeit durch vermehrte Anstrengung oder erhöhte Aufmerksamkeit auch begünstigen könnte. Es gibt jedoch Befunde, welche zeigen, dass sich Angst gerade in Drucksituationen leistungshinderlich auswirkt (D. M. Hill, Hanton, Matthews, & Fleming, 2010).

Das Ziel der vierten Publikation war es zu überprüfen, ob dispositionelle Achtsamkeit mit der Fähigkeit sportliche Leistung unter Druck abzurufen, einhergeht. Im Weiteren wird ein Modell untersucht, das annimmt, dass dieser Zusammenhang über eine bessere Handlungsfähigkeit unter Wettkampfangst und über eine generelle Abnahme der Wettkampfängstlichkeit erklärt werden kann.

2.4.2 Stichprobe

Die Stichprobe aus Publikation vier umfasst 133 Athletinnen und Athleten aus 23 verschiedenen Sportarten (45.9% männlich, $M_{\text{Alter}} = 23.68$, $SD_{\text{Alter}} = 6.12$, Altersrange 17-53, 30.8% Teamsportarten). Es handelt sich um ein hochkarätiges Sample, haben doch rund 95% der Teilnehmenden die Schweiz schon mindestens einmal an internationalen Wettkämpfen vertreten. 30.8% der Sportler stufen ihr Leistungslevel als weltweit international top, 18.0% als europaweit international top, 48.9% als national top und 2.3% der Studienteilnehmer als tiefer als national top ein. Pro Woche trainierten diese Athletinnen und Athleten im Durchschnitt 14.63 Stunden ($SD = 6.13$). Die am häufigsten vertretenen Sportarten in der Stichprobe sind Rad (13.5%), Unihockey (9.8%), Orientierungslauf (9.8%), Curling (9.8%), Leichtathletik (9.0%), Judo (7.5%), Reiten (5.3%), Handball (5.3%) und Schiessen (4.5%).

2.4.3 Vorgehen und Datenanalyse

Studie 4 ist eine korrelative Studie mit einem Ex-post-facto-Design. In einer Online Befragung wurden Fragebogen zu Eigenschaftsachtsamkeit (Comprehensive Inventory of Mindfulness Experiences (CHIME), Bergomi, Tschacher, & Kupper, 2014) sowie zur kognitiven und somatischen Wettkampfängstlichkeit (Wettkampangstinventar-Trait (WAI-T), Brand, Ehrlenspiel, & Graf, 2009) eingesetzt. Ebenfalls wurde eine subjektive Einschätzung des eigenen Leistungsabrufs in sportlichen Drucksituationen in der der Befragung unmittelbar vorausgehenden Zeit erfasst. Es wurde ein Modell überprüft, welches annimmt, dass der Zusammenhang zwischen Achtsamkeit und der sportlichen Leistung unter Druck über eine Verringerung der Wettkampfangst erklärt wird (Mediation) und dass gleichzeitig der leistungsmindernde Effekt von Wettkampfangst auf den Leistungsabruf von Achtsamkeit abgefedert wird (Moderation). Das heisst, es wurde überprüft ob Athleten mit hoher Achtsamkeit trotz vorhandener Wettkampfangst fähig waren ihre Leistung abzurufen. Die Parameter dieses Modells wurden nach den Vorgaben für eine moderierte Mediation berechnet (A. F. Hayes, 2013).

2.4.4 Resultate

Die durch die Totalskala des CHIME (Bergomi, et al., 2014) gemessene Eigenschaftsachtsamkeit hing mit somatischer und kognitiver Wettkampfängstlichkeit negativ und mit dem selbsteingeschätzten Leistungsabruf in sportlichen Drucksituationen positiv zusammen. Dieser Zusammenhang wird durch kognitive Wettkampfängstlichkeit vollständig mediiert. Das spricht dafür, dass Achtsamkeit den Leistungsabruf unter Druck verbessert, indem auch weniger kognitive Angst wahrgenommen wird. Interessanterweise besteht im Gesamtmodell lediglich ein Zusammenhang zwischen kognitiver Wettkampfangst und der Leistungseinschätzung (je höher die kognitive Wettkampfangst desto geringer die Leistungseinschätzung und umgekehrt) und kein Zusammenhang zwischen somatischer Wettkampfängstlichkeit und dem selbsteingeschätzten Leistungsabruf. Das spricht für eine negative Auswirkung von kognitiver Angst auf die Leistung. Die Beziehung zwischen kognitiver Angst und Leistungsabruf ist für Personen mit hoher Eigenschaftsachtsamkeit weniger stark als für solche mit tiefer Ausprägungen. Das deutet darauf hin, dass achtsame Individuen trotz vorhandener kognitiver Angst, besser fähig sind ihre Leistung abzurufen. Das spricht wiederum dafür nicht gegen kognitive Angst anzukämpfen, sondern diese als normalen menschlichen Prozess zu akzeptieren und die Aufmerksamkeit wertfrei ins Hier und Jetzt zurückzulenken.

2.4.5 Ausgelöstes Forschungsinteresse

Mit Stichtag 15. Juli 2019 wurden auf der Plattform Researchgate (Researchgate, ca. 2016) 867 Reads verzeichnet. Davon waren 451 Volltextlesungen, bzw. Downloads. Gemäss Researchgate wurde der Artikel bisher 14-mal zitiert. Auf der Verlagsseite (Springer Link, 2016) wurde der Artikel mit Stichtag 28.07. 2019 1’900-mal heruntergeladen und 12-mal zitiert.

2.5 Studie 5: Rowing Over the Edge – Non-Functional Overreaching and Overtraining Syndrome as Maladjustment: Diagnosis and Treatment under a Psychological Perspective – A Case Study [Rudern am Abgrund – Nicht-funktionales Overreaching und Übertrainingssyndrom als Fehlanpassung: Diagnose und Behandlung aus psychologischer Perspektive – eine Fallstudie]

2.5.1 Ziel der Studie und Fragestellungen

Spitzenathletinnen und Spitzenathleten haben je nach Anforderungen ihrer Sportart enorme Trainingspensen zu absolvieren. Normalerweise wird die Trainingsplanung so festgelegt, dass die Trainingsbelastungen sich progressiv steigern und mit den positiven Trainingsanpassungen Schritt halten. Manchmal sind Athletinnen und Athleten jedoch nicht in der Lage auf die Trainings mit positiven Leistungsanpassungen zu antworten. Sind diese Fehlanpassungen von grösserem Ausmass und ist der Sportler auch nach einer mindestens 14-tägigen Trainingspause oder Trainingsreduktion von mindestens 20% nicht mehr fähig seine ursprüngliche Leistungsfähigkeit wieder zu erlangen, wird in der sportwissenschaftlichen Literatur von einem nicht-funktionalem Overreaching oder einem Übertrainingssyndrom gesprochen (Meeusen, et al., 2013). Aus einer psychologischen Sichtweise ähneln diese Zustände einer Anpassungsstörung (Zelviene & Kazlauskas, 2018). Aus diesem Grunde wurde vorgeschlagen nicht-funktionales Overreaching und ein Übertrainingssyndrom als Anpassungsstörung zu betrachten (Jones & Tenenbaum, 2009). Eine Anpassungsstörung liegt vor, wenn stressvolle erwartete oder unerwartete Ereignisse eine Person dermassen aus dem Gleichgewicht bringen, dass sie ihr Verhalten stark beeinträchtigt und das Wohlbefinden und die Gesundheit beträchtlich einschränkt. Typischerweise sind eines oder mehrere Ereignisse als Ursache ausmachbar, welche dazu führen, dass die Person nicht mehr fähig ist sich adaptiv an die Ereignisse anzupassen. Dies obwohl aufgrund der persönlichen Geschichte der Person oder der Höhe der Stressoren anzunehmen wäre, dass die Person fähig wäre sich auf die Ereignisse funktional anzupassen. Werden Übertrainingsphänomene (nicht-funktionales Overreaching und Übertrainingssyndrom) als Phänomene von zu viel Training betrachtet, beschränken sich Behandlungsmethoden auf eine Reduktion des Trainings und eine Verbesserung oder Erhöhung der Regeneration. Oft sind jedoch die Ursachen von Übertrainingsphänomenen als multifaktoriell zu betrachten. Werden Übertrainingsphänomene als eine sportspezifische Form von Anpassungsstörungen betrachtet, eröffnet dies für die Behandlung neue Möglichkeiten.

Das Ziel der abschliessenden Case Study war es an Hand eines Fallbeispiels die diagnostische Übereinstimmung von nicht-funktionalem Overreaching und Übertrainingssyndrom einerseits und einer Anpassungsstörung andererseits aufzuzeigen. Mit

dem Fallbeispiel sollte zudem die Ätiologie und Pathogenese einer Übertrainingsproblematik unter dem spezifischen Blickwinkel einer Anpassungsstörung sowie die sich dadurch für die Behandlung offerierenden Möglichkeiten illustriert werden. Mit diesem Fall sollte zudem beispielhaft gezeigt werden, welche spezifischen Anforderungen Athletinnen und Athleten im Spitzensport zu bewältigen haben. Mittels des reflektierten Praxisbeispiels sollten zudem auch Methoden zur Bewältigung dieser aussergewöhnlichen Anforderungen exemplarisch dargestellt werden. Dies ist umso wichtiger, als dass es in der Literatur an solchen Praxisbeispielen mangelt und nach eigenen Forschungsergebnissen in etwa 30% der Schweizer Leistungssportlerinnen und Leistungssportlern im Verlauf ihrer Karriere mindestens einmal mit einem nicht-funktionalem Overreaching oder einem Übertrainingssyndrom konfrontiert werden (Birrer, Lienhard, Williams, Röthlin, & Morgan, 2013).

2.5.2 Stichprobe

Beim beschriebenen Fall handelt es sich um einen zum Zeitpunkt der Behandlung 21-jährigen Ruderer[3], mit internationalem Leistungsausweis.

2.5.3 Vorgehen und Datenanalyse

Bei der Verfassung der case study wurden die Empfehlungen von Cotteril und Kollegen (Cotterill & Schinke, 2017; Cotterill, Schinke, & Thelwell, 2017) angewendet. Um die Ähnlichkeiten zwischen nicht-funktionalem Overreaching / Übertrainingssyndrom und einer Anpassungsstörung darzustellen, wurden im ersten Teil die Begriffe ausführlich definiert, deren auslösende Stressoren und Symptome verglichen sowie vertieft diskutiert. Durch diese vertiefte theoretische Verankerung wurde sichergestellt, dass die beobachtete Symptomatologie und Ätiologie des Falles vor der Hypothese, dass wenn nicht-funktionales Overreaching / ein Übertrainingssyndrom als eine sportspezifische Form einer Anpassungsstörung betrachtet wird, neue und erfolgversprechende Behandlungsmethoden eröffnet, diskutiert werden konnte.

Den Empfehlungen von Coterill und Kollegen (Cotterill & Schinke, 2017) folgend wurde auch ein grosses Augenmerk daraufgelegt, kontextuelle Informationen darzustellen. Im Bemühen eine hohe Konstrukt-, interne und externe Validität anzustreben, wurden

[3] Da das Geschlecht für die Beschreibung des Falles irrelevant ist, könnte es sich beim beschriebenen Fall auch um eine weibliche Person handeln.

unterschiedliche Quellen zur Fallkonzeption verwendet, versucht eine kontinuierliche Kette unterschiedlicher, jedoch in sich zusammenhängender Informationen zum Fall über die gesamte Interventionsperiode zu sammeln und Teile der Informationen durch den Athleten validieren zu lassen. Eine Triangulation zur Validierung der Daten wurde dadurch angestrebt, dass mehrere und unabhängige Messinstrumente eingesetzt sowie qualitative und quantitative Methoden verwendet wurden. Diese bestanden erstmals aus den Beratungsnotizen des Beraters. Zudem wurde nach jeder Intervention ein formelles Beratungsevaluationstool eingesetzt, welches sowohl die Beratung aus der Perspektive des Beraters als auch aus der Perspektive des Sportlers evaluierte. Zudem konnte auf das Trainingstagebuch des Athleten mit den Aufzeichnungen zu besonderen Vorkommnissen wie Krankheiten, Arztbesuche und deren Ergebnisse, Ereignisse in Training oder Wettkampf, Diskussionen mit dem Trainer etc. zurückgegriffen werden. Da Befindlichkeitsveränderungen zuverlässige Merkmale sowohl von Übertrainingszuständen als auch von Anpassungsstörungen sind, wurden ausserdem in einer eher akuten Periode der Symptomatik wöchentliche Befindlichkeitsmessungen durchgeführt. Diese gaben Auskunft über den Befindlichkeitszustand des Athleten und dessen wöchentliche Veränderung. Im Zuge eines anderen Projektes, in welchem Athleten nachfolgend an die Behandlung einer Übertrainingsproblematik zu den aus ihrer subjektiven Sichtweise effektivsten Behandlungsmethoden befragt wurden, wurde mit dem Athleten ungefähr ein halbes Jahr nach dem Wiedereinstieg in die Wettkampftätigkeit ein Interview durchgeführt. Teile dieses Interviews wurden ebenfalls als weitere Datenquelle für die case study verwendet. Um die Validität dieser Datenquelle zu erhöhen wurde der Athlet auch gebeten das transkribierte Interview zu verifizieren. Diese Datentriangulation wurde mit einer persönlichen Fallreflexion durch den Berater ergänzt und abgeschlossen.

2.5.4 Resultate

Die Interventionen zur Bewältigung der als sportspezifische Anpassungsstörung betrachteten Übertrainingsproblematik beinhaltete Verfahren, welche das Bewusstsein des Athleten für seine grundlegenden bio-psychosozialen Prozesse erhöhten, ihm ermöglichten Quellen für seinen Selbstwert (Grawe, 2004) auch ausserhalb seiner athletischen Identität zu explorieren und seine athletische Identität in Frage stellten. Die Intervention beinhaltete Methoden der klassischen kognitiv-verhaltenstherapeutischen Ausrichtung (z.B. Autogenes Training) und damit der ersten und zweiten Welle der Verhaltenstherapie, und achtsamkeits- und akzeptanzbasierte Interventionen zur Erhöhung der psychologischen Flexibilität des Athleten. Wöchentliche Befindlichkeitsmessungen wurden sowohl als diagnostisches als auch

als evaluatives Instrument eingesetzt und zeigten einen für Übertrainingsproblematik typischen Verlauf mit dem für Übertrainingszustände beobachtbaren umgekehrten Eisbergprofil (Morgan, Brown, Raglin, O'connor, & Ellickson, 1987; Raglin, 2001). Die Ätiologie und Symptomatik des beschriebenen Falles zeigte, dass es angebracht scheint, nicht-funktionales Overreaching oder ein Übertrainingssyndrom als eine sportspezifische Anpassungsproblematik zu betrachten. Diese Betrachtungsweise könnte helfen die multifaktorielle Charakteristik einer Übertrainingsproblematik besser zu erkennen und den Behandlungsfokus zu erweitern. Der Athlet betrachtete sowohl Verfahren, welche eher klassischen kognitiv-verhaltenstherapeutischen Methoden zugeordnet werden können, als auch Methoden der dritten Welle der Verhaltenstherapie zur Bewältigung der vorliegenden Problematik, als hilfreich. Als besonders wichtig beurteilte er, dass er vom Berater mit schwierigen und persönlichen Fragen konfrontiert worden war. Dies zwang ihn zu intensiverem Nachdenken. Ebenfalls wichtig war die Beschäftigung mit persönlichen Werten und Zielen sowie die Akzeptanz von körperlichen und psychischen Zuständen auf der Grundlage der verbesserten Selbstwahrnehmung und des verbesserten Bewusstseins für die Wahrnehmung im Hier-Und-Jetzt.

2.5.5 Ausgelöstes Forschungsinteresse

Eine akzeptierte Manuskriptfassung des Artikels wurde am 20. Juli 2019 auf die Plattform Researchgate hochgeladen. Mit Stichtag 28. Juli 2019 wurden auf der entsprechenden Seite (Researchgate, 2019) 23 Reads verzeichnet. Davon waren 3 Volltextlesungen, bzw. Downloads.

3 Diskussion und Konklusion

Sport gibt es in unterschiedlichsten Formen und Varianten. Wer schon einmal in einem Esssaal an den Olympischen Spielen war, war beim ersten Mal sicher erstaunt über die unterschiedlichen Menschentypen, welche sich alle zu einem sportlichen Wettstreit, einem internationalen Megaevent, getroffen haben. Da steht die 2.05m grosse Volleyballspielerin neben dem 1.60m grossen Ringer, der 135 kg schwere Kugelstösser neben der 45 kg schweren rhythmischen Gymnastin und der 1.85m grosse und schlaksige Sportschütze neben dem ebenso grossen und ebenso schlaksigen Tennisspieler. Die Aufzählung dieser andersgearteten Menschen macht klar, dass die unterschiedlichen Sportarten auch unterschiedliche physische, technische und taktische Anforderungen an ihre Ausübenden stellen. Wie sieht es aber mit den psychischen Anforderungen aus? Sind diese ebenso unterschiedlich? Und welche Techniken und Strategien helfen Athleten diese psychischen Anforderungen zu bewältigen? Diesen Fragen wollte die vorliegende kumulative Dissertationsschrift nachgehen.

In *Publikation 1* wurde versucht die psychologischen Anforderungen an eine bestimmte Sportartengruppe, nämlich hochintensive Sportarten mit einem ähnlichen physischen Anforderungsprofil, zu bestimmen. Die Idee, welche dahinterstand, war es, Praktikern, welche mit Sportlern dieser Sportarten arbeiten, Hinweise zur Verbesserung, der Leistungserbringung der von ihnen betreuten Sportler, zu geben. Die Literaturrecherche zeigte, dass es praktisch keine empirischen Studien oder auch andere Arbeiten gab, welche es ermöglichte, die zu bewältigenden psychischen Anforderungen dieser Sportarten zu beurteilen, geschweige denn empirisch belegte Empfehlungen zu geeigneten Verfahren zu deren Bewältigung machen zu können. Auf Grund dieser fehlenden Erkenntnisse wurde auf theoretischer Basis ein Modell entworfen, welches helfen sollte die psychischen Anforderungen einer Sportart aufgrund von objektiven Anforderungen zu beurteilen. Die Anforderungen entstammten dabei sowohl aus dem Trainings- als auch Wettkampfkontext. So entstanden sieben Bereiche zur Beurteilung der objektiven Anforderungen einer Sportart, wovon zwei Bereiche sowohl den Trainings-als auch Wettkampfkontext betrafen. Dies waren Verletzungs- und Todesrisiko sowie Kooperation. Aus diesen sieben Anforderungsbereichen konnte auf insgesamt elf verschiedene psychologische Fertigkeiten geschlossen werden, welche geeignet schienen um bei der Bewältigung der Anforderungen zu helfen. Dabei wurde auf die bis anhin in der sportpsychologischen Literatur gängige Unterscheidung von psychologischen Fertigkeiten und möglichen Techniken zur Förderung dieser Fertigkeiten

zurückgegriffen (Seiler & Stock, 1994; Vealey, 2007). Auf Grund bestehender Literatur aus sportpsychologischen und sportfremden Quellen konnte eine grosse Anzahl von geeigneten Techniken zur Bewältigung der Anforderungen empfohlen werden. Die meisten dieser Techniken können der ersten und zweiten Welle der Verhaltenstherapie zugeordnet werden. Achtsamkeit als Vertreter der dritten Welle der Verhaltenstherapie wurde als eine der Techniken betrachtet, welche sich dazu eignet fast alle psychischen Fertigkeiten zur Bewältigung der sportspezifischen psychischen Anforderungen in gewünschter Art zu fördern. Achtsamkeit wurde in der ersten Publikation allerdings noch als eine unter einer Vielzahl von möglichen Techniken beurteilt.

Aus der heutigen Sicht fehlen in der ersten Publikation jedoch eine ganze Reihe von Ansätzen, welche zu einer Bewältigung von psychischen Anforderungen im Hochleistungssport beitragen könnten. Beispielsweise wie Befunde aus der *Ego Depletion* Forschung (Englert & Bertrams, 2012; Job, Bernecker, Miketta, & Friese, 2015; McEwan, Martin Ginis, & Bray, 2013), zu *Mental Contrasting* (Ruissen, Rhodes, Crocker, & Beauchamp, 2018) oder Musik (Jarraya, et al., 2012). Aus praktischer Sicht ist zudem ein wichtiger Punkt zu kritisieren. Die vorgeschlagenen Fertigkeiten und Techniken sind sehr zahlreich. So ist es für angehende Praktiker sehr schwierig geeignete Interventionen für die Arbeit mit Athleten aus diesen Sportartengruppen auszuwählen. Nichtsdestotrotz scheint der Artikel einen Einfluss auf die sportpsychologische Forschung und Praxis zu haben, wurde er doch nach den Angaben von Researchgate bis zum 15. Juli 2019 104-mal zitiert (Researchgate, ca. 2011).

Die Teilnahme an Olympischen Spielen stellt sowohl für Wettkämpferinnen und Wettkämpfer als auch deren Betreuungspersonen erhöhte Anforderungen. Erstens findet der Anlass lediglich alle vier Jahre statt, zweitens ist das Medieninteresse verglichen mit anderen Wettkämpfen jeweils extrem überhöht und drittens ist ein Multisportevent bezüglich Anzahl Teilnehmender als auch bezüglich der unterschiedlichen Sportarten für die Sportlerinnen und Sportler ein aussergewöhnliches Erlebnis. *Publikation 2* zeigte durch die Analyse der Interventionsthemen der Vorortinterventionen des offiziellen Schweizer Delegationspsychologen, dass ein Grossteil der Interventionen sich um die mentale Vorbereitung auf den Wettkampf drehten. Dies betraf etwa ein Fünftel aller Interventionen. Etwa 14% der Interventionen hatten mit Erwartungen oder Zielsetzungen zu tun. Das bestätigt die Vermutung, welche in der Einleitung der Arbeit geäussert wurde, dass Erwartungen als ein wichtiger Stolperstein der sportlichen Leistungserbringung betrachtet werden können.

Etwa 12% der Interventionen betrafen nicht spezifische Leistungsthemen. Dies beinhaltete Stressoren, welche direkt mit dem Wettkampf zu tun hatten, jedoch nicht genau den anderen vordefinierten Kategorien zugeordnet werden konnten. Dies könnten auch Themen wie etwa Leistungssorgen beinhaltet haben. Ebenfalls etwa 12% der Interventionsthemen betrafen die Selbstregulation. Hierbei ist zu beachten, dass in diese Kategorie auch Formen des Wettkampfdebriefings fielen, da das systematische Debriefing eines Wettkampfes eine wichtige Funktion in der Selbstregulation der Wettkämpferinnen und Wettkämpfer hat. Ein weiterer Aspekt, welcher aus der Studie hervorging, ist, dass in etwa 50% der Interventionen informell und nicht geplant waren. Offensichtlich haben viele Sportler zwar das Bedürfnis sich mit einem Spezialisten über Wettkampfthemen zu unterhalten. Dieses Bedürfnis scheint jedoch nicht so stark zu sein, dass die Personen sich bemühen aktiv mit einem Spezialisten an der Thematik zu arbeiten. Zusätzlich scheint die Arbeit an wettkampfspezifischen Themen ein gewisses Mass an Vertrauen zu benötigen, waren doch wettkampfspezifische Themen signifikant häufiger, wenn der Athlet/ die Athletin und der Sportpsychologe vorher schon miteinander gearbeitet hatten. Bei Krisensituationen oder organisatorischen Themen konnten bezüglich vorheriger Zusammenarbeit und der Inanspruchnahme von sportpsychologischer Hilfestellung kein Zusammenhang gezeigt werden. Offensichtlich sind Krisensituationen und organisationale Anforderungen mit einem solchen «Leidensdruck» verbunden, dass eine vorherige Zusammenarbeit nicht vonnöten ist.

Publikation 3, versuchte, unter Zuhilfenahme des Modells aus Publikation 1 die allgemeinen Anforderungen an eine sportliche Leistungserbringung zu formulieren. Gleichzeitig wurden die Grenzen herkömmlicher psychologischer Techniken, welche vor allem aus der ersten und zweiten Welle der Verhaltenstherapie stammen, aufgezeigt. Theoretisch wurde dann abgeleitet, welche Vorteile die Anwendung von *Dritte Welle Methoden* in der Arbeit im Hochleistungssport haben könnten. Es wurden auch zahlreiche mögliche Wirkmechanismen vorgeschlagen, wovon vordringlich eine verbesserte Emotionsregulation, Aufmerksamkeitsregulation und erhöhte kognitive, emotionale und verhaltensbezogene Flexibilität zu nennen sind. Welche Rolle dabei Angst spielen könnte wird in der vierten Publikation selber untersucht.

Publikation 3 hat ebenfalls einiges Echo in der *Scientific Community* erhalten und wurde nach der Plattform Researchgate bisher 71-mal zitiert (Researchgate, ca. 2013). Andere Forschungsgruppen haben zudem begonnen einige der vorgeschlagenen Wirkmechanismen auch empirisch zu überprüfen. Erste Resultate zeigen, dass die angenommenen Mechanismen

bezüglich Emotionsregulation (Josefsson, et al., 2019; Josefsson, et al., 2017) und Grübeln (Josefsson, et al., 2017) tatsächlich zutreffen könnten. Achtsamkeits- und akzeptanzbasierte Methoden könnten in diesen Aspekten traditionellen psychologischen Techniken überlegen sein. Beide scheinen zwar psychologische Fertigkeiten zu verändern, dies jedoch auf unterschiedliche Art und Weise. Dies deckt sich mit Befunden aus der Psychotherapieforschung (Forman, et al., 2012).

Publikation 4 zeigte unter der Verwendung einer grösseren Schweizer Athletenstichprobe, dass Achtsamkeit mit der selbsteingeschätzten Fähigkeit einhergeht, sportliche Leistung unter Druck abrufen zu können. Das deutet darauf hin, dass dispositionelle Achtsamkeit tatsächlich für den Abruf sportlicher Leistung förderlich ist. Ausserdem sprechen die Resultate der *Publikation 4* für einen in Publikation 3 vorgeschlagenen Wirkmechanismus, nämlich, dass Achtsamkeit die Leistung über eine Verringerung negativer Emotionen (in der Publikation Wettkampfangst) begünstigt. Eine weitere Annahme der in Publikation 3 gemachten Annahmen könnte Bestätigung finden, nämlich, dass Achtsamkeit die Bereitschaft erhöht sich unangenehmen Emotionen auszusetzen (*Exposure*) und sich nicht in Vermeidungsverhalten zu verstricken. Es zeigte sich nämlich, dass Achtsamkeit erwartungsgemäss den Abruf sportlicher Leistung unabhängig von unangenehmen inneren Zuständen ermöglicht. Diese Effekte zeigten sich jedoch lediglich für kognitive Angstaspekte. Somatische Angst hatte keinen entscheidenden Einfluss auf die Leistungserbringung. Somatische Angst könnte die sportliche Leistung vielleicht lediglich beeinträchtigen, wenn somatische Angst als schädlich eingestuft wird (Hanton, Wadey, & Connaughton, 2005) oder bei Personen mit wenig Selbstvertrauen (Hardy, Woodman, & Carrington, 2004).

In *Publikation 5* wurde die Ätiologie, Symptomatik und Behandlung eines Athleten mit einer Übertrainingsproblematik beschrieben. Die Übertrainingsproblematik wurde als eine sportspezifische Form einer Anpassungsstörung betrachtet. Diese Betrachtungsweise beinhaltete, dass der Athlet ganzheitlich in seiner bio-psychosozialen Vielfalt betrachtet wurde. Eine Anpassungsstörung besagt, dass ein Mensch nicht mehr fähig ist sich adaptiv an die Anforderungen seines Lebens anzupassen. Die Anforderungen an den in der publizierten Case Study beschriebenen Ruderers, waren vielfältiger Art und beinhalteten sportimmanente als auch sportfremde Stressoren. Die verwendeten Interventionen beinhalteten vor allem dritte Welle Verfahren der Verhaltenstherapie, wurden jedoch auch mit gut begründeten erste und zweite Welle Verfahren ergänzt. Der geschilderte Fall zeigte wiederum, dass psychische

Anforderungen mit den Leistungserwartungen des Individuums, seiner Emotionsregulation, seiner motivationalen Schemata im Zusammenhang mit Zielverfolgungen und der Befriedigung der psychologischen Grundbedürfnisse sowie einem adaptiven Umgang mit Umweltfaktoren zu tun haben. Diese vier Bereiche können auch als allgemeine psychische Anforderungen im Zuge einer Spitzensportkarriere betrachtet werden. Obwohl eine kürzlich erschienene Metaanalyse allgemein die Wirksamkeit von psychologischen Interventionen im Sport generell nahelegt (Brown & Fletcher, 2017), werden achtsamkeits- und akzeptanzbasierte Interventionen auf Grund der skizzierten möglichen Vorteile als besser geeignet vorgeschlagen. Die drei Prozesse (1) gegenwärtige absichtsvolle Bewusstheit, (2) metakognitive Bewusstheit und (3) Akzeptanz könnten dabei mögliche wichtige Mediatoren sein. Ziel der psychologischen Arbeit mit (Hochleistungs-) Sportlern sollte die Erhöhung von psychischer Flexibilität sein, um die eigenen und fremden Leistungserwartungen besser einordnen zu können, die eigenen nicht adaptiven motivationalen Schemata um Zuge der Zielverfolgung modulieren zu können, die eigenen Emotionen besser regulieren zu können und schlussendlich einen adaptiven Umgang mit Umweltfaktoren zu erreichen. Psychologische Flexibilität wird in der Akzeptanz- und Commitment Therapie (ACT) (Steven C. Hayes, Strosahl, & Wilson, 2012) als hauptsächliches Therapieziel angestrebt. Die Case Study aus Publikation 5 zeigte, dass ACT im Hochleistungssport gewinnbringend eingesetzt werden kann.

4 Literatur

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5 Anhang (Manuskripte)

Anhang A:

Publikation 1: Birrer, D., & Morgan, G. (2010). Psychological skills training as a way to enhance an athlete's performance in high-intensity sports [Training psychologischer Fertigkeiten als ein Weg zur Verbesserung der athletischen Leistung in hochintensiven Sportarten]. *Scandinavian Journal of Medicine & Science in Sports*, *20*, 78–87. doi: 10.1111/j.1600-0838.2010.01188.x

Anhang B:

Publikation 2: Birrer, D., Wetzel, J., Schmid, J., & Morgan, G. (2012). Analysis of sport psychology consultancy at three Olympic Games: Facts and figures. [Analyse der sportpsychologischen Beratung an drei Olympischen Spielen: Fakten und Zahlen]. *Psychology of Sport and Exercise*, *13(5)*, 702-710. doi: 10.1016/j.psychsport.2012.04.008

Anhang C:

Publikation 3: Birrer, D., Röthlin, P., & Morgan, G. (2012). Mindfulness to enhance athletic performance: Theoretical considerations and possible impact mechanisms [Achtsamkeit zur Verbesserung der sportlichen Leistung: Theoretische Überlegungen und mögliche Wirkmechanismen]. *Mindfulness*, *3*, 235–246. doi: 10.1007/s12671-012-0109-2

Anhang D:

Publikation 4: Röthlin, P., Horvath, S., Birrer, D. & grosse Holtforth, M. (2016). Mindfulness promotes the ability to deliver performance in highly demanding situations [Achtsamkeit fördert die Fähigkeit, in anspruchsvollen Situationen die Leistung in abrufen zu können]. *Mindfulness*, *7*, 727-733. doi: 10.1007/s12671-016-0512-1

Anhang E:

Publikation 5: Birrer, D. (in press). Rowing Over the Edge – Non-Functional Overreaching and Overtraining Syndrome as Maladjustment: Diagnosis and Treatment under a Psychological Perspective – A Case Study [Rudern am Abgrund – Nicht-funktionales Overreaching und Übertrainingssyndrom als Fehlanpassung: Diagnose und Behandlung aus

psychologischer Perspektive – eine Fallstudie]. *Case Studies in Sport and Exercise Psychology*. doi: 10.1123/cssep.2019-0006

Anhang A

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Review

Psychological skills training as a way to enhance an athlete's performance in high-intensity sports

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The importance of psychological skills training (PST) in the development of athletic performance is widely recognized. This paper is a comprehensive review of PST in elite sports, with a special focus on high-intensity sports (HIS). The reviewed literature showed a lack of convincing evidence and theoretical underpinning concerning traditional psychological skills to enhance performance in HIS. Therefore, a model with three conceptual levels (psychological demands, skills and techniques) is presented. The model facilitates the identification of the psychological demands of a specific sport, which in turn enables distinguishing which psychological skills are required. This allows an expert to choose psychological techniques to improve the athlete's psychological skill. Considerations based on our model and the limited HIS-related literature available revealed self-skills, personal development and life skills, arousal-regulation skills, volitional skills, motivational skills and recovery skills as the most important skills to address in order to enhance performance. Development of harmonious passion, in-practice integration of volitional strategies, use of associative attentional techniques, pain management techniques, use of the mindfulness-acceptance approach and the facilitative interpretation of cognitive and somatic sensations are regarded as suitable to meet the psychological demands of HIS. They are recommended for systematic application by athletes and coaches.

In today's professional and semi-professional sports, the thin line between winning and losing is becoming progressively thinner. At the Beijing Olympic Games in 2008, the difference between first and fourth places in the men's rowing events averaged 1.34%, with the equivalent for women being a mere 1.03%. This increasing performance density creates massive pressure. Thus, it is not surprising that in recent years, the importance of psychological skills training (PST) has been recognized, and the number of athletes using psychological training strategies has increased.

This paper aims to address the effect of PST on an athlete's performance progress, with a special focus on a group of sports involving a high-intensity load. High-intensity sport (HIS) is characterized by an impact duration between 1 and 8 min, with a very high-impact intensity and a continuous power output throughout the performance phase. Typical examples of HIS are rowing, swimming, 800 and 1500 m track and field running, track cycling and flat-water canoeing. While some authors (e.g. Mujica, 2009) state that high-intensity exercise is also crucial in team sports, this paper focuses merely on individual sports because the psychological demands in these two sport forms are very different. This paper argues that in attempting to achieve outstanding performance, PST should be adapted to the psychological and physiological demands of each discipline. Therefore, it introduces the systematization of PST and proposes a model for the identification of the psychological demands of a specific sport. With this focus and the few available research findings, this review addresses the psychological demands of HIS and describes how these specific demands can be met through the systematic development of different psychological skills and the application of psychological techniques.

Systematization of PST

''Psychological skills training (PST) refers to the systematic and consistent practice of mental or psychological skills for the purpose of enhancing performance, increasing enjoyment, or achieving greater sport and physical activity self-satisfaction'' (Weinberg & Gould, 2007, p. 250). Therefore, PST should be systematic, goal-oriented, planned, controlled and evaluated (Seiler & Stock, 1994). In recent years, the literature on the use of psychological skills has become rapidly available. Most literature on PST use the expressions ''psychological skills'' and ''mental techniques'' more or less

interchangeably, whereas some authors (Seiler & Stock, 1994; Vealey, 2007) differentiate between psychological skills as the desired outcome (e.g., increased self-confidence and enhanced attentional focus) and psychological methods or techniques (e.g., imagery and self-talk) as the means to promote the desired outcomes through the systematic application of these techniques. In this context, a skill is the learned capacity (or ability) to carry out a specific task. A technique is the procedure used to enhance that capacity in order to be able to complete this task. Imagery, goal-setting, self-talk and physical relaxation techniques are named as the four basic mental techniques predominantly used in sport psychology interventions, supplemented with multimodal PST, which incorporates a combination of these basic techniques (Vealey, 2007). However, there are numerous additional techniques used to enhance the psychological skills of an athlete, e.g., cognitive restructuring. Sometimes, the term ''psychological strategies'' is used for the application of psychological techniques. In this paper, the term ''strategies'' is used to refer to the means or the plan of action used to achieve the enhancement of psychological skills by using one or more psychological techniques. In this context, it is important to note that the same psychological technique can be used for the development of different psychological skills, depending on the specific application.

Current state of knowledge regarding traditional PST in HIS

Psychological skills are posited as effective for attaining optimal athletic performance (Hardy et al., 1996), and the benefit of PST is widely reported (Vealey, 2007; Weinberg & Gould, 2007). Although considerable scientific evidence is available regarding the efficacy of traditional psychological performance-enhancement methods, some authors claim that sport psychology interventions have not been critically examined, and most studies investigating the efficacy of PST do not meet the criteria for evidence-based empirical support (Gardner & Moore, 2006). Gardner and Moore analyzed 104 empirical studies investigating the efficacy of PST by using objective measures of athletic performance. Of these, only four studies involved HIS, met the criteria for adequate design and methodology, used competitive athletes as participants and therefore enable generalizing the results onto skilled or elite athletes. Only one of these studies showed performance enhancement.

This study was conducted with triathletes and showed a performance increase in two out of three participants in a 1600 m run by using a multimodal psychological intervention package (self-talk, imagery and relaxation) (Patrick & Hrycaiko, 1998). Although triathlon is not regarded as HIS, this study is reported here because the performance investigated had the characteristics of HIS. Additionally, literature searches using different search engines (PsycINFO, Psyndex plus, SPORTDiscus) with ''PST,'' ''mental skills training'' or ''HIS'' as search terms detected no articles. We found only six related studies (one for rowing and five for swimming), when using HIS-identified sports (rowing, track cycling, swimming, canoeing and 800–3000 m track and field) combined with ''PST'' or ''mental skills training'' as search words. One of the studies was not reported in the Gardner and Moore analysis. Sheard and Golby (2006) showed with 36 young elite swimmers a significant post-PST performance enhancement after a 7-week PST training program (goal-setting, imagery, relaxation, concentration and thought stopping) in three separate swimming strokes, each over 200 m. The 200 m swimming distance would be defined as a typical HIS discipline. Unfortunately, the study lacks a control group.

Nevertheless, the reported scientific evidence provided by studies using randomized controlled between group design or single-case design with intervention comparison and the target population (competitive athletes) is sobering. It has to be recognized that information concerning the utility of PST for skilled elite athletes in general and in HIS remains limited.

Psychological demands of HIS

Although numerous applied sport psychology books are available today, the recommended training programs usually are quite generic in form, and sport-specific PST programs are more the exception than the rule. This is remarkable, bearing in mind that the performance-relevant tasks of say a soccer player and a 200 m breaststroke swimmer are very different. However, to systematically support the performance outcome in a specific sport, it is important to know what demands an athlete has to meet in order to choose the most promising and best-adapted intervention. However, the literature addressing the psychological demands of HIS is very rare. Kellmann et al. (2006) discussed the psychological aspects of rowing. In their discussion, they proposed that the critical skills are motor skills (the ability to balance the boat and pull the oars and skulls in an efficient and effective manner), volitional skills (to overcome fatigue and maintain the rhythm of the boat despite high fatigue and lactate concentration), regulation of stress and pressure (anxiety – the fear of being replaced by highly motivated rowers and the anxiety of performing in the competition and being able to

maintain the rhythm of the boat), coordination/communication skills (to proactively avoid potential sources of conflict) and recovery (to speed up recovery process and being open to new training impulses). Elbe and Wenhold (2009) report that training and competing in HIS require specific motivational and volitional demands. It appears that elite HIS athletes differ from non-elite athletes in their understanding of the motivational concepts *hope for success* and *fear of failure*. From the perspective of volitional demands, the authors further report that elite HIS athletes appear to have a lower *loss of focus* and a lower *lack of activation* compared with non-elite athletes (Elbe & Wenhold, 2009). Apart from the reported literature, there is little knowledge available about psychological demands in HIS.

Another way to identify demands of a specific sport is to systematically gain insights based on theoretical considerations using a comprehensive model. Unfortunately, the models suitable for systematic analysis of the psychological demands of a specific sport are limited. Therefore, the following sections will try to outline a preliminary model suitable for the systematic identification of psychological demands of a sport. The sections will also identify the most important psychological demands in HIS based on this model and suggest which psychological skills might have a performance-enhancing effect. The suggestions will be based on these theoretical considerations as well as the sparse literature addressing psychological requirements of HIS.

Schnabel et al. (2008) presented a framework to identify the psychological demands of a specific sport. This framework is one of the few attempts to summarize the psychological requirements in a sport, which we found worthwhile to develop further. In their model, demands such as *duration*, *intensity* and *continuity of the impact*; *complexity* and *variability of the action*; *movement pattern and movement complexity* and *cooperation between the athlete and all members of the party* dictate the psychological skills required for successful competing in the relevant sport. We complemented their model with the following demands: *training scope*, *training intensity* and *training years* [keeping in mind the 10-year or 10 000-hour rule in Ericsson et al. (1993)]; *psychosocial development* (that each sporting/non-sporting individual needs to fulfil) and finally the *injury* and *death risk* a sport can pose, because we believe that these demands are important for thorough analyses. Contrary to the original model in Schnabel et al. (2008), psychological skills (instead of unspecific psychological terms) are hypothesized to help to regulate the athlete's behavior to meet the demands of the specific sport. Following Baldasarre et al. (2003), the psychological skills addressed are *attention*, *motivation*, *volition*, *arousal regulation*, *perceptual cognitive functions* and *motor control*. Additionally and in relation to the various *self* constructs in Vealey (2007), e.g., self-awareness, self-efficacy, self-worth, self-confidence, *personal development* and *life skills*, *coping skills*, *communication*, and *leadership skills* and finally *recovery skills* that are important for many sports are integrated in the expanded model.

Figure 1 depicts the adapted model. The two above-described conceptual levels (demands and skills) are complemented with the most used psychological techniques to enhance psychological skills. The most important hypothesized demands and skills are hallmarked in boldface. The following sentences will try to identify the demands of various HIS. Movement patterns and movement complexity differ from sport to sport, sometimes even between disciplines in the same sport. With the presented model in mind, rowing can be considered as a quite technically demanding sport, compared with the 800 m track and field running. In swimming, the movement pattern of 200 m freestyle demands a highly optimized movement pattern, whereas the movement pattern of 200 m breaststroke requires the same optimized movement pattern in addition to a very demanding movement complexity. Although there are differences, most HIS are cyclic sports, with the motion being repeated many times. Therefore, task complexity and variability of HIS can be regarded as low (competition always occur in the same or similar environmental conditions; distances are always the same and the only variability in action is tactical in nature). The impact duration differs from 1 to 8 min; intensity and continuity of the impact are very high throughout the performance phase, which involve near maximal energy supply for the sustained period (Laursen, 2009). The required cooperation for world-class performance is low in most of these sports. The exceptions are rowing and canoeing (team boats) and some track cycling disciplines. Generally, injury and death risk in HIS competitions can be viewed as low (no impact from opponents and no objective risks, with the possible exception of track cycling), whereas the overuse injury (and overtraining) risk due to very high training volumes and very high training intensities can be considered as high. The objective requirements for training and lifestyle of HIS persons are mostly influenced by the necessary training scope, training intensity and training years. Ericsson et al.'s (1993) rule of thumb can be regarded as relevant for all HIS, with tough, extensive training schedules and very high training intensities. Psychosocial developmental tasks can provide the background for failure, in conjunction with performance pressure and extensive training requirements.

In summary, taking into account theoretical considerations about the psychological requirements and the shortage of literature regarding the psychological

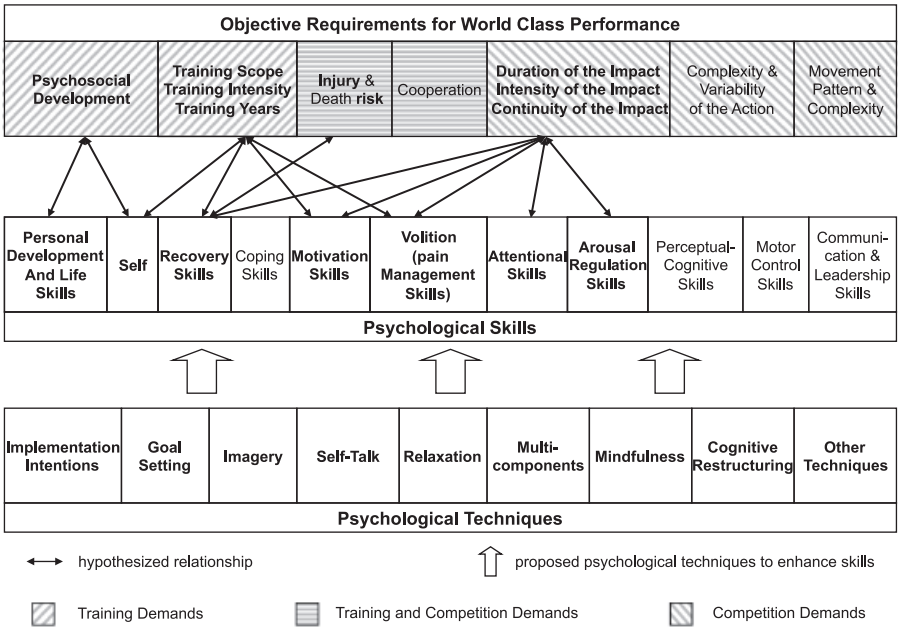

Fig. 1. Potential psychological skills to cope with the psychological requirements for world-class sport performance (hypothetical example for a high-intensity sports is in bold type: 1500 m running) and the psychological techniques to develop them (adapted from Schnabel et al., 2008).

demands of HIS, we have revealed the following psychological requirements. (1) Athletes training and competing successfully in HIS have to be able to cope with very high training volumes and training intensities over a period of several years. (2) Despite the high training volumes, they have to accomplish normal developmental tasks. (3) The complexity and variability of the action are low, but the movement pattern can be quite complex. (4) HIS athletes have a high overuse injury and overtraining risk due to very high training intensities and volumes. (5) The impact duration, intensity and continuity demand a maximal energy supply, which is linked with the rapid development of muscle fatigue. (6) The performance density evokes a high performance pressure and the potential for fear of failure. We suggest that the summarized psychological demands of HIS necessitate the systematic use of the following psychological skills: (1) self-skills, personal development and life skills (to fulfil the normal developmental tasks and to cope with high training demands); (2) arousal-regulation skills (to regulate stress and pressure); (3) volitional skills (to overcome pain and fatigue due to specific performance demands); (4) motivational skills and (5) recovery skills (to cope with high training and performance demands and minimize the injury and overtraining risk).

PST to meet the requirements of HIS

Scientific proof for the efficacy of traditional psychological techniques in HIS appears to be limited. Therefore, the following paragraphs will focus mainly (with the exception of the few studies we found) on potentially important psychological requirements of HIS and how they can be supported by a systematic application of psychological processes based on theoretical considerations. Further the paragraphs will explore scientific evidence for interventions stemming from other HIS-related sports or general psychology. Although motivational skills have been identified as important to meet the demands of HIS, we have largely left them out, because a thorough discussion of them would have gone beyond the scope of this paper. Nevertheless, motivational issues are addressed in several paper sections and a summary of motivational training forms can be found in Birrer and Seiler (2006).

Self-skills, personal development and life skills

The development of various self-constructs appears to be a key issue in an athlete's career. Self-efficacy (Bandura, 1997) has been one of the mainstream issues in psychology for the past 20 years. It describes the appraisal of a person for his capability of executing a specific task. Self-efficacy appears to be associated with performance success, and a lack of self-efficacy or self-esteem is associated with underperformance and unhealthy behavior such as eating disorders and drug abuse (Petrie & Greenleaf, 2007). Self-efficacy is closely related with other self-constructs such as self-awareness, self-consciousness, as well as self-concept and should be facilitated systematically. For an athlete to be aware of his or

her own strengths and weaknesses, desires and flaws are key factors in this process. Literally, to be aware of oneself is the first step in enhancing self-consciousness, and as a result, self-efficacy. To influence one's self-efficacy, multiple strategies are recommended. Many PST programs aiming to enhance the self-efficacy of athletes are predominantly using goal-setting techniques. Eberspächer (1995) suggested a psychological-oriented training method for the development of self-efficacy, where athletes have to predict their performance in a task during training. These sessions aim to improve self-efficacy through the development of realistic goals.

Self-concordance refers to the feeling of ownership that people have with regard to their goals. It describes goal congruency with implicit personal interests and values (Koestner et al., 2002). Findings suggest that people with high self-concordance are better able to attain their goals, leading to an increased psychological adjustment. Consequently, it is important that athletes' goals match their implicit interests and values. Enhancing self-awareness can help to explore one's implicit interests and values and identify a possible mismatch with personal goals. Unfortunately, no research is available that explores the influence of self-concordance or the use of goal-setting on the performance of elite HIS athletes.

Teaching life skills to young athletes recently came in the focus of applied sport psychology. There are two studies reporting the effectiveness of a life skill-training program. In a randomized controlled between group design, the effect of a predominantly goal-setting-based intervention of eight 15-min sessions on performance and self-beliefs was shown (Papacharisis et al., 2005) with 32 young female volleyball players and 32 male soccer players. In another study, Curry and Maniar (2003) investigated the effect of a semester-long life skills education program, using a non-randomized control design, on 62 student athletes playing various sports. The course was a combination of the practice of classic performance-enhancement strategies, including arousal/affect control, goal-setting, imagery and flow and a life skill training program targeting confidence, trust, on-/off-field problem solving, sports nutrition, transitions and drug/alcohol issues. Performance, measured by the coach's rating, significantly improved in the life skill group but not in the control group. The effect size was moderate to high, suggesting that a life skill program is helpful in increasing the performance of university athletes. Another worthwhile concept is the approach of harmonious and obsessive passion (Vallerand et al., 2008). Obsessive passion refers to controlled internalization of an activity in one's identity that creates an internal pressure to engage in the activity. Harmonious passion refers to an autonomous internalization that leads individuals to choose freely to get involved in an activity they like. Harmonious passion promotes healthy adaptation, whereas obsessive passion prevents it by causing negative effect and rigid persistence. Findings with high-school basketball players, synchronized swimmers and water-polo players suggest (Vallerand et al., 2008) that harmonious passion is conducive to high levels of performance and well-being. Obsessive passion can facilitate or inhibit (when related to performance-avoidance goals) performance attainment and appears unrelated to happiness. Consequently, the development of harmonious passion could have an influence on both personal development and performance enhancement.

Arousal regulation: overcoming pressure and fear

Arousal is defined as the cognitive and somatic reaction to an internal or external stimulus. It is generally supposed there is an optimal state of arousal for high performance. The optimal level of arousal is defined through situational factors, the combination of cognitive and affective sensations (Hardy et al., 1996), individual preferences (Hanin, 2000) and the requirements of the particular task or sport. Therefore, the state of arousal can be influenced through control of the situation, appraisal of situational factors, and transformation of cognitive and affective sensations (Seiler, 1992). What appears to be crucial in this context is the presence of fear of failure (Kellmann et al., 2006; Elbe & Wenhold, 2009). The psychological and physical impacts of fear are numerous. It affects athletes' affective state, can reduce athletes' motivation to train and compete, affects athletes' self-confidence and their volitional and attentional skills, produces feelings of anxiety and increases muscle tension, which can lead to loss of coordination.

A number of strategies have been proposed for performers to modify their arousal state: psych-up psych-down techniques involving self-talk, imagery, physical activity, short or cued relaxation; pre-performance and performance routines; mental rehearsal strategies; stress management and mood-enhancement strategies (Hardy et al., 1996). Most research shows that these strategies can reduce anxiety or reduce the interpretation of symptoms of performance anxiety as debilitating (e.g. Page et al., 1999). Almost all studies have failed to show a clear impact on performance (Gardner & Moore, 2006). One reason might be that it is still not clear whether and when anxiety or fear exerts a beneficial effect, what arousal level is performance facilitating and under which conditions the same level might be debilitating. Hardy et al. (1996) commented that the "early recognition and control of anxiety symptoms were associated with superior performance in elite athletes" (p. 171). This statement indicates that two factors are important for competitive athletes:

(1) athletes have to know their individual performance-facilitating state of arousal before and during the competition. (2) Athletes have to be aware of their current state of arousal and how they can influence it in the direction of the performance-facilitating state. Both notions highlight the importance of self-awareness processes.

However, considering the amount of research that has been conducted in this area, there is surprisingly little sports-specific knowledge regarding the individual optimal level of arousal. Studies by Hanton et al. (2005) might represent a considerable advance in the understanding of competitive anxiety and performance-facilitating arousal state. They found that athletes can interpret the intensity of anxiety-related symptoms or arousal as either facilitative (athletes are termed "facilitators") or debilitative (athletes are termed "debilitators") toward performance and that this differentiation might be critical in the coping efficacy before a competition. Facilitators and debilitators experience more or less the same feelings in phases before a competition, but the intensity is less in facilitators. Facilitators appeared to be capable of using a repertoire of psychological skills, which enabled them to reinterpret negative cognitive and somatic sensations as performance facilitating. In contrast, debilitators tried to use the same psychological skills but were not able to internally control these skills and experienced a loss of control (inability to attain a positive pre-performance state), lower confidence and an ongoing debilitative interpretation of the sensory input (Hanton et al., 2005). Thomas et al. (2007) showed that it might be possible to restructure athletes' interpretation of anxiety and confidence symptoms with a multimodal intervention (imagery, rationalization, cognitive restructuring, goal-setting and self-talk), with positive effects on their confidence and anxiety appraisal as well as their performance. Unfortunately, the limitation of this research is the lack of a control group.

Despite these promising results, there appears to be a great number of athletes who experience difficulties in controlling their cognitive processes. This might be explained by ironic mental processes (Janelle, 1999). In the last two decades, intervention techniques that target acceptance instead of the direct control of cognitive and affective processes were suggested. They have been recommended as alternatives to change-based traditional cognitive-behavioral treatment. Mindfulness-based cognitive therapy (Segal et al., 2002) and his sport-specific adaptation, the mindfulness-acceptance-commitment approach (Gardner & Moore, 2006), are two of the proposed interventions. These mindfulness techniques emphasize the non-judging awareness and acceptance of present cognitive, affective and sensory experiences, including external stimuli and internal processes. Stimuli that enter awareness are observed but not judged, and internal experiences (thoughts, feelings and sensations occurring through internal or external stimulation) are instead accepted as natural, transient facets of human existence.

Numerous studies support the effectiveness of mindfulness-based interventions with clinical and non-clinical populations (e.g. Grossmann et al., 2004). Again, these studies are rare in sports. Nevertheless, the use of the mindfulness approach appears to be fruitful for HIS athletes, because it supports the need for meta-cognitive attention to external cues, performance-enhancing openness to options, as well as contingencies. Therefore, it can be hypothesized to have an impact on several psychological skills, for example, arousal regulation, attentional skills, volitional skills, personal development and life skills. The first promising research findings regarding mindfulness and athletic performance are available (Gardner & Moore, 2006; Kee & John Wang, 2008), but unfortunately, not regarding HIS.

Volitional and pain management skills: overcoming fatigue and pain

Athletes normally possess high performance motivation. In duels or very exhausting activities, there are often unexpectedly high psychological and physical inner and outer resistances to overcome. Then, high motivation is frequently inadequate. In these situations, it is helpful to possess implementation intentions (Koestner et al., 2002) and shielding intentions. Implementation intentions dictate when, how and where activities should be implemented. Shielding intentions are used to conquer obstacles that occur during activities. In dependence on implementation intentions, shielding intentions' (Birrer & Seiler, 2006) purpose can be understood as an "if-then" relationship, e.g., "If someone attacks me, then I will easily enhance my step-rate and will orientate myself forwards." This means that possible obstacles that could occur during an activity are anticipated and linked with a specific activity plan to overcome them. The goal of implementation and shielding intentions is to maintain a pursued activity or even enhance effort despite the inner (pain) and outer (headwind) resistance. According to Mathesius (1993), conscious and purposeful intervention is thereby the crucial criterion for volitional regulation processes. By focusing on performance-relevant processes, the performance becomes actively aligned, and the distraction of performance obstacles is reduced. Self-talk, imagery and relaxation techniques can be used separately or in combination to control the focus on relevant processes during sporting activity. These techniques are used during tough training sessions in terms of psychological-orientated training, e.g.,

through neck-and-neck races or in sessions where the athlete reaches his limit. They are also embedded into tapering and pre-competition routines.

The ability to manage pain with psychological processes has been of interest since the 1970s (Flor, 2009). Pain is defined as an "unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such tissue damage" (International Association for the Study of Pain, 2009). Pain during physical effort is often not pathologically contingent. It can be interpreted as a threat to the individual's somatic integrity and is associated with increased arousal and anxiety (Flor, 2009), which makes it even more uncomfortable. The body tightens, which makes the physical effort even less effective and more painful. However, what HIS athletes experience during training and competition can be regarded as discomfort and not pain. They can always control pain by slowing down or stopping the physical activity. Findings from pain research show that exposure to pain can directly lead to habituation through decreased surprise, insecurity, and threat. This implies that an athlete can prepare himself for pain. The predominant thoughts are very important in this process. Negative thoughts such as "I am not able to sustain it" accompany less pain tolerance, whereas managing thoughts such as "I can do it" enhance pain tolerance and minimize the pain sensation (Flor, 2009). There is also a close relationship between the self-efficacy beliefs regarding pain tolerance and the release of endogenous opioids. The first findings in the field of exercise psychology with cycling ergometer tasks could confirm this proposal (Motl et al., 2007).

The findings of pain research suggest that the appraisal and interpretation of pain sensations are crucial to pain tolerance. Athletes can actively develop their pain tolerance. Therefore, the strength of the pain stimuli should be increased very slowly, enabling the athlete to gradually habituate to the increasing pain. The volitional strategies identified above, linked with shielding intentions, appear to be suitable to overcome pain. In a randomized control study, Whitmarsh and Alderman (1993) showed that athletes in a stress-inoculation training program showed significantly better performance times and a higher pain tolerance while performing a physical task. Unfortunately, research exploring pain management among athletes is rare. However, there is a research body (Masters & Ogles, 1998) investigating associative or dissociative attentional strategies in athletes, including pain.

Associative and dissociative attentional strategies

Associative and dissociative attentional strategies for influencing performance, enhancing endurance, moderating perceived exertion and managing pain have been addressed since the late 1970s (Morgan & Pollock, 1977). Most research was conducted with endurance sports, e.g., marathon running. The general findings are more or less consistent: associative strategies, where the athlete focuses on bodily sensations (such as muscle tension and breathing) and performance-specific cues (such as stroke rate in rowing or the round treadle in cycling), relate to faster performance. Dissociation strategies, where athletes focus on say music or the landscape in order to distract themselves from say muscle pain, relate to lower perceived exertion and possibly greater endurance (Masters & Ogles, 1998). In their review, Masters and Ogles (1998) claimed a lack of definitional clarity of association/dissociation, and crude dichotomies appear to be too simplistic to account for the full spectrum of an athlete's cognitions. Therefore, Stevinson and Biddle (1999) proposed a two-dimensional system to classify the thoughts of (competitive) endurance athletes, including task relevance (task-irrelevant/dissociation vs task-relevant/association) and the direction of attention (internal vs external).

Studies investigating the effect of associative and dissociative strategies in HIS confirmed the findings from other sports. Internal as well as external associative strategies resulted in a higher rating of perceived exertion levels (Stanley et al., 2007). Couture et al. (1999) showed that swimmers using an associative strategy (thinking the word *air* when inhaling) swam significantly faster than the control group. Two further supporting studies were conducted in a rowing task (Scott et al., 1999; Connolly & Janelle, 2003). In Scott et al. (1999), the mean performance enhancement between pre- and post-intervention tests was 3.76% for the internal association strategy ("feel the burn" and "listen to your breath") group, and in Connolly and Janelle (2003), the improvement was 1.9% for the internal association strategy group.

Recovery skills

One of the important requirements of HIS is the combination of high-volume and high-intensity training (Laursen, 2009). This necessitates very good recovery capabilities in order for the training to be most beneficial. Harmonious passion (Vallerand et al., 2008) and high self-awareness should have a positive impact on athletes' recovery. Furthermore, in general sports psychology literature, relaxation techniques are highlighted as being helpful to hasten the recovery processes after training or competition (e.g. Kellmann et al., 2006). However, so far, there has been a lack of convincing evidence that relaxation techniques are really effective in enhancing the recovery quality, reducing recovery time or

enhancing athletes' performance. Moreover, different relaxation techniques [e.g., progressive muscle relaxation (PMR), autogenic training, and self-hypnosis] are usually recommended for athletes, without taking into account individual differences in personality and the requirements of the particular sport. Indeed, relaxation techniques have their own unique effects (Lehrer, 1996), which should be considered. PMR might have an influence on immunoenhancement (Pawlow & Jones, 2005). However, preliminary results from an intervention study with long-distance runners suggest that PMR is detrimental when used directly after training in the attempt to enhance the recovery quality, whereas the use of self-hypnotic relaxation might have the desired recovery-enhancing effect (Schneider, 2007).

Implications and recommendations

This paper reviews the current knowledge on the effective use of PST in HIS. Convincing scientific evidence from the widely used PST programs and theoretical underpinnings regarding the psychological demands of HIS are not available. Research on HIS has provided limited empirical evidence, and hence, this paper's reflections are largely based on theoretical considerations and research from other areas. We present a preliminary model that appears suitable to systematically determine the psychological demands of a sport. This model can be used to identify the psychological requirements of HIS in competition and training such as, e.g. the capability to maintain maximal energy expenditure despite rapid increase of muscle fatigue and muscle pain. Based on the identification of the relevant psychological skills, we suggest that PST programs in HIS focus on the following psychological skills: self-skills, personal development and life skills, arousal-regulation skills, volitional skills, motivational skills and recovery skills.

PST should help athletes train hard, compete aggressively, maintain or sophistically adjust strategic plans and choices and take care of the "self." Therefore, establishing life skills programs, including the development of harmonious passion (Vallerand et al., 2008) and a thorough elaboration of personal goals along with the enhancement of self-concordance, might be a cornerstone. In this context, Birrer and Seiler (2006) proposed the systematic use of multiple goal-setting strategies in order to change avoidance motivation into approach motivation.

Another cornerstone appears to be training volitional skills, which would integrate the findings concerning associative and dissociative attentional strategies, the findings from pain management research, as well as those from the mindfulness approach. In this context, the concept of ironic mental processes (Janelle, 1999) should be considered.

A third cornerstone might be the in-practice integration of psychological techniques, carefully chosen to meet the requirements of the task at hand. Psychological techniques must support the automatic engagement of developed athletic skills, respond to contextual cues, and help athletes focus on the necessary aspects of competition or training. These include focusing on the present and coping with internal and external experiences. Again, the mindfulness approach can be valuable in this endeavour.

Although some scientists have raised the notion that research on the effectiveness of PST revealed only low treatment effects, if at all (Gardner & Moore, 2006), a minimal performance enhancement of 3% can make a significant difference at the elite level between winning a gold medal and not winning even an Olympic diploma. Therefore, the systematic and purposeful application of PST can make an important contribution. In this attempt, sport psychologists and coaches are advised to reflect on the following considerations. One of the targets of PST should be to initiate small improvements or progress in small steps, and it should aim to enhance training quality as well as competitive performance. Additionally, PST techniques are not universally applicable without considering individual differences between athletes and the specific function of the technique used. For example, self-talk can be used in different forms and functions and therefore also has different effects (Hatzigeorgiadis et al., 2007). Most importantly, before implementing a PST program, applied sports psychologists should first address the psychological requirements of the sport as well as the level of the athlete. Furthermore, to be effective, the intervention should be adapted to the specific training and competition phase of the season (as, e.g., demonstrated in Thomas et al., 2007). Therefore, the concept of periodization could also be adapted to PST (Holliday et al., 2008). Finally, although associative attentional strategies are considered to have a performance-enhancing effect, the question of when an athlete should associate and dissociate in training and how much time to spend on this or whether the excessive use of associative strategies is associated with the risk of the athlete over-reaching himself and over-training is not clear.

Perspectives

There is a lack of scientific research on PST in HIS. Knowing this, some additional points should be borne in mind and addressed here. Future research should focus on the relationship between the specific demands of HIS and specific PST interventions.

These interventions should be designed especially for HIS. Particular attention should be given to newly established interventions such as, e.g. the mindfulness approach or the periodization of PST. The outcome variable of interest should be preferably performance. A further important consideration is related to the research requirements of applied sport psychology, especially when high-performance athletes are involved. It should be agreed upon which research design is regarded as appropriate to identify empirically supported interventions for elite performers. Although it is important that an academic discipline show empirical support that meets the highest scientific standards, the difficulty of evaluating the efficacy of an intervention with a target group of elite athletes must be recognized and considered.

Key words: mental skills training, mindfulness, rowing, cycling, swimming, elite sport.

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Anhang B

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Analysis of sport psychology consultancy at three Olympic Games: Facts and figures

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ABSTRACT

Objectives: Despite many reports on best practises regarding onsite psychological services, little research has attempted to systematically explore the frequency, issues, nature and client groups of onsite sport psychology consultancy at the Olympic Games. The present paper will fill this gap through a systematic analysis of the sport psychology consultancy of the Swiss team for the Olympic Games of 2006 in Turin, 2008 in Beijing and 2010 in Vancouver.
Design: Descriptive research design.
Methods: The day reports of the official sport psychologist were analysed. Intervention issues were labelled using categories derived from previous research and divided into the following four intervention-issue dimensions: "general performance", "specific Olympic performance", "organisational" and "personal" issues. Data were analysed using descriptive statistics, chi square statistics and odds ratios.
Results: Across the Olympic Games, between 11% and 25% of the Swiss delegation used the sport psychology services. On average, the sport psychologist provided between 2.1 and 4.6 interventions per day. Around 50% of the interventions were informal interventions. Around 30% of the clients were coaches. The most commonly addressed issues were performance related. An association was observed between previous collaboration, intervention likelihood and intervention theme.
Conclusions: Sport psychologists working at the Olympic Games are fully engaged with daily interventions and should have developed ideally long-term relationships with clients to truly help athletes with general performance issues. Critical incidents, working with coaches, brief contact interventions and team conflicts are specific features of the onsite consultancy. Practitioners should be trained to deal with these sorts of challenges.

Competing at the Olympic Games is often considered the pinnacle of an athletic career (McCann, 2008). Its 4-year cycle makes the Olympic Games an exceptional event for athletes. Other factors contributing to its uniqueness are its multisport context and the immense media interest surrounding it. During the Olympic Games, sports, which normally do not arouse much public interest, are, for a short period, in the media's keen, but also unforgiving, focus. Haberl and Peterson (2006) concluded that competing at the Olympics is similar to being in a crucible that produces extraordinary pressures for all persons involved, whether athlete, coach or other support staff. The Olympic experience can be the reward for a long period of hard work, systematic preparation and suffering. If athletes succeed at the Games, not only does their previous investment (financial and effort) pay off, but also they might secure funding for the future (Haberl & Peterson, 2006; Pensgaard, 2008).

In their quest for Olympic success, many nations have increased their scientific support. Additionally, many sport associations and National Olympic Committees (NOCs) have integrated sport psychological services during the build-up to and at the Games itself (e.g., Blumenstein & Lidor, 2008; Samulski & Lopes, 2008). Consequently, the demand for scientific knowledge regarding psychological factors influencing or associated with successful Olympic performance has risen. There is a substantial amount of literature on the Olympic experience of athletes and on practise reports of Olympic consultants (for a review, see Gould & Maynard, 2009).

However, little research has been done on the most common psychological challenges and demands that sport psychologists face at the Olympic Games. For example, little is known about the number and type of interventions a sport psychologist has to deal with, which type of client he or she will most likely work with and which additional factors will most likely influence associated collaborative efforts (e.g., previous collaborations between sport

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psychologist and athletes/coaches). Answers to these questions would be valuable not only for sport psychologists in order to prepare themselves for an Olympic mission but also for National Olympic bodies to plan the assignments of sport psychologists and develop the functional specifications for such specialists within the support staff.

Research related to the specific onsite challenges and demands faced by sport psychologists at the Games and which may provide some insights, include (a) research on stress and coping in sports, (b) evaluations of the Olympic experience of athletes and coaches and (c) best-practise reports on onsite psychology consultancy.

Research on stress and coping of high-performance athletes

One can view seeking the support of a sport psychologist as an attempt to cope with the demands of a specific situation, where athletes/coaches consider their coping resources or strategies to be inadequate to the situational requirements. Not surprisingly, sport psychologists have been interested in examining various sources of perceived stress in elite athletes. To explore organisational stress issues, researchers have predominantly used qualitative methods. Woodman and Hardy (2001) proposed a theoretical framework for organisational stress that was also used by Fletcher and colleagues (Fletcher & Hanton, 2003; Hanton, Fletcher, & Coughlan, 2005; Mellalieu, Neil, Hanton, & Fletcher, 2009). They interviewed elite athletes with regard to potential sources of organisational stress while preparing for major international competitions (the Olympics and World Championships). Within this framework, issues that are directly related to sport performance are deemed to be competitive stressors, whereas issues that are not directed to sport performance are regarded as organisational stressors. Frequency analysis revealed that participants mentioned competitive stressors less often than organisational ones. However, Mellalieu et al. (2009) saw a need to investigate stressors encountered by elite athletes directly within the competition environment and primarily related to competition. Using a similar methodology, they focused on both competitive and organisational stressors experienced by elite athletes in the hour before competition. Inconsistent with earlier research, their findings demonstrated a similar number of performance and organisational stressors directly before a competition. Perhaps because of the temporal proximity to competition, more competitive stressors were present, as compared to earlier studies. Nevertheless, a significant number of organisational stressors were observed, demonstrating that these factors influence athletic performance 1 h before the competition.

However, while these researchers widened the focus concerning performance and organisational demands involved in athletes' preparation and competition, they failed to consider that the personal environment (e.g., differences of opinion with a significant other) may also affect an athlete's performance. Thus, factors beyond the scope of organisational and competitive demand also need to be addressed to understand the overall stress elite athletes experience.

Evaluations of the Olympic experience

Gould and colleagues investigated factors influencing athletes' Olympic performance success (Gould, Greenleaf, Chung, & Guinan, 2002; Gould, Guinan, Greenleaf, & Chung, 2002). For this purpose, 296 Atlanta and 83 Nagano U.S. Olympians as well as 46 Atlanta and 19 Nagano U.S. coaches rated the frequency and perceived impact of different factors on performance. Following Gould and colleagues' rationale and on behalf of the Swiss Olympic Association, Schmid (2005a) conducted a similar study with 87 Swiss Athens Olympians. These Olympians indicated whether they faced any of 33 specific potential stressors and whether they were negatively or positively influenced in their Olympic performance by these potential stressors. A high percentage of athletes were challenged by "good results of opponents before the games" (91%), "absolutely wanting to excel – high expectancies of self" (90%), "high coach expectations" (74%) and "lack of experience with Olympic specifics" (61%). In contrast, relatively few athletes faced "safety worries" (5%), "a lack of information regarding their competitors" (5%) or a "change of direct pre-event preparation" (6%). More significant than the mere presence of such potential stressors, however, is their ascribed positive or negative influence on Olympic performance. The following 12 stressors had the strongest influence on the athletes' performance: "difficulties keeping cool in challenging performance situations", "feeling of physical limpness", "difficulties in recovering", "lack of confidence in the coach's abilities", "lack of financial support", "disruption in the direct pre-event preparation through unforeseen distractions", "unfair umpire decisions", "lack of experience with uniqueness of Olympic competition", "bad timing of competitions before the Olympics", "head coach's incompetence", "change in the direct pre-event preparation" and "self-allegations during the Olympic competition".

To narrow down the factors for a possible intervention, Schmid (2005b) explored which factors had both a considerable negative impact and with which a significant number of athletes were challenged. This increased the list by eight factors: "lack of preparation for unexpected events and unforeseen distractions at the Olympics", "lack of familiarity with competition venue", "absolutely wanting to excel", "pressure due to great expectations", "challenging media demands", "sleep-onset and sleep-maintenance difficulties" and "unfamiliar weather/climatic conditions". All in all, 20 factors were identified as being relevant to Olympic performance success. These findings not only underline U.S. Olympic committee sport psychologist Sean McCann's idea (2008) that "at the Olympics, everything is a performance issue" (p. 267) but also serve as a cornerstone on which the Swiss Olympic Association built their preparation for the Olympic Games of 2006, 2008 and 2010.

Best-practise reports on onsite psychology consultancy

Another valuable source for preparing psychologists for onsite services are best-practise reports on effective Olympic psychological consultations. McCann (2008) reported on the wide scope of issues U.S. sport psychologists faced at the Games. He mentioned (a) clinical issues, such as suicidal ideation, depression, mania, compulsion, eating disorders; (b) problems with the adjustment to external factors (e.g., death of a family member, homicide by a friend, legal charges and marriage crisis); (c) financial crisis or drug-testing uncertainty; (d) interpersonal conflicts (e.g., conflict with agent, coach or teammate); (e) distractions at the Games, like issues with sexuality, the media and sponsors and (f) performance pressures due to coaches, the media, parents, significant others, agents and internal standards. This list shows that sport psychologists, as well as athletes and coaches, should prepare themselves for a wide variety of issues.

The literature concerning Olympic mental skills training programmes (e.g., Blumenstein & Lidor, 2008) focuses on psychological skills training prior to the Games. But as highlighted above, athletes might want to address a wide range of additional challenges and issues with a sport psychologist during the Olympics. This appraisal is supported by Hodge's (2010) review of the literature. He pointed out several mental issues as being relevant and common to the Olympic environment. Particularly, he identified stress management and coping with stressors, such as transport, security and

organisational hassles, living in the village and dealing with the disappointment of a poor performance as the most commonplace challenges faced by Olympians. Additionally, Olympic athletes need to fine-tune their pre-event mental preparation to meet the special demands of the Games environment. Other psychological consequences emerge from interpersonal conflicts between athletes, sometimes with coaches or team managers, as well as from injury, fear of injury, re-injury or illness. Another phenomenon described by Hodge (2010) is the so-called second week blues. He observed that the smooth athletic and psychological functioning of many members of the Olympic team is affected by irritability or homesickness after the first week of living in the Olympic environment. Further, friends and family members of competing athletes attend the Games to support their athletes. However, this is most often new for the athlete and might be an extra distraction and additional source of stress.

Onsite sport psychology consultancy at the Olympic Games differs in not only the issues raised by clients but also in the consultation setting itself. While most of the interventions in the preparation phase are typically scheduled and planned, many at the Olympics are informal in nature and not planned. Initial contacts where athletes or coaches approach the psychologist in a casual, unforced situation help build social bridges and may as well emerge to small interventions. They are often as effective as scheduled sessions and frequently lead to a traditional, more structured one-on-one consultation (Vernacchia & Henschen, 2008).

Given the unique schedule and pace of the Games, these field interventions are critical elements for success. Despite the informal character of many of these interventions, they should follow a certain protocol or employ a certain structure. Giges and Petitpas (2000) refer to such intervention strategies as "brief contact interventions",i.e. a single, unplanned professional interaction of short duration (15–20 min) taking place between client and practitioner "where clients are able to gain new perspectives on their present situations" (p. 177). The intervention normally employed in these informal situations is focused on performance enhancement. Other important psychological issues, even though they are visible, remain intentionally unexplored. According to Giges and Petitpas (2000), such interventions should be solution-focused, action-oriented, goal-oriented to a single manageable problem at any moment and supportive and convey a sense of control. However, to the best of our knowledge, data are not available on the frequency of this type of intervention or on the clients (e.g., athletes, coaches, team managers and medical staff) who call for such onsite sport psychology support.

Onsite sport psychology services for 2006, 2008 and 2010

In 2005, the Swiss Olympic Association decided to substantially expand the psychological services it provided to its delegation members and therefore integrated a sport psychologist into its team. The reason for this expansion was that during the 2000, 2002 and 2004 Olympics critical incidents happened that seriously jeopardised the functioning of at least a subsystem of the Olympic delegation. Thus, since the 2006 Olympic Games in Turin, a sport psychologist has been a fully integrated and accredited staff member of the Swiss Olympic team in order to be prepared for such emergencies. The sport psychologist received AO accreditation as part of the team's medical personnel with full access to the Olympic village and competition sites. The sport psychologist was accommodated in the Olympic village. If more than one Olympic village existed, however, he was assigned to a temporary accommodation in the village where his service was required.

As a member of the medical team, he needed to report directly to the chief medical officer and the "chef de mission" of the Swiss Olympic team. The position, function and role of the sport psychologist evolved in the three Olympic Games covered. Because of his appreciated work, he was selected as a member of the executive board of the Swiss Olympic delegation in 2010. In order to get acquainted with the athletes and coaches, the sport psychologist participated in the Swiss Olympic pre-events, that is, two days of meetings for athletes, coaches and delegates of the sports federations. They are held in the eighth or ninth month before the Olympics with the goal to prepare the participants for the upcoming Olympic season and sensitise them for the unique challenges of the Olympic Games. The 2006 Olympic Games, however, were an exception, because the decision to integrate a sport psychologist in the Swiss team was made after the Olympic pre-event. As a consequence, the sport psychologist joined the chief medical officer and visited prior to the Games all sporting teams in training camps or competitions. In 2008 and 2010, the sport psychologist held preparatory workshops (e.g., how to react in crisis situations) for the medical staff, the delegation leaders of the different sporting federations and the executive board. The main task was to educate the participants on how to react in crisis situations.

To select the official sport psychologist, the Swiss Olympic Association identified several criteria. The sport psychologist in question should have several years of experience in applied work with coaches and athletes. He should have a good reputation with athletes, coaches and the Swiss Olympic officials as well as an education in or practical knowledge of crisis interventions. Finally, the sport psychologist in question should be a team player and should be able to work closely with the chief medical officer and the Swiss Olympic "chef de mission".

Taking into account the lack of data on onsite sport psychology consultations at Olympic Games, the aim of this paper is to address the onsite work of the aforementioned official sport psychology consultant for the Swiss Olympic team. The findings are based on the hands-on experience gained during onsite counselling at one Summer (Beijing, 2008) and two Winter Games (Turin, 2006; Vancouver, 2010). In particular, this paper will firstly, quantify the intervention frequency, the types of interventions, the types of clients and their issues. Secondly, it aims to explore how previous collaboration between the sport psychologist on the one hand and athletes or coaches on the other affects the demand for onsite sport psychology consultancy at the Olympic Games.

Methods

Personal characteristics of the sport psychologist

The official sport psychologist was 37 years old and had 8 years' experience working with athletes and coaches when he was appointed in 2005. He had master degrees in physical education and educational psychology. He was further trained as a sport psychologist and participated in the Post Graduate Sport Psychology Curriculum (Wylleman, Harwood, Elbe, Reints, & de Caluwé, 2009). Finally, his professional education was complemented by extensive training in crisis intervention (Certificate of Advanced Studies in Crisis Intervention). The sport psychologist has a background as a high performance athlete in military pentathlon: He was a long-time member of the Swiss national team and competed at the highest international level (World and European Championships).

Data

The sport psychologist kept a diary, in which he recorded his daily meetings, interventions and personal experiences. If

conditions did not allow him to take notes immediately, he took notes later in the day. At a later stage, the sport psychologist recorded all intervention data (interventions lasting for more than 15 min) to an Excel file to be able to report his work to the NOC. These day reports have been systematically analysed for this paper. All planned and scheduled interventions were labelled as formal interventions. All unplanned and non-scheduled contacts lasting more than 15 min concerning a psychological issue were labelled as informal interventions (brief contact interventions). Generally, the athletes and coaches sought contact with the sport psychologist on their own. When the physician advised the athlete in a medical consultation to seek psychological counselling, contact was made by the medical doctor. The decision to log a contact as an intervention was sometimes ambiguous. Small talk was differentiated from an intervention based on the subjective judgement of the sport psychologist as to whether he was approached in his role as sport psychologist. Thus, when he felt that a contact was made out of personal interest, he did not log it as an intervention. Daily meetings of the medical team and of the executive board (Vancouver) were not counted as interventions. From the 2006 Olympic Winter Games in Turin onwards, the sport of the clients was recorded. For the 2008 Olympic Summer Games in Beijing and the 2010 Olympic Winter Games in Vancouver the name, sex and intervention issues were recorded as well. The logging of the onsite work started with the departure from Switzerland to the Olympic venues and ended with the arrival in Switzerland after the end of the Games.

Procedure

The day reports were analysed by the first author of this paper. All single interventions were treated as individual cases. In all cases, the sport, the intervention form (formal/scheduled and planned vs. informal/brief contact intervention), the client group (individual athlete, team, coach/head coach, member of medical team, executive board member or others), the intervention issues (maximum of four issues per intervention) and the client's name and sex were included. To establish meaningful intervention categories, the intervention issues were labelled using the success and failure factors identified in previous studies by Schmid (2005a, b). Factors that were not relevant during the Games, for example, "alterations in the familiar training concepts in the season leading up to the Olympic Games", and factors that did not emerge as relevant for Swiss athletes in previous studies (Schmid, 2005a), for example, "spectators/crowd behaviour at the Olympics", were not included in the raw categories. Twenty-five out of the original 33 relevant success and failure factors were used for possible categorisation. This list was completed with six additional themes emerging from previous reports from sport psychology practitioners about their experiences and issues raised at the Games (Hodge, 2010; McCann, 2008; Mellalieu et al., 2009). These were "competition debriefing", "critical incidents" (any event that causes an unusually strong emotional reaction that has the possibility of interfering with the ability to function normally), "social/personal issues" (issues that arise directly from the athlete's personal life), "nutritional issues" (psychological distress stemming from dieting or nutritional demands), "injury/illness" (distress that arises from fear of injury/illness, injury/illness itself or psychological dysfunctions, such as depression) and "non-specific performance issues" (stressors that arise directly from the competition, but are very broad and could not be summarised under the other raw categories). For the purpose of verification and trustworthiness, labelling consensus between the first and second author (the official sport psychologist of the Swiss Olympic team) of the present paper was sought. Using the aforementioned framework for organisational stress (Fletcher & Hanton, 2003; Hanton et al., 2005; Mellalieu et al., 2009), these raw themes were clustered into higher-order themes. In turn, the higher-order themes were categorised under four dimensions or first-order dimensions of greatest generality. This selection was based on the literature (Fletcher & Hanton, 2003; Hanton et al., 2005; Mellalieu et al., 2009): (1) "general performance issues" (competitive stressors pertaining directly to competitive performance), (2) "specific Olympic performance issues" (competitive stressors pertaining primarily to the uniqueness of the Olympic competition), (3) "organisational issues" (organisational stressors pertaining to the sport environment in which the performer is primarily operating) and (4) "personal issues" (stressors pertaining directly to the individual, his or her personal history and the personal or private environment to which the athlete primarily relates).

Data analysis

To explore the frequency of interventions, types of interventions and client groups, descriptive statistics were used. Due to the categorical character of most of the variables, a series of chi square analyses were performed to examine the associations between variables. Where appropriate, odds ratios (*OR*) were calculated to present easily interpretable measures of effect size. To decide whether there are differences between the results for the provision of onsite sport psychology services at the three respective Olympics, odds ratios were used.

Results and discussion

Number of interventions, type of services and client groups

The number of interventions for all three Olympic Games is presented in Table 1. Not included in these statistics are the daily meetings the official sport psychologist had to attend: the meetings of the medical team from 6:00 to 6:30 am (Turin, Beijing and Vancouver) and the meetings of the executive board in Vancouver (6:30 to 7:00 am). The number of interventions increased from 40 interventions at the Olympic Games in Turin to 102 in Beijing and 70 in Vancouver. This corresponds with an average of 2.1 interventions per day in Turin, 4.6 interventions in Beijing and 4.0 interventions in Vancouver. The number of daily interventions ranged between 0 and 9 for the three Olympics. In Beijing 2008, owing to contact with infected athletes, the sport psychologist was quarantined for 2 days, so he could perform no interventions or only minor ones using Skype and a phone. In Beijing, 22 athletes, 16 coaches and 3 medical personnel sought sport psychology support, in contrast with the 20 athletes, 10 coaches and 2 members of the medical staff in Vancouver. As the number of accredited athletes, coaches and medical staff differs from Games to Games, the pertinent numbers are also presented in Table 1.

We interpret the increase in the number of daily interventions as an indicator of the enhanced acceptance and the quality of onsite psychological services. This interpretation is supported by formal evaluations of the Games in Turin (Schmid, 2006) and Beijing (Swiss Olympic Association, 2008). Although the number of daily interventions at the Olympics in Beijing and Vancouver are comparable, the ratio of athletes, coaches and medical staff who used sport psychology services were not. This is probably due to the traditionally larger Swiss delegation at the Winter Games and the sport psychologist's shorter presence at the Winter Games. Another reason might be that with two Olympic villages (Vancouver and Whistler), the sport psychologist was much less visible or approachable for a substantial number of athletes and coaches. However, at 25% (Beijing) and 11% (Vancouver), a significant

Table 1
Parameters of the provision of onsite sport psychology services to the Swiss Olympic team at the Olympic Games in Turin 2006, Beijing 2008 and Vancouver 2010.

	Olympic Games		
	Turin 2006	Beijing 2008	Vancouver 2010
Days at the games[a]	19	22[a]	18[b]
Accredited persons[c]			
Athletes	130	87	146
Coaches	No data	57	110
Medical staff	No data	17	28
Total	No data	161	284
Individuals using sport psychology services			
Athletes	No data	22	20
Coaches	No data	16	10
Medical staff	No data	3	2
Total	No data	41	32
Persons using sport psychology services as a %			
Athletes	No data	25%	9%
Coaches	No data	28%	9%
Medical staff	No data	18%	7%
Total	No data	25%	11%
Sports using SP services (sports present)	12 (13)[d]	10 (24)[d]	9 (14)[d]
Relative number of sports	1.08	2.40	1.56
Number of interventions (formal %/informal %)	40 (60%/40%)	102 (48%/52%)	(56%/44%)
Interventions per day			
M	2.1	4.6[a]	4
SD	1.0	2.5[a]	1.4
Range	1–5	0–9[a]	1–6
Intervention quantity per individual			
M	No data	3.1	3
SD	No data	2.5	2.1
Range	No data	0–9	1–9

[a] Due to contact with an ill athlete the sport psychologist was 2 days in quarantine.
[b] Due to an incident in the sport psychologist's family he returned home before the official games' end.
[c] Accreditations without technical personnel.
[d] Number of sports of the Swiss delegation competing at the games.

proportion of the delegation members consulted the sport psychologist, which underlines the importance of sport psychology services. The number of interventions per individual (athletes, coaches or members of the medical staff) averaged three sessions for both Beijing and Vancouver. Number of contacts ranged between 1 and 15 occasions, demonstrating that some athletes had a very intense professional relationship with the service provider. The number of daily interventions, which ranged between 0 (due to medical quarantine) and 9 per day, also indicates that onsite work cannot be scheduled in as in other settings.

The ratio between formal, scheduled and planned interventions on the one hand and informal, unplanned brief contact interventions on the other hand ranged between 60% and 40% (Turin), 48% and 52% (Beijing) and 56% and 44% (Vancouver). This shows that brief contact interventions have been a cornerstone in the delivery of sport psychology services for the Swiss Olympic team. The findings highlight the importance this counselling method has in the context of the Olympic Games and underlines that sport psychologists working at the Games should learn to perfect "the ski-lift consult, the bus-ride consult, the 10-minute breakfast table teambuilding session, and the confidential session in public places such as hotel lobbies, parking lots, and trainers' tables" (McCann, 2000, p. 211). Contrary to the concept of brief counselling interventions proposed by Giges and Petitpas (2000), our analyses revealed that multiple, rather than single, issues were discussed in a single intervention session. This might be due to the significance and urgency the client and sport psychologist ascribed to the issues in the hour before competition. Therefore, they tried to tackle all issues raised.

The official sport psychologist for the Swiss Olympic team provided individual sessions for athletes, coaches and members of the medical staff, group sessions for athletes and coaches and competition observations, including feedback to athletes and coaches. For the 2008 and 2010 Olympics, Table 2 shows a breakdown of the frequency of each type of services subdivided into the aforementioned client groups. Individual sessions with athletes were the most frequent form of intervention in Beijing (40%) and in Vancouver (41%). Individual sessions with coaches or head coaches were the second most frequent intervention (Beijing: 38% and Vancouver: 27%) followed by group sessions (Beijing: 13% and Vancouver: 19%). A small proportion of interventions were also held with other persons, such as athletes' family members. These findings support Hodge's (2010) notion that coaches constitute a substantial proportion of clients. However, athletes are still the largest client group. The considerable number of group sessions highlights that sport psychologists working at the Games need to have group managing and group counselling skills. Another form of service was competition observations (around 6%), emphasising the need for behavioural observation skills as well. Consequently, applied practitioners working at the Olympics may need to broaden their competencies to work with coaches and to undertake behavioural observations in the competition setting.

Intervention issues

Fig. 1 depicts all intervention issues raised in the provided onsite sport psychology services during the Games in Beijing and Vancouver. A total of 170 issues were raised in 102 interventions in Beijing, and 159 themes were discussed in the 70 interventions in Vancouver. The analysis of these issues supports the findings of previous studies that the perceived stressors at the Olympics are complex or, at least, multiple. In the Olympic context, where coming fourth is often regarded as a failure, "general performance issues" are the ones most frequently addressed by athletes and coaches at the first-dimension level. In Beijing, approximately 75%

Table 2
Type of services provided to different client groups of the Swiss Olympic team at the Games in Beijing 2008 and Vancouver 2010.

Type of service	Beijing 2008		Vancouver 2010	
	Frequency (formal/informal)		Frequency (formal/informal)	
	n	%	*n*	%
Individual sessions with athletes	39 (17/22)	40% (17%/23%)	29 (18/11)	41% (26%/16%)
Group sessions with athletes (and coaches)	13 (10/3)	13% (10%/3%)	13 (9/4)	19% (13%/6%)
Sessions with coach/head coach (mostly individual sessions)	37 (18/19)	38% (14%/14%)	19 (7/12)	27% (10%/17%)
Sessions with medical staff (individual sessions)	3 (0/3)	3% (0%/3%)	2 (1/1)	3% (1%/1%)
Competition observation	5 (4/1)	5% (4%/1%)	6 (4/2)	9% (6%/3%)
Others	5 (0/5)	5% (0%/5%)	1 (0/1)	1% (0%/1%)
Total	102	100%	70	100%

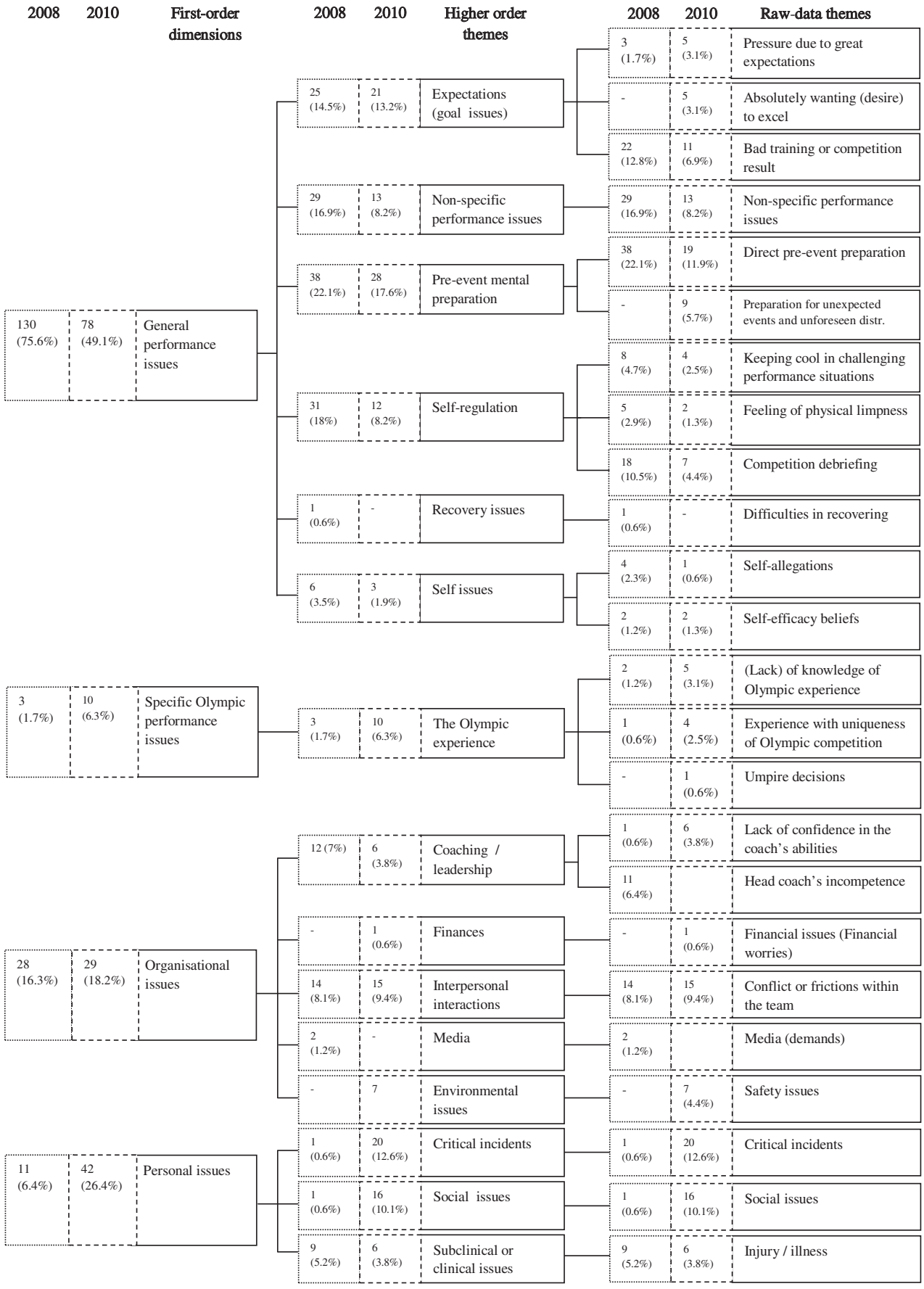

Fig. 1. Number and percentages of intervention issues raised in the sport psychology services in Beijing 2008 and Vancouver 2010 for raw themes, categorised higher order themes and categorised first-order dimensions. Raw data themes with no entry ("high coach expectations"; "nervousness"; "sleep onset and sleep-maintenance difficulties"; "controversies regarding best training"; "lack of familiarity with competition venues"; "climatic conditions" and "nutritional issues") have been omitted in the figure. – indicate no entry in the respective games.

of the intervention issues related to this category; in Vancouver, however, this percentage was around 50%. Self-regulation, direct pre-event mental preparation and expectations/goal issues are the most common themes within this category. Athletes and coaches seem to be caught up in the pressure and high expectations – issues that may best be addressed by identifying specific process goals separately from the overwhelming outcome goals at the Games. In contrast, self issues (self-allegation and self-efficacy) and recovery issues were seldom addressed.

But do athletes and coaches seek consulting for other than performance issues right before their potentially career culminating competition? In Beijing, 6% of the interventions were regarded as "personal issues" and in Vancouver 26%. This difference is because of the higher percentage of "critical incidents" (13%) and social issues (10%) such as the death of a close person arising at the Games in Vancouver. The rate for "organisational issues" was comparable in Beijing (16%) and Vancouver (18%). Within this category, "conflicts or frictions within the team" were addressed at just under 10%, and "lack of confidence in the coach's ability" or "head coach's incompetence" were relatively frequent (7% and 4%, respectively) in being identified as issues. In terms of the higher-order themes and the raw-order themes, "specific Olympic performance issues" were seldom discussed (2% for Beijing and 6% for Vancouver). Within the "general performance issues" dimension, "pre-event mental preparation", "expectations" and "self-regulation" were raised relatively often.

Regarding the ratio between competitive and organisational stressors apparent in elite athletes, the analysis reinforces Mellalieu et al.'s (2009) findings that in the hour before competition the perception of organisational stressors is reduced and the perception of competitive stressors enhanced. It is likely that because of the temporal proximity to their competition athletes seem to try to focus their attention predominantly on their performance delivery. In this study, less than 20% of interventions were due to organisational stressors. However, one can assume that if perceived organisational stressors are impacting an athlete's performance, he or she will seek counselling. Conflicts within the team and lack of confidence in the (head) coach's abilities were identified as the most common organisational stressors. The relationship between any athlete and his or her coach and team functioning seem to be critical factors for athletes to be able to believe in their ability to fulfil their own potential. Therefore, these issues need to be immediately tackled to smooth the road to success.

Some of the abovementioned results deserve further examination. For example, in light of Schmid's (2005a) findings, it is perhaps surprising that specific Olympic performance issues (as well as recovery issues) have been seldom addressed in sport psychology consultations. This absence of discussion might be because these issues have already been explored in manuals, brochures and pamphlets for athletes and coaches provided by the Swiss Olympic Association for all three Olympics in question (e.g., Birrer, 2009; Birrer & Wetzel, 2009). In a formal evaluation, athletes stated that the information provided was relevant and informative (Schmid, 2006).

The fact that coaches constitute an important client group raises the question of whether coaches and athletes share the same consulting issues. The data suggest that there is no difference between coaches and athletes with regard to frequency of consulting except for Beijing, where coaches were nearly two times more likely to raise organisational issues than athletes ($OR = 1.88$) and for Vancouver, where coaches were more than three times more likely than athletes to discuss an organisational issue ($OR = 3.65$). Given the specific demands of these two client groups, the issue difference makes sense. For coaches, the challenge is to organise everything around their athletes to enable them to compete at their highest possible level, whereas for athletes the challenge is mainly on the competition side.

Effects of previous collaborations

Do previous collaborations between a sport psychologist and a client influence the probability to seek onsite support at the Olympic Games? In fact, a significant association between earlier collaboration with the sport psychologist and whether clients would seek his service (again) was found with $\chi^2(1, N = 163) = 54.65$, $p < .001$ in Beijing 2008 and $\chi^2(1, N = 258) = 66.15$, $p < .001$ in Vancouver. This effect is quite large, as the Phi values show (Beijing: $\Phi = .58$; Vancouver: $\Phi = .51$). Based on the odds ratios, athletes or coaches who worked before the Olympics with the sport psychologist were 52 (Beijing) and 12 (Vancouver) times more likely to approach him for consultancy. Previous contact with the sport psychologist was also associated with the issues raised in the interventions. Chi square statistics show a significant association between earlier collaboration and the first-order dimensions in our study for Beijing ($\chi^2(3, N = 172) = 13.51$, $p < .01$) and for Vancouver ($\chi^2(3, N = 159) = 31.84$, $p < .001$). For Vancouver, no significant association was found between previous contact and "specific Olympic performance issues" ($\chi^2(1, N = 159) = .10$, $p = .75$) and previous contact and "organisational issues" ($\chi^2(3, N = 159) = .20$, $p = .66$). However, for Vancouver, previous contact seemed to have a significant association with "personal issues" raised as an intervention theme by athletes ($\chi^2(3, N = 159) = 28.11$, $p < .001$) and "general performance issues" ($\chi^2(1, N = 159) = 18.74$, $p < .001$) as an intervention theme: In the case of a "personal issue" (e.g., a critical incident), athletes or coaches who did not work with the sport psychologist before the 2010 Olympics were seven times more likely to approach him than athletes or coaches without previous collaboration with him. The opposite seems to be true for "general performance issues": athletes or coaches who worked with the sport psychologist before the Vancouver Games were 4.5 times more likely to approach him because of a "general performance issue". However, the chi square analyses for Beijing showed no association between previous collaboration on the one hand and "general performance issues" ($\chi^2(1, N = 172) = .50$, $p = .48$) and "organisational issues" ($\chi^2(1, N = 172) = 1.37$, $p = .24$) on the other. On the contrary, there seems to be an association between previous collaboration and "specific Olympic performance issues" as well as personal issues raised in the intervention (such as the death of someone close). Still chi square assumptions were not met because several expected frequencies were below five. Therefore, those results are not detailed here. Finally, previous contact with the sport psychologist had no influence on whether the interventions were planned (Beijing: $\chi^2(1, N = 102) = 1.78$, $p = .18$, $\Phi = -.13$; Vancouver: $\chi^2(1, N = 70) = .43$, $p < .52$, $\Phi = -.08$).

From an applied perspective, these findings highlight the importance of sport psychologists' working with the athletes before the Olympics so that they can help a considerable number of athletes to successfully cope with competitive stressors faced at the Games. The findings are not consistent though. They suggest that previous collaboration might be an influencing factor for clients to approach the sport psychologist. Yet previous collaboration is not a requirement, especially if the support-seeking person's reason is a critical incident or another personal issue with significant consequences, as our analysis of the Vancouver data indicate.

General discussion

This study extends recent practise reports investigating the consultancy work of sport psychologists involved in helping athletes and coaches cope with the Olympic experience (e.g., Hodge, 2010) and achieve their best possible performance at the Games. In particular, the fact that this study investigated the sport

psychology services provided at three different Olympics allowed for the exploration of intervention differences and possible influencing factors. As other scientists have suggested (Mellalieu et al., 2009), this study distinguishes four types of challenges athletes and coaches face in light of a major sport event. The findings support Mellalieu et al.'s (2009) assertion that personal and organisational issues may indeed become a performance issue in the competition arena. Thus, as "general performance issues", "specific Olympic performance issues", "organisational issues" and "personal issues" were all relevant counselling topics in the investigated Olympic missions, sport psychologists working at the Olympic Games have to be prepared to help their clientele to cope with all abovementioned challenges.

One reason the executive board of the Swiss Olympic Association decided to integrate a sport psychologist into the onsite support staff was to have a specialist present to handle critical incidents. However, neither at the Olympics in Turin nor at the Olympics in Beijing did a major critical incident (e.g., life threatening injury within the team) take place. This might be due to a preventative effect of the work of the sport psychologist with a part of the clientele prior to the Games and at the Games itself. This interpretation is supported by the fact that in Vancouver athletes who worked previously with the sport psychologist were less likely to approach him with a personal issue. Additionally, in Beijing, only in 6% of the interventions was a personal issue the main cause. However, in Vancouver, the fatal accident of a Georgian luge Olympian, eye-witnessed by Swiss athletes and a coach, made a crisis intervention essential. Following this casualty, several Swiss bob sleighs overturned in practise runs, and one athlete was severely injured and fortunate to escape permanent disability. These events also led to 4% of the themes in Vancouver concerning health issues, as some athletes doubted the security of the bob run. Such situations are ethically challenging for the sport psychologist, who has to take responsibility for how much he can push an athlete to overcome pain and fear. The handling of a crisis can generally not be put off until later, and the sport psychologist needs to deal with the immediate problem and prevent potential future ramifications (McCann, 2008). Consequently, resources are tied up, and the sport psychologist may not be available for athletes with performance issues. This is reflected in the decrease in interventions at the Vancouver Olympics, with performance issues being under 50%. This must be considered in the provision of an effective onsite psychological service, and back-up plans need to be prepared in advance.

While critical incidents are stressful for the sport psychologist, too, other factors make the onsite work even more stressful, for example, the limited time frame that the Olympic setting offers for interventions, the transport, security and organisational difficulties at the Games (Hodge, 2010) or the many interventions per day. All in all, a 14-hour working day is more the rule than the exception for a sport psychologist at the Olympics. Additionally, Olympic Games usually take longer than World Championships. Considering the time for acclimatisation, an Olympic mission may therefore take 20 days or longer. This can also be an additional source of strain for a sport psychologist. In sum, Olympic Games are an unrivalled challenge for not only athletes and coaches but also sport psychologists. The expectations are for all, the sport psychologist included, extremely high. All participants take the Games and the Olympic competition extremely seriously. Above all, the sport psychologist often fulfils multiple functions. For example, he is not responsible for one single team but for several. Moreover, one moment his services might be requested at a flower ceremony for an athlete with whom he is working, and the next moment he has to conduct a crisis intervention with athletes/coaches from another sport. All things considered, the factors that make the Olympic Games exceptional for athletes and coaches apply for the sport psychologist, too.

Another challenge might be the attitude of the national sporting bodies. Some NOCs argue that onsite consultancy cannot be successful unless the sport psychologist and his or her clients have worked together prior to the Games. And since in a medium-sized Olympic team, a large number of sport psychologists might be involved in the preparation of athletes, many sport psychologists should be integrated into the onsite support team – an idea that is unfeasible given the restricted number of accreditations allotted to an official delegation. While this reasoning has some appeal, this study demonstrates that a previous collaboration is not a prerequisite for successful onsite support, especially if the intervention request is a "personal" or "organisational issue". Furthermore, psychologists are trained to build up a professional relationship by creating a safe, confidential atmosphere and mutual trust.

Another argument often raised is that there should be no need for onsite sport psychological support because if so, the athlete or coach would not have been well prepared prior to the Games. Beyond doubt, preparing for the Olympic challenge is a long-term process. But again, critical incidents, personal crises or even performance slumps due to perceived pressure can always occur and become performance factors. In these cases, the onsite sport psychology service could support long-time psychological preparation. An anecdotal example to support this statement is the story of the male curling team from the 2010 Olympics. After a series of bad games with a huge performance slump, the team recovered after several interventions and finally won the Olympic bronze medal.

These thoughts lead to reflections on best-practise models for onsite sport psychology service delivery. Since crisis situations, which require some sort of onsite specialist intervention, will almost inevitably occur, integrating a well-trained sport psychologist in the NOC delegation is prudent. The sport psychologist's duty could include providing support to the executive board, being available for crisis situations and helping athletes and coaches with performance issues. As not all athletes and coaches can profit from such a service because of the sport psychologist's limited time resources, a NOC might consider integrating additional sport psychologists who were already working in the support team of selected federations in the years leading up to the Games. This might be a particularly good solution for federations which have private external accommodations to reduce the travelling from the Olympic village to their competition and training venues. For this purpose, the sport psychologist must have full access to the Olympic village(s) and competition sites. This might be guaranteed with day accreditations. The assignments for these sport psychologists are limited to the time the competition lasts for the relevant sport. This solution allows more athletes and coaches to profit from sport psychology services. Additionally, doing so might guarantee that in the case of crisis intervention the "back-up" psychologist can work with their federations on performance issues.

Conclusions

In this paper, we explored the onsite sport psychology service of an official sport psychologist responsible for the service provision of a small country's Olympic delegation. One of the most important conclusions from this analysis is that the sport psychologist is fully involved with daily interventions (*not counting* staff meetings) and ideally but not necessarily should have had a long-term relationship with the clients in order to have an impact on general performance issues, particularly in the case of a team. Therefore, the assigned practitioner has to be able to work under pressure. However, athletes and coaches will address personal or organisational issues, whether they have worked with the sport

psychologist before the Games or not. Critical incidents of any kind require substantial resources from the sport psychologist. This, in turn, limits the resources available for the onsite support of other athletes and coaches and will severely handicap a sport psychologist's chances of creating a performance impact, which usually is the main reason for a NOC to include a sport psychologist in the onsite support team. Furthermore, the logistical prerequisites of the Olympic Games will constrain the impact of the sport psychology services, for example, when there are different Olympic villages and the consultant is working without the accreditation to allow for access to the clients. NOCs are well advised to consider these facts when specifying sport psychologists' functions and planning their assignments. The Swiss Olympic Association, for example, might increase their sport psychology support staff for the 2012 Olympics with a sport psychologist mainly responsible for the executive board and critical incidents, and consultants, previously working with the respective sports, mainly present for performance issues. This will also be advantageous in terms of having colleagues around for peer consultation or "back-up", e.g., in case of illness.

The findings of this study further highlight some important considerations for the training of sport psychologists (see also Wylleman et al., 2009) who are to work for a delegation at the Games. It is likely that the sole use of psychological skills training will prove rather ineffective in tackling many of the issues with which participants are confronted. Applied practitioners working at the Olympics need to broaden their competencies to do justice to their clients and the issues they could potentially face. Thirty per cent of the clients might be coaches, 50% of the interventions might be brief counselling interventions and a considerable share of the issues might be related to conflicts or frictions within the team. Additionally, critical incidents will likely occur, and the sport psychologist should be capable of handling them. All this has to be integrated in the training for sport psychologists delivering services at the Games. The continued professional development initiative 'Psychological Excellence for Elite Performance' (PE4EP) developed by the European Sport Psychology Federation (FEPSAC) on the topic of conflict and crisis management in elite and Olympic sport (FEPSAC, 2012) as well as the Forum of Applied Sport psychologists in Topsport (FAST) (Wylleman et al., 2009) anticipated this need in applied sport psychologists.

Although this paper provided some insights into the onsite work of a sport psychologist acting at the Olympics, it can only serve as a starting point for future debate and research. Further research is needed to evaluate the onsite work of a consultant and the relative impact of the different forms of interventions, for example, whether a consultant in brief counselling interventions should concentrate on the solution of just one issue raised or how well a single sport psychologist can cope with the amount and duration of onsite work at Olympic Games.

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Anhang C

Mindfulness
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REVIEW

Mindfulness to Enhance Athletic Performance: Theoretical Considerations and Possible Impact Mechanisms

Daniel Birrer · Philipp Röthlin · Gareth Morgan

Abstract Top athletes face various challenges in their career on and off the sports field. Sport psychologists teach techniques to help athletes to cope with these challenges. Over the last 30 years, the techniques used stem mainly from psychological skills training (PST), which is influenced mainly from cognitive-behavioral theories. Recently, interest in mindfulness-based interventions has increased in sport psychology. This article identifies the limits of PST and presents theoretical considerations how mindfulness-based interventions can amend PST. Further, it addresses in what form and by what mechanisms athletes could benefit. In reviewing current mindfulness literature, we conclude that it is important to distinguish between mindfulness practice and dispositional mindfulness. Mindfulness practice means the methods through which mindfulness is fostered, whereas dispositional mindfulness describes the tendency to be mindful in everyday life. In our conceptualization, we differ between three interwoven facets of mindfulness practice (intention, attention, and attitude), which are associated with six components of dispositional mindfulness. We consider that athletes with a higher degree in mindfulness practice and dispositional mindfulness will enhance the level of several required psychological skills through various impact mechanisms. Based on theoretical considerations, we suggest bare attention, experiential acceptance, values clarifications, self-regulation/negative emotion regulation, clarity about one's internal life, exposure, flexibility, non-attachment, and rumination as possible impact mechanisms. A greater knowledge of the conceptualization of mindfulness and its impact on psychological skills could develop and improve the effectiveness of mindfulness based interventions in sports.

Keywords Mindfulness · Sport · Performance enhancement · Psychological skills training

Introduction

Roger Federer, one of the most successful tennis players ever, lost the 2011 US Open Semi-Final in five sets, 6–7, 4–6, 6–3, 6–2, 7–5. When the score was 5–3, 40–15 in the last set, he gave away two match points on his serve. After the match, he described this situation in the following way: "At first I thought, okay, now I have done it. Before the match ball, I was very nervous because of joy that everything went so well. Fifteen minutes later, you leave the court and did not win the match. To lose in such a way is very disappointing because I had the feeling that he [Novak Djokovic] was already beaten in the head and no longer believed in his victory." This example shows that even at the highest performance level in sports, dysfunctional thinking, which can become ruminative, can occur. Although dysfunctional thinking does not reach a clinical level and might not be problematic in another context, in the unforgiving environment of elite sports, dysfunctional thinking can be performance relevant.

By teaching psychological strategies, sport psychologists try to assist athletes in coping with this and other challenges. The use of psychological strategies enhance athletes' chances of performing at their highest level under very demanding, stressful, and sometimes even hostile conditions. In this context, mindfulness-based interventions have drawn attention from a handful of sport psychologists. Kabat-Zinn and colleagues

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were perhaps the first to report the application of this approach in sport (Kabat-Zinn et al. 1985). He provided training in mindfulness meditation to rowers. This article outlines theoretical considerations for how mindfulness-based interventions can fruitfully amend psychological skills training (PST) in sports.

Psychology of High Performance—Nonpathologic Inhibitors and Facilitating Processes

Mindfulness is increasingly being used in clinical psychology, and the salutary effects have been impressively documented under a range of conditions (Hofmann et al. 2010; Chiesa and Serretti 2010). The scientific evidence of the efficacy of mindfulness-based interventions is so broad that it has been proposed as a common factor across several schools of psychotherapy (Martin 1997). However, athletes are commonly psychologically and physiologically healthy; thus, the possible benefits of mindfulness-based interventions need justification. Therefore, as the first step in demonstrating the efficacy of mindfulness-based interventions for athletes, understanding the psychology of high performance is important.

High performance can be undermined by non-pathologic psychological inhibitors, yet be promoted by an optimal psycho-physiological state. Among others, performance inhibitors include unrealistic expectations because of a perfectionistic personality (Hill et al. 2011) or an injury (Gardner and Moore 2007), competition anxiety (Hardy et al. 1996), anger and other negative emotions (Hanin 2000), fear of failure (Elbe et al. 2003), perceived pressure (Beilock and Gray 2007), and avoidance behavior (Jordet and Hartman 2008). These inhibitors predominately influence performance in competition. However, other factors can influence performance negatively. These include personal factors as an avoidance coping style (Hanson et al. 1992) or internal failure attribution (Biddle et al. 2001) as well as environmental factors such as overtraining (Meeusen et al. 2006; Jones and Tenenbaum 2009), interpersonal problems, or life-balance difficulties (Hardy et al. 1996). In contrast, Hardy and colleagues (1996) proposed an excellent performance is facilitated by a psycho-physiological state characterized by automatic goal-focused processes. During performance, athletes ideally adapt the relevant aspects of their behavior automatically to the specific situational demands (Gardner and Moore 2007). This process is called discrepancy adjustment and is comparable to airplane autopilot (Wells 2000). This mostly automatic process (Carver and Scheier 1988; Sbrocco and Barlow 1996), consisting of self-monitoring, self-evaluating, and adjusting behavior, is essential for regulating behavior effectively (Gardner and Moore 2007). However, because sports are multifaceted, there is a huge difference in the physical and psychological demands of different sports. Therefore, identifying the specific demands of each sport is essential in deciding which processes or psychological skills facilitate performance-relevant automatic goal-focused processes.

Promoting High Performance—Requirements, Skills, and Techniques

Recently, Birrer and Morgan (2010) introduced a model for deducing the specific psychological demands of a specific

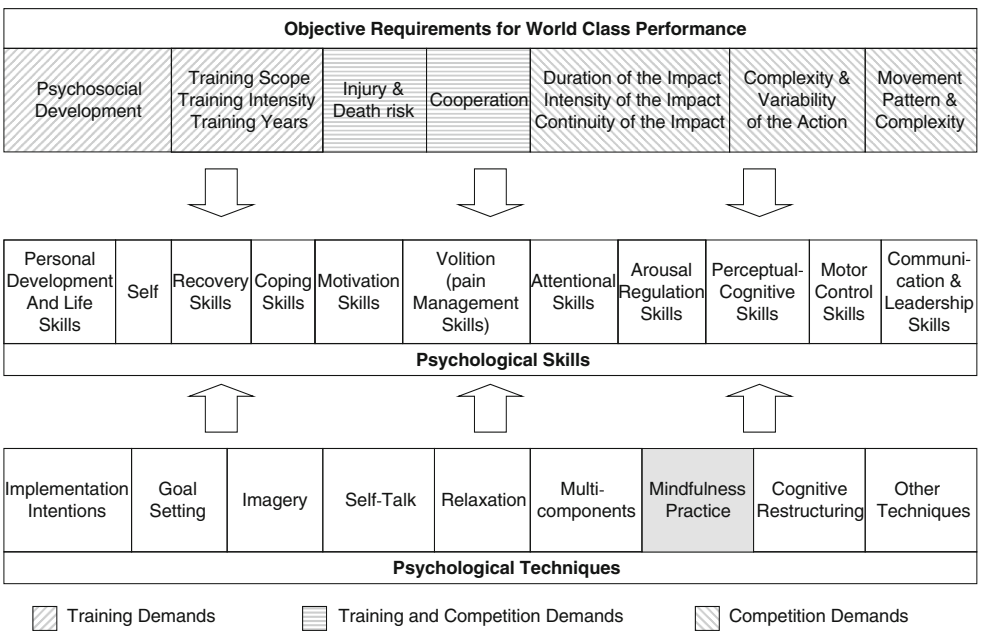

Fig. 1 Potential psychological skills to cope with the psychological requirements for world-class performance

sport (Fig. 1). They provided reasoning for high performance requiring not only specific skills for elite competitive performance but also specific skills for the often strenuous and long-term training process. The proposed model consists of three conceptual layers: requirements, skills, and techniques.

Requirements

The first layer describes the possible categories of objective (psychological) requirements an athlete has to meet in different sports. Demands from competition itself incorporate the *duration*, *intensity*, *and continuity of the impact*, the *complexity and variability of the action*, and the *movement pattern and movement complexity.* Demands stemming from the lengthy training process and lifestyle to reach an elite performance level incorporate *training scope*, *training intensity*, and *years of training* to become an expert in the corresponding discipline and the *psychosocial development* that each sporting and non-sporting individual needs to fulfill. Finally, demands stemming from both competition and training processes are incorporated in *injury and death risk* in the relevant sport and the *cooperation between the athlete and all members of the party* needed to fulfill the task. The requirements dictate the psychological skills crucial for successfully coping with the specific demands of the relevant sport.

Skills

Consequently, the second layer provides psychological skills, which are hypothesized as helping to regulate an athlete's behavior to meet the requirements of a specific sport. In this context, a skill is the learned capacity or ability to carry out a specific task. These skills are *attention*, *motivation*, *volition*, *arousal regulation*, *perceptual cognitive functions*, *motor control*, and the various "self" constructs (e.g., self-awareness, self-efficacy, self-worth, self-confidence) known as *self skills*, as well as *personal development* and *life skills*, *coping skills, communication* and *leadership skills*, and finally *recovery skills.* Birrer and Morgan (2010) followed the differentiation, suggested by Vealey (2007) and Seiler and Stock (1994), between psychological skills as desired outcome (e.g., increased self-confidence and enhanced attentional focus) and psychological techniques (e.g., imagery and self-talk) as the means to promote the desired outcomes through the systematic application of these techniques. In this context, a technique is the procedure used to enhance a skill needed to manage the requirements.

Techniques

The third layer of the model comprises the techniques suitable for fostering the required psychological skills. Vealey (2007) named *imagery*, *goal-setting*, *self-talk*, and *physical relaxation techniques* as the four basic mental techniques predominantly used in sports psychology interventions, supplemented with *multimodal psychological skills training*, which incorporates a combination of these basic techniques. However, numerous additional techniques are used to enhance an athlete's psychological skills, e.g., cognitive restructuring. Birrer and Morgan (2010) adopted these basic techniques in their model and added mindfulness-based interventions as a further important technique promoting psychological skills so that athletes can meet the requirements for a successful career. Mindfulness is a multifaceted concept. Therefore, it is expected that mindfulness-based interventions will influence the psychological functioning of elite athletes via numerous impact mechanisms. More comprehensive than Birrer and Morgan (2010), we believe these interventions have to be seen more as a meta-technique than a "simple" psychological technique.

Traditional Psychological Skills Training in Sports and Possible Limitations

During the last 30 years, the psychological techniques predominately used to enhance athletic performance have stemmed mainly from psychological skills training (PST), which is influenced mostly by cognitive-behavioral theories (Meichenbaum 1977). This approach involves developing self-control of internal states such as thoughts, emotions, and physical experience to enhance performance. Scientific evidence has shown the efficacy of PST. Many studies demonstrate that PST decreases negative internal states, such as performance anxiety, and increases positive internal states (such as self-confidence, e.g., Daw and Burton 1994). However, only a few studies have revealed a clear performance-relevant impact of these internal state changes (see Gardner and Moore 2006; Moore 2009, for a review). Evaluating the efficacy of an intervention with a target group of elite athletes is difficult. Samples of elite athletes are small, and it is very difficult and ethically questionable to persuade athletes and their coaches to be part of a control group. Nevertheless, many athletes seem to experience difficulty in controlling their cognitive processes by employing traditional PST methods. The usefulness of these methods seems limited.

Two theories may explain why athletes cannot successfully control their cognitive processes despite investing in the mental effort: the theory of ironic mental processes of mental control (Wegner 1994; Janelle 1999) and the theory of reinvestment (Masters 1992).

The theory of ironic mental processes explains the "tendency to feel, act, and think in ways that are opposite to the intended direction of emotion, behavior, and cognition"

(Janelle 1999, p. 202). Two processes are important in the attempt to control one's own mental processes (Wegner 1994): (a) an intentional operating process, which facilitates the desired outcome by the conscious and effortful search for mental content, which is consistent with the desired outcome, and (b) a monitoring process that checks if the operating process is still needed by automatically and unconsciously searching for signs of failures to produce the desired outcome. It is hypothesized that the operating process needs more cognitive capacity and has more influence than the monitoring process. Additionally, the monitoring process usually functions to activate the operating process. In circumstances of reduced cognitive capacity, such as stress, time urgency, mental overload, or distraction, the monitoring process may supersede the operating process because it is easier to access. Therefore, the sensitivity to signs of mental states that are least desired or the opposite of the desired outcome is enhanced. Ironically, these individual attempts to gain mental control may cause the undesired outcome the athlete was trying to avoid. Golfers often experience this phenomenon when trying to avoid driving the ball into a water hazard. Because the golfer tries so hard to avoid the hazard, the ball often splashes into the water.

Ironic mental processes are predominately associated with the deliberate self-control of psychological states or processes (thoughts, emotions, bodily sensations, and behaviors), mostly to attain personal goals. The performance-decreasing effect of this phenomenon is hypothesized as caused by the focus on non-task-relevant cues (thoughts and feelings; external targets to be avoided). Athletes who experience task irrelevant feelings or thoughts might try to deliberately invest mental effort in focusing on task-relevant information or the processes most relevant for executing the task. Psychologists usually refer to these attempts as concentration. Sport psychologists try to enhance athletes' concentration by teaching them psychological techniques such as specifying action goals, pre-performance routines, self-talk (trigger words), and imagery (Moran 2010). Consciously putting more effort in task execution might be performance relevant. However, scientific evidence supports the performance-decreasing effects of such attempts (e.g., Masters and Maxwell 2008). Further, some findings suggest that ironic mental processes are associated with performance-decreasing attention processes, more precisely athletes' gaze behavior (Binsch et al. 2009, 2010).

Ironic mental processes can be regarded as detrimental self-regulatory behaviors associated with conscious control of thoughts, emotions, or bodily sensations. Self-regulatory detrimental behaviors associated with conscious control of movement have been united under the umbrella term reinvestment (Masters 1992). Reinvestment processes are activated whenever an athlete's self-evaluated performance does not match his or her expected performance. This discrepancy can be in either an unexpected poor performance or an unexpected good performance. In this case, self-regulation is enhanced and tends to initiate discrepancy reduction efforts (Carver and Scheier 1988; Sbrocco and Barlow 1996). Reinvestment theory states that automatic movement will be disrupted if the athlete tries to control it consciously with declarative knowledge (Masters and Maxwell 2008). Masters and Maxwell (2008) specified numerous contingencies that can result in reinvestment, for example, psychological pressure, adaptation of process goals, or availability of too much time.

In summary, many contingencies can trigger the reinvestment of task-relevant declarative knowledge. This has a negative impact on performance. It is suggested that reinvestment is prevented through emotion control training (Abrams 2010), an external focus of attention (Wulf et al. 2007), or the use of implicit motor learning (Masters 1992). However, reinvestment would not appear if athletes were not involved in self-evaluation processes because they are attempting to attain personal goals. Mindfulness-based interventions could help prevent the detrimental effects of ironic mental processes or reinvestment. However, these reflections imply a possible paradox of mindfulness-based interventions in top sports, namely, the disaccord (or inconsistence) of the no goal and acceptance attitude of mindfulness and the extreme win and goal orientation of high performance sport. We will address this paradox later, after briefly clarifying our understanding of mindfulness.

Facets and Components of Mindfulness Practice and Dispositional Mindfulness

Despite widespread interest across different areas of psychology in the application and effects of mindfulness, there is no common understanding of the psychological construct of mindfulness, or what facets and components the construct involves (Coffey et al. 2010). Further, what impact mechanisms are associated with it, and how these mechanisms relate to different facets and components of mindfulness and formal or informal mindfulness training, is not clear (Dorjee 2010). However, for elite athletes to benefit from using mindfulness, careful investigation of the facets and components of mindfulness and their possible mechanisms of effect is important. Therefore, a working model incorporating the basic facets and components of mindfulness will be discussed, and possible mechanisms of effect of mindfulness in the attempt to enhance athletic performance will be presented.

"Clinically oriented conceptualizations of mindfulness can confound the description of the phenomenon with the methods (practice) through which it is fostered" (Brown et al. 2007, p. 215). The commonly used definition of mindfulness as intentional, non-judgmental awareness (Kabat-Zinn

1990) was introduced to describe *mindfulness practice*. Research has shown that mindfulness practice is associated with greater *dispositional mindfulness* (a temporary more-or-less stable state or trait, the tendency to act mindful in everyday life; Brown and Ryan 2003; Baer et al. 2008). Consciously carrying over mindfulness principles or elements into everyday life can be seen as informal mindfulness practice. In this context, we believe, similar to other researchers (e.g., Bishop et al. 2004; Brown and Ryan 2003), that mindfulness may be cultivated through everyday experience or processes other than formal meditation.

To better understand the processes and principles that underlie mindfulness, several researchers have sought to clarify the concept by clearly establishing its facets. Bishop et al. (2004) pointed to two dimensions of mindfulness: *self-regulation of attention* and the *attitude of openness to experience*. Bohus and Huppertz (2006) differentiated "What" and "How" modalities. Their conceptualization comprised *observing*, *describing*, and *acting* ("what modality") in a *non-judgmental*, *concentrated*, and *effective* way ("how modality"). Shapiro and colleagues (2006) tried to break mindfulness down into a simple, comprehensible construct. This construct reflected the core components of formal mindfulness practice: *intention*, *attention*, and *attitude*. These components "are not understood as separate processes or stages—they are interwoven aspects of a single cyclic process and occur simultaneously. Mindfulness (practice) is this moment-to-moment process" (Shapiro et al. 2006, p. 375). Based on the description of mindfulness in Mindfulness-Based Stress Reduction (MBSR) and in a Buddhist context, Dorjee (2010) provided a working model with five mindfulness facets relevant to psychological and neuroscientific research: (1) *intention and context of mindfulness practice*, (2) *bare attention*, (3) *attentional control*, (4) *wholesome emotions*, and (5) *ethical discernment*.

Baer and colleagues (2006, 2008) investigated the factor structure of mindfulness by combining all items from five recently developed mindfulness questionnaires into a single questionnaire. Since most mindfulness measures quantify dispositional mindfulness, we believe that Baer and colleagues (2006, 2008) conceptualized dispositional mindfulness. Exploratory factor analysis led them to five factors for mindfulness with the following components: (1) *observe*—observing, noticing, and attending to thoughts, feelings, perceptions, and sensations; (2) *describe*—describing or labeling with words; (3) *act aware*—acting with awareness; (4) *nonreact*—not reacting to inner experience; and (5) *nonjudge*—not judging experience.

By exploring which of Baer and colleagues' (2006, 2008) mindfulness components predict psychological well-being, symptoms of anxiety, depression, and stress, Cash and Whittingham (2010) showed that the mindfulness components *nonjudge* and *act aware* were significant predictors of depression. Additionally, *nonjudge* was a significant predictor of anxiety and stress. Thus, different components of dispositional mindfulness make different contributions to psychological functioning. Coffey and colleagues (2010) complained about the lack of a clear mindfulness definition, especially about the lack of clear boundaries between different mindfulness conceptualizations and emotion regulation, in mechanisms of impact by which mindfulness components might influence mental benefits. To differentiate between mindfulness components and emotion regulation, Coffey et al. ran different exploratory, confirmatory factor analysis and structural equation models to better understand the factor structure of mindfulness and emotion regulation measures and possible impact mechanisms on psychological functioning. The researchers concluded mindfulness consists of two facets: (1) *present-centered attention* and (2) *acceptance of experience*. They suggested that other components captured in current trait measures of mindfulness are the consequence of mindfulness rather than components. A reason for this might be that the boundaries between mindfulness practice and dispositional mindfulness are not very clear. Formal mindfulness practice with bare attention, the intention to self-regulate, and a nonjudgmental and accepting attitude will enhance the disposition to act with more attention and a nonjudgmental attitude in everyday life, which, we argue, is nothing more than the trait components of dispositional mindfulness. Finally, recently Bergomi and colleagues (in press) developed a new instrument, the Comprehensive Inventory of Mindfulness Experiences (CHIME). It consists of six components: (1) *nonreactivity/decentering*, (2) *observe/perceive*, (3) *relativization*, (4) *openness/non-avoidance*, (5) *act aware*, and (6) *acceptance/self-compassion*.

These differing conceptualizations of mindfulness highlight the problematic confusion of mindfulness practice (as a method to become mindful) and dispositional or trait mindfulness (the phenomenon, Brown et al. 2007). For our own mindfulness interventions and in contrast to other conceptualizations, we differentiate mindfulness practice from dispositional mindfulness. For the concept of mindfulness practice, we mostly follow the proposal by Shapiro and colleagues (2006) because it seems to be a parsimonious model. Almost all of the other models' facets can be integrated into Shapiro and colleagues' conceptualization. Further, *bare attention* and *nonjudgmental attitude* have shown a reasonable impact on psychological functioning in empirical studies (Coffey et al. 2010; Carmody et al. 2009). Thus, our mindfulness practice concept consists of the following interwoven facets: (1) an *intention* to practice, which could include self-regulation, self-exploration, self-liberation, insight, and wisdom (see also Dorjee 2010), (2) *bare attention* to internal or external stimuli with the possibility of sustained attention, shift, and inhibition, and (3) an *attitude* of

nonjudgmental, acceptance, openness, self-respect, and non-reactivity. Although there are signs that *intention* to practice is not a relevant impact factor (Coffey et al. 2010; Carmody et al. 2009), we decided to keep it in our conceptualization because intention to practice can constitute an important motivational variable in the context of elite sports. Regarding dispositional mindfulness, we suggest using Bergomi and colleagues' (in press) concept because it is based on eight validated mindfulness questionnaires and shows good reliability and validity. Further, the authors emphasized while constructing the instrument that the measure is equally applicable to experienced meditation practitioners and meditation novices. Therefore, it should be applicable to athletes. To differentiate between mindfulness practice and dispositional mindfulness, we refer to facets of mindfulness when we talk about mindfulness practice and to components of mindfulness when we talk about trait mindfulness.

Mechanisms of Mindfulness

Mindfulness is often described as a key aspect of the so-called third wave of behavior therapy (Hayes 2004). These interventions emphasize changing the function, not the form of behavior, emotion, cognition, bodily sensations, and external stimuli. They aim to change the relationship to thoughts and emotions, not the content of thoughts and emotions. This differentiation is important to bear in mind because it has an essential influence on possible impact mechanisms. Additionally, for examining the effectiveness of mindfulness-based interventions as well as their impact mechanism, considering the techniques used to foster dispositional mindfulness is important. MBSR (Kabat-Zinn 1982) and Mindfulness-Based Cognitive Therapy (MBCT; Segal et al. 2002), for example, emphasize regular mindfulness meditation practice whereas acceptance and commitment therapy (ACT; Hayes et al. 1999) and dialectical behavior therapy (DBT; Linehan 1993) do not.

There is evidence that formal mindfulness practice leads to more dispositional mindfulness (Carmody et al. 2009). The degree of dispositional mindfulness is also influenced by informal practice (doing routine activities mindfully, Kabat-Zinn 1990) and psychotherapy (Martin 1997) as well as individual genetic (Way et al. 2006) and developmental (Greenough and Black 1992) differences. In addition, knowledge about mindfulness (through education in psychology) could influence the degree of dispositional mindfulness. However, which of these factors and which combination of these factors contribute to what extent to changes in psychological functioning and with athletes to changes in performance is unclear.

There is evidence that increased dispositional mindfulness mediates improvement in psychological functioning (see Baer 2009 for a review) and that different facets of dispositional mindfulness make different contributions to psychological functioning (Cash and Whittingham 2010; Baer et al. 2008; Baer et al. 2006). It is hypothesized that improved attention facilitates the recognition of internal associative processes (Carmody 2009). This recognition leads to the development of reperceiving (Shapiro et al. 2006). Reperceiving is closely related to the concepts of decentering (Safran and Segal 1990), deautomatization (Deikman 1982), detachment (Bohart 1983), and metacognitive awareness (Teasdale et al. 2002).

These terms describe a change in perception. It is no longer the content (of, e.g., a thought) that is perceived, but the content (of this thought) as an event in/of the mind (Shapiro et al. 2006). This perception is accompanied by the insight that experience consists of components of thoughts, emotions, and bodily sensations associated with each other. This change in perception and the resulting insight lead in turn to various psychological outcomes. According to Shapiro and colleagues (2006), reperceiving is a meta-mechanism for the mechanisms of action flexibility, values clarification, self-regulation, and exposure. Carmody et al. (2009) showed that change in flexibility and change in values were significant predictors (mediators) of changes in perceived stress and psychological symptoms. However, the significant influence of reperceiving as a meta-mechanism has been only partially confirmed.

Coffey et al. (2010) tested the mediating roles of clarity about one's internal life, the ability to manage negative emotions, non-attachment, and rumination in the relationship between mindfulness and psychological distress and flourishing mental health. Ruminating is a form of self-focus in which thoughts cycle around a common topic. Results confirmed the importance of these mediators in the relationship between the mindfulness facets of present-centered attention and the acceptance of experience and mental health. Interestingly, the attitudinal, acceptance-based facet of mindfulness (practice) mattered more for the measured psychological functioning than the attention facet. Acceptance is another considered mechanism of action for mindfulness (Hayes et al. 1999). Acceptance stands in contrast to avoidance and control and can lead to a calmness independent of external circumstances.

These findings suggest that mechanisms by which mindfulness might beneficially impact psychological adjustment are (1) *bare attention*, (2) *experiential acceptance*, (3) *values clarification*, (4) *self-regulation/negative emotion regulation*, (5) *clarity* about one's internal life, (6) *exposure*, (7) *flexibility*, (8) *non-attachment*, and (9) *less rumination*. Considering these possible mechanisms of action for mindfulness practice and taking into account Birrer and Morgan's (2010) model, we assumed the following mechanisms of action of mindfulness practice for athletes (Fig. 2):

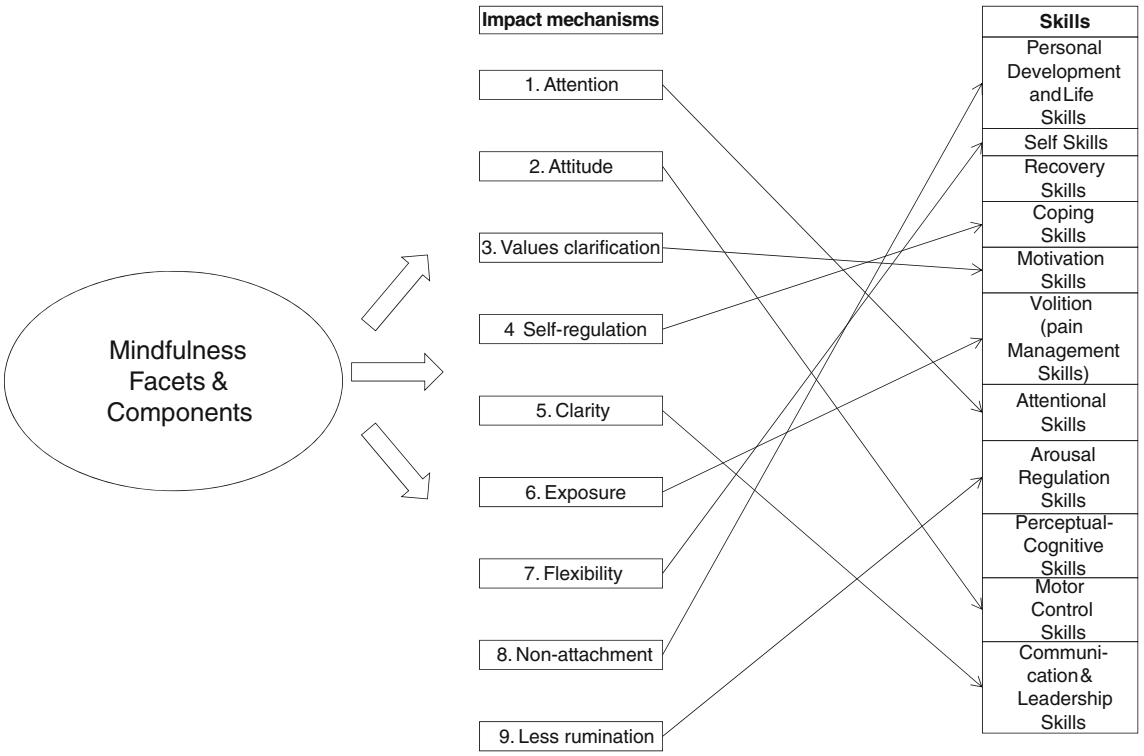

Fig. 2 Potential impact mechanisms of mindfulness facets and components on psychological skills. *Arrows* imply the influence of mechanisms on skills. Only one possible relationship between a mechanism and a skill is shown because of clarity reasons

- *Bare attention* facet of mindfulness practice: Mindfulness practice (the bare attention facet) improves *attentional* and *perceptual-cognitive skills* directly (Chambers et al. 2008; Chiesa et al. 2011; Ortner et al. 2007). Therefore, athletes are possibly less distracted, better able to control their attention and place it on goal-relevant aspects, and improve their action orientation. When attention is no longer employed with irrelevant content, it is free for other aspects of the situation, which might lead to a solution of a problem and a better outcome (Carmody 2009).
- *Attitude* facet of mindfulness practice (acceptance, non-judgmental, openness, self-respect, and non-reactivity): Mindfulness practice increases experiential acceptance (Hayes et al. 1999). As a result, athletes accept a performance discrepancy (unexpected poor performance and unexpected good performance), and reinvestment processes are not be triggered. The tendency to control automatized movements with declarative knowledge is reduced, and athletes could therefore enhance their performance of well-learned *motor skills* because automatic processes are not interrupted. Additionally, the occurrence of ironic mental processes would decrease, which again should favor athletic performance.
- *Values clarification*: Mindfulness practice leads to a clarification of values (Shapiro et al. 2006). Athletes could identify conflicts between their personal values and goals and thus increase their self-concordance (Koestner et al. 2002) and the degree of their self-determined behavior, which would have a positive effect on their need-satisfaction (Deci and Ryan 1985). Consequently, *motivational skills*, *personal*, and *developmental* as well as *self skills* would profit from a clarification of values.
- *Self-regulation/negative emotion regulation*: Dispositional mindfulness as a result of formal and informal mindfulness practice enhances self-regulation (Carmody et al. 2009; Coffey et al. 2010; Shapiro et al. 2006). Therefore, athletes would be better able to deal with anger, fear, and other negative emotions. *Arousal regulation*, *coping*, *communication*, and *leadership*, as well as *self skills*, should profit from an enhanced self-regulation.
- *Clarity* about one's internal life: Mindfulness leads to better clarity about one's internal feelings and one's ability to control behavior in the presence of negative affect (Coffey et al. 2010). Better clarity would have a positive effect on *personal development* and *life*, *self*, *recovery*, and *coping* as well as *communication* and *leadership skills*. Thus, there would be fewer overtrained athletes and drop-outs.
- *Exposure*: Mindfulness practice leads to more exposure (Shapiro et al. 2006), in particular the willingness to remain in contact with an unpleasant experience. Therefore, athletes could be more willing to endure negative

emotions and aversive states instead of avoiding them. Thus, the athletes could confront more difficult situations in competition, tend to extend their threshold of pain, and be willing to face aversive training situations. Enhanced *volitional*, *pain management*, and *coping skills* are the likely consequence.

- Cognitive, emotional, and behavioral *flexibility*: Adaptation and flexibility in responding to the environment as a result of dispositional mindfulness (Carmody et al. 2009) promote the consolidation of *personal development* and *self* as well as *communication* and *leadership skills*.
- *Non-attachment*: The belief that one's own happiness is independent of obtaining positive outcomes (non-attachment) is a consequence of mindfulness (practice) (Coffey et al. 2010). Presumably, non-attachment reduces ironic mental processes and reinvestment. Thus, non-attachment has a positive effect on *personal development*, *self*, *recovery*, *coping*, and *motor control* as well as *communication* and *leadership skills*.
- *Less rumination*: Mindfulness reduces rumination (Coffey et al. 2010) or at least the uncontrollability of rumination (Raes and Williams 2010). Less ruminating thinking influences several psychological skills, most likely *personal development* and *life*, *self*, *recovery*, *coping*, *arousal regulation*, *attentional*, and *motor control skills*.

The Goal Paradox: Can Mindfulness Be Applied in an Elite Sports Environment?

At this point, it seems appropriate to address the issue of the apparent inconsistency of the fundamental no goal and acceptance attitude of traditional mindfulness practice and the radical goal orientation of elite sports. This issue stems from the difficulty of Western society adopting a concept developed over centuries within an Eastern cultural background. Elite sports signify the pinnacle of meritocracy of modern Western society. In an environment where coming fourth is often regarded as a failure, athletes are extremely outcome oriented. This radical goal orientation stands in contrast to the acceptance and no goal attitude of mindfulness. Stemming from Buddhist tradition, the practice of mindfulness is based on an Eastern philosophical belief that the source of suffering is an uncontrolled mind guided by anger, attachment, and ignorance (Dorjee 2010). The goal of mindfulness meditation is therefore often the liberation of one's desire and will. This (ostensibly) contradicts an athlete's goal to win a competition. Obviously, there is a paradox we cannot easily solve. Otherwise, inherent aspects of sports are consistent with mindfulness (philosophy). For instance, successful athletes have realized that the temptation of focusing on winning can inhibit their current performance. Four-time Olympic, six-time World, and 21-time European Champion Alexander Popow (freestyle swimming) is a very good example of keeping one's attention on the moment at hand. Before winning his sixth World title in 2003, he stated seemingly succinct: "Who thinks of winning loses." He realized that thoughts on winning would distract him from the task at hand and inhibit the delivery of automated processes. Hence, successful athletes already seem to use attitudes conjoint with mindfulness philosophy, namely, focusing on the present moment, accepting an unpleasant experience such as physical pain, and practicing consistently. However, integrating mindfulness-based interventions in an elite sports setting remains challenging.

To tackle the general problem of integrating mindfulness in therapeutic concepts of Western society, Berking and Znoj (2006) suggested distinguishing different facets of mindfulness and training them separately. We addressed this aspect earlier by making a thorough distinction between the facets of mindfulness practice and the components of dispositional mindfulness and their possible impact mechanisms on the specific demands of psychological functioning of elite athletes. Regarding the intention to train facet of mindfulness, most athletes certainly aim to enhance their self-regulation. The key challenge is to unite the attitude facet with the attitudes shaped by Western sociocultural-related forces and the forces stemming from every different sports culture (for example, the sports culture of professional soccer differs in many aspects from the culture of rhythmic gymnastics). With this in mind, mindfulness is far from being seen as a psychological skill or a quick fix. On the contrary, the training and practice aspect inherent in mindfulness meditation is very similar to the understanding of training in sports. Performance is mostly seen as an outcome of a years-long training process. Similarly, enhancing self-regulation can be easily seen as the cause of a process demanding hundreds of hours of continual practice with the right attitude (non-judgmental, acceptance, openness, self-respect, and non-reactivity). These similarities can be used in applying mindfulness-based interventions to a sports setting.

This leads to another point Berking and Znoj (2006) suggested: how to beneficially integrate mindfulness in the Western context. The introduction together with the reasoning for mindfulness interventions must be separated from the traditional Buddhist culture and adapted to the predominant values and belief system of Western culture, and even more specifically to the different sports cultures. The acceptance attitude of mindfulness practice, for example, might be easily misinterpreted in a sports setting and can lead to unintended outcomes. For instance, a player might be tempted to accept the result at the half-time of a game as an

unmistakable fact and therefore accept the thought that his or her opponent is stronger than his or her own team, and thus give up before the end of the game. Hence, an introduction to the mindfulness attitude might require a thorough understanding of mindfulness aspects as well as the sports culture. The athlete has to understand that acceptance does not mean the approval of the present moment condition but the non-judging awareness of the present circumstances or the reaction to it in the form of thoughts and emotions. Consistent with the third wave of behavior therapy (Hayes 2004), thoughts are seen as what they are, namely, thoughts and not facts. Similarly, emotions are emotions and nothing else. Modification of dysfunctional thoughts is not targeted, but the insight that thoughts are just processes of our brain and the refocus on other psychological functions, for instance, the perception of task relevant aspects are normal. Similarly, emotions, bodily sensations, and external stimuli are not the aim of change, but the relationship to them. Therefore, using mindfulness techniques will help athletes regain a state of mind where goal-oriented behavior and automatic goal-focused processes are facilitated.

Thus, the sole use of either mindfulness training or psychological skills training will likely be ineffective in tackling athletes' issues as long as the training is not integrated into one compatible concept. Therefore, we agree with Berking and Znoj (2006) that mindfulness-based techniques might have to be taught with other techniques, which enables a person to proactively solve a problem.

Current State of Knowledge about the Effectiveness of Mindfulness-Based Interventions in Sports

Kabat-Zinn et al. (1985) provided training in mindfulness meditation to collegiate and Olympic rowers with specific applications of mindfulness to rowing. The researchers reported that collegiate rowers exceeded the coach's expectations based on the athletes' level of experience and physical abilities. Furthermore, several rowers who medaled at the Olympics reported that mindfulness training helped them perform at their full potential. After this promising start, mindfulness-based interventions in sports more or less disappeared from the sport psychology landscape for almost two decades. Recently, two sport-specific mindfulness-based intervention programs have been developed: Mindfulness–Acceptance–Commitment Approach (MAC; Gardner and Moore 2007) and Mindful Sports Performance Enhancement (MSPE; Kaufman et al. 2009). To our knowledge, eight empirical studies have been conducted in English that investigate mindfulness in sports or mindfulness-based interventions with athletes. There are two correlational studies (Gooding and Gardner 2009; Kee and Wang 2008) and a single case study (Schwanhausser 2009). The remaining five are intervention studies. Three examine the MSPE program (De Petrillo et al. 2009; Kaufman et al. 2009; Thompson et al. 2011). The other two explore other mindfulness-based interventions (Aherne et al. 2011; Bernier et al. 2009). The number of subjects in the intervention studies is at most 32. If there is a control group, it is a passive waiting list control group. In sum, there is empirical evidence that dispositional mindfulness is a performance-relevant trait in sports and that mindfulness-based interventions may be helpful for athletes. The results so far suggest that dispositional mindfulness is related to more flow, less fear, and fewer task-irrelevant thoughts. Mindfulness-based interventions seem to increase dispositional mindfulness. For a thorough assessment, however, more high-quality studies are needed. They should use randomized control group designs with active control groups or multiple baseline designs and measure performance as the dependent variable. A systematic study of the mechanisms of action of mindfulness-based interventions in sports has yet to be conducted. The effects found so far are relatively small and/or not significant. In competitive sports, however, even small effects can be important. Detecting small effects takes a lot of statistical power and therefore a large number of subjects. This is likely to prove to be difficult in the context of competitive sports. Ways to deal with this problem are meta-analyses or correlational studies with large numbers of subjects.

Conclusions

The aim of the present paper was to present theoretical considerations on how mindfulness-based interventions can be used to help elite athletes successfully meet the demands of their sport. The focus was on the distinction between mindfulness practice and dispositional mindfulness as well as possible mechanisms of impact. Overall, the use of mindfulness-based interventions in sports seems to be a promising approach. By explaining what and how performance-related skills can be improved with mindfulness practice, the theoretical considerations show that it makes sense to scientifically study this approach let alone its value as a practical intervention concept. Mindfulness seems to be a holistic intervention fostering the development of several personal, sport, and performance-relevant psychological skills.

However, to effectively apply mindfulness-based interventions in sports, we suggest thoroughly differentiating the mindfulness practice facets from the mindfulness components of dispositional mindfulness and training and measuring them separately (although we see them as more or less interwoven but distinguishable constructs). As a first step, examining the relationship of dispositional mindfulness and performance-relevant variables and preliminarily studying the hypothesized impact mechanism in cross-sectional studies

with many elite athletes seems worthwhile. As a second step, the influence of mindfulness practice on dispositional mindfulness and performance-relevant variables might be investigated in intervention studies.

Because of the limited empirical data and despite the statistical challenges, many questions need to be addressed in both steps: (1) Do mindfulness-based interventions have a performance-relevant effect on athletes? This question should be investigated with randomized control group studies, active control groups, or multiple baseline designs and standardized intervention manuals. The intervention is effective if mindfulness practice is associated with an improvement in performance-related skills and a reduction of inhibitors of high performance or at its best improving performance. These relationships should be mediated by changes in dispositional mindfulness. In additional steps, the following questions should be examined: (2) Can the postulated mechanisms of action of mindfulness-based interventions for athletes be confirmed? (3) How much (dose) and what kind of mindfulness practice (formal, informal, psycho-education) is necessary to achieve the expected changes in performance-related skills (response)? (4) Do different components of dispositional mindfulness have different influences on performance-related skills? (5) What kind of mindfulness practice influences which components of dispositional mindfulness? (6) What facets of mindfulness practice have what influence on performance-related skills and dispositional mindfulness? (7) How can mindfulness-based interventions and traditional PST be combined? Further, whether mindfulness-based interventions in some cases could result in performance decline, because athletes might remain self-focused too long, is not clear.

Finally, a briefly outline of how mindfulness techniques might be translated into the sports setting seems appropriate. Mindfulness practice can be taught in many ways. Formal mindfulness breathing exercises might be introduced in a non-sports setting. To explain the mindfulness philosophy, using the athlete's own examples and demonstrating a non-judging and accepting attitude in his or her specific situations is important. Additionally, mindfulness exercises can be easily transferred into a training program or training session as Kabat-Zinn and colleagues (1985) demonstrated when they delivered sport-specific mindfulness techniques to rowers. Rowers can train mindfulness exercises directly in their boat when they focus on the breath or letting go of thoughts of pain and discomfort. As another example, a body scan exercise can easily be administered during the cool-down phase at the end of a training session. At first glance, mindfulness seems incompatible with an elite sports setting. However, with the appropriate openness as well as sport-specific expertise, mindfulness techniques can be integrated in a sports setting in many ways.

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Anhang D

Mindfulness
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ORIGINAL PAPER

Mindfulness Promotes the Ability to Deliver Performance in Highly Demanding Situations

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Abstract Trait mindfulness helps people handle distress and improves their satisfaction with life. The aim of the present paper is to examine whether trait mindfulness also promotes positive functioning (i.e., performance) in highly demanding situations, such as in elite sports. Mindfulness has been shown to improve athletes' ability to perform well, i.e., to increase their performance-delivery. However, researchers are still speculating about the underlying mechanism. The present research examines whether trait mindfulness enhances the ability of elite athletes to trigger performance in demanding situations by generally reducing competition anxiety and diminishing its negative impact when it occurs. Participants were 133 elite athletes from 23 different sports. They completed measures of trait mindfulness, competition anxiety, and performance-delivery. Mediation, moderation, and moderated-mediation effects of mindfulness and competition anxiety on performance-delivery were tested. Our findings indicate that trait mindfulness is related to fewer performance worries and prevents the remaining worries from influencing athletes' behavior, thereby helping them to perform better. Implications and directions for further research are discussed. Apart from benefits for psychological health, instructing people to become more mindful might be a promising approach to help them optimize their performance in demanding situations.

Keywords Performance enhancement · Peak performance · Competition anxiety · Elite sport · Moderated mediation

Introduction

Mindfulness as a multidimensional trait means the general tendency to attend to present-moment experiences in everyday life in an accepting, nonjudgmental, and nonelaborating manner (Kabat-Zinn 2003). Empirical studies have shown that mindfulness can be trained and that it positively affects significant functions and processes in our lives (Grossman et al. 2004; Hofmann et al. 2010). However, do these effects also promote positive functioning in highly demanding situations? And if yes, how?

Elite athletes often experience situations that place high demands on their coordinative, physical, and psychological skills, and whether these skills can be performed or not determines success or failure (Birrer and Morgan 2010). Elite sports can be considered an extreme example of the kinds of situations that place high demands on peoples' behavior. There is preliminary evidence that trait mindfulness promotes the delivery of athletic performance (Gardner and Moore 2012; Gooding and Gardner 2009; Thompson et al. 2011).

Trait mindfulness may improve performance-delivery in demanding situations by decreasing competition anxiety. Trait anxiety includes a somatic and cognitive component. Cognitive anxiety refers to the general tendency to worry about oneself, the situation at hand, and potential negative consequences, whereas somatic anxiety encompasses the experience of autonomic arousal and nervousness (Morris et al. 1981). While some amounts of anxiety might even positively

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affect an athlete's performance (e.g., via enhanced effort and alertness, Hardy 1990), it generally impairs performance when pressure is high (e.g., via the loss of concentration or too much muscular tension, Hill et al. 2010; Martens et al. 1990). Athletes with high levels of trait anxiety are more likely to show decrements in performance in situations that are subjectively regarded as important by them, despite their will and capability to perform better (i.e., choking under pressure, Baumeister and Showers 1986). Competition anxiety was found to be negatively associated with trait mindfulness in elite and subelite athletes (Thienot et al. 2014).

Research shows that after mindfulness interventions, participants showed less anxiety-associated amygdala activity (Goldin and Gross 2010) and reported more trait mindfulness, which, in turn, predicted decrements in trait anxiety (Anderson et al. 2007; Shapiro et al. 2007). Possibly, by attending to negative experiences in an accepting manner, people become desensitized to unpleasant emotions that they would otherwise avoid, which makes these emotions less distressing (Keng et al. 2011). Mindfulness-based interventions for athletes (Gardner and Moore 2007) focus on fostering the acceptance rather than the change of negative emotions (like anxiety), because trying to change emotions and thoughts binds attentional resources needed for the current athletic task at hand (Gardner and Moore 2004). Thus, the reduction of anxiety after such interventions might be regarded as a side effect. In sum, the current research suggests that trait mindfulness may improve performance-delivery in demanding situations by decreasing competition anxiety.

Other than the direct influence of mindfulness on competition anxiety, mindfulness might also have a moderating influence on the relationship between competition anxiety and performance-delivery in demanding situations, i.e., the level of mindfulness may ease the adverse impact of a given level of competition anxiety on performance-delivery in demanding situations. This concurs with research outside the field of sports that shows that trait mindfulness promotes more adaptive responses to stressful situations (Arch and Craske 2010), decreases the ability of unpleasant emotional experiences to elicit unhealthy behavior (Adams et al. 2015), and is associated with neural mechanisms that promote the observation of distress without acting upon it (Creswell et al. 2007). As a result, people are able to maintain adaptive behavior, for example, while being anxious.

Research that investigates how mindfulness may affect behavior indicates that trait mindfulness both inversely predicts negative emotions (i.e., perceived psychosocial stress) and moderates the relationship between negative emotions and *maladaptive* behavior (i.e., alcohol abuse, Adams et al. 2015). In the present research, we follow this moderated-mediation model to examine whether trait mindfulness is also associated with *performance-promoting* behavior in demanding situations. We tested the following three hypotheses: (1) Trait mindfulness is positively associated with the ability to deliver performance in demanding situations, (2) trait mindfulness is negatively associated with competition anxiety, which, in turn, is negatively associated with performance-delivery (mediation), and (3) trait mindfulness buffers the detrimental effects of anxiety on performance-delivery in demanding situations (moderation).

Method

Participants

The study sample consists of 133 athletes from 23 different sports (45.9 % male, $M_{age} = 23.68$, $SD_{age} = 6.12$, age range 17–53, 30.8 % team sports). Of these athletes, 30.8 % rated their current performance level as worldwide international top, 18.0 % as international top in Europe, 48.9 % as national top, and 2.3 % as lower than national top. Of the respondents, 94.7 % reported that they had represented their country in their respective sport. The mean hours of training per week were 14.63 (SD = 6.13). The nine most common sports in the sample were cycling (13.5 %), floorball (9.8 %), orienteering (9.8 %), curling (9.8 %), athletics (9 %), judo (7.5 %), horse riding (5.3 %), handball (5.3 %), and shooting (4.5 %). Mean substitution was used to replace four missing data points.

Procedure

The research was conducted in accordance with APA ethical guidelines. All participants provided informed consent, and confidentiality and anonymity were assured. Twenty-five national sport associations were informed about the study in detail and asked to forward a link of an online survey to all members of their national teams. Of 838 athletes who received the link, 262 agreed to support our research by participating in one of two online surveys, to which they were randomly assigned. Athletes were told that they can take part in a sport psychological study that investigates the relation between different psychological variables. Participants were offered the possibility to receive a feedback of parts of their individual study results.

Measures

We measured trait mindfulness using the total scale of the 37-item Comprehensive Inventory of Mindfulness Experiences (CHIME, Bergomi et al. 2013, 2014). The participants rated how often they engaged in various behaviors or had certain experiences in the last 2 weeks on a 6-point Likert scale, ranging from 1 (*almost never*) to 6 (*almost always*). Sample items are "It is easy for me, to focus on what I am doing," and "When I have unpleasant thoughts and feelings, I can just

notice them, without immediately reacting to them." Bergomi et al. (2013, 2014) developed the CHIME, taking into account all aspects of mindfulness that are contained in all eight previously validated mindfulness questionnaires, and provided evidence for its reliability and validity. These aspects include the general tendency to focus attention on the current moment; not to react automatically to experiences; to face experience in an open way, rather than to distract oneself from it; and to respond to experiences in an accepting and nonjudgmental way. The Cronbach alpha in the study sample was 0.78.

We measured cognitive and somatic competition anxiety using two 4-item subscales of the Competition Anxiety Inventory Trait (CAI-T, Brand et al. 2009). The participants were asked to indicate their level of agreement with statements about different behaviors or specific experiences before competitions in general on a 4-point Likert scale, ranging from 1 (*not at all*) to 4 (*strongly*). Sample items for the two subscales are "Before competitions, I have self-doubts" (*cognitive competition anxiety*) and "Before competitions I feel nervous" (*somatic competition anxiety*). Brand et al. (2009) developed the CAI-T along the lines of the Sport Anxiety Scale (Smith et al. 1990) and provided psychometric support for the measure and its use in sports. The Cronbach alphas in the study sample were 0.84 (cognitive competition anxiety) and 0.72 (somatic competition anxiety).

We assessed the ability to deliver performance in demanding situations using a self-generated three-item measure. The participants were asked to rate how often they engaged in specific types of behaviors in important situations in games or competitions in the last 3 months on a 5-point Likert scale, ranging from 1 (*never*) to 5 (*always*). The wording of the three items was as follows: "In the last three months, I could perform when it really mattered," "In the last three months, I failed in crucial situations (inversed)," and "In the last three months, I couldn't handle the pressure during important moments (inversed)." The reliability analysis showed a Cronbach alpha of 0.67.

Data Analysis

Bivariate correlations between all the study variables were tested using Pearson's correlation analysis. Similar to other studies that tested moderated-mediation models (e.g., Berndt et al. 2013), further analysis progressed in three steps (for details, see the "Results" section). First, we conducted *parallel multiple mediation analysis* to assess the effect of trait mindfulness on performance-delivery in demanding situations, both directly and indirectly, through cognitive and somatic competition anxiety, using path-analytic approaches (Preacher and Hayes 2008). Then, we estimated the extent to which trait mindfulness moderated the effect of cognitive and somatic competition anxiety on performance-delivery using *moderated ordinary least-squares (OLS) regression analysis* (Hayes and Matthes 2009). Finally, we combined the mediation and moderation results and examined the conditional indirect effect of trait mindfulness on performance-delivery in demanding situations through competition anxiety as a function of trait mindfulness, using the *moderated-mediation approach* described in Preacher et al. (2007). All analyses were conducted using SPSS version 22 software for Windows.

Results

The means, standard deviations, and Pearson correlations between the scales are presented in Table 1.

Parallel Multiple Mediation

Parallel multiple mediator analysis using OLS path analysis indicated that trait mindfulness was indirectly associated with performance-delivery in demanding situations through its effect on cognitive competition anxiety. As suggested by Hayes (2013), all the regression coefficients are reported in unstandardized form. As can be seen in Table 2, trait mindfulness was associated with performance-delivery ($c = 0.52$, $p < 0.01$, model 1, Table 2). In addition, increased reports of mindfulness were associated with reduced cognitive ($a_1 = -0.81$, $p < 0.01$) and somatic ($a_2 = -0.46$, $p < 0.01$) anxiety before a competition (models 2 and 3, Table 2). Although cognitive competition anxiety was associated with decreased self-reported ability to deliver performance in situations with high demands ($b_1 = -0.34$, $p < 0.01$), somatic competition anxiety was not ($b_2 = -0.01$, $p = 0.91$, model 4, Table 2). Bias-corrected bootstrap confidence intervals (CIs) based on 5000 bootstrap samples revealed a significant positive indirect effect of trait mindfulness on performance-delivery in demanding situations through cognitive competition anxiety ($a_1 b_1 = 0.27$, 95 % CI [0.13, 0.47]) but not through somatic competition anxiety ($a_2 b_2 = 0.00$, 95 % CI [−0.09, 0.10]). The effect of trait mindfulness on performance-delivery, independent of its effect on cognitive and somatic competition anxiety, was just under the conventional statistical limit of significance ($c' = 0.25$, $p = 0.08$).

Moderation

To test the ability of trait mindfulness to moderate the effect of competition anxiety on performance-delivery, we estimated two OLS regression models predicting the ability to deliver performance in demanding situations from trait mindfulness,

Table 1 Descriptive statistics and correlations (Pearson) between variables

	Mindfulness	Cog. comp. anxiety	Som. comp. anxiety	Performance-delivery
M	3.90	2.38	2.33	3.84
SD	0.38	0.68	0.60	0.61
Mindfulness	–			
Cog. comp. anxiety	−0.45**	–		
Som. comp. anxiety	−0.29**	0.46**	–	
Performance-delivery	0.33**	−0.45**	−0.23**	–

Cog. comp. anxiety cognitive competition anxiety, *Som. comp. anxiety* somatic competition anxiety

**$p < 0.01$

cognitive competition anxiety, and their mean-centered interaction term (model 5, Table 2) and from trait mindfulness, somatic competition anxiety, and their mean-centered interaction term (model 6, Table 2), respectively. This analysis revealed that the effect of cognitive competition anxiety on the ability to deliver performance in demanding situations was moderated by trait mindfulness. In contrast, performance-delivery was not influenced by somatic competition anxiety or its interaction with trait mindfulness (see Table 2).

To better understand the nature of the interaction between trait mindfulness and cognitive competition anxiety, we estimated conditional effects (simple slopes) of cognitive competition anxiety on performance-delivery using the "pick-a-point" approach (Hayes and Matthes 2009), with the sample mean and ±1 SD from the mean representing "moderate," "high," and "low" trait mindfulness. Cognitive competition anxiety was significantly and negatively related to the ability to deliver performance in situations with high demands at low, moderate, and high trait mindfulness, with the effect approaching zero as trait mindfulness increased. The conditional effects were −0.48, −0.35, and −0.22 at low, moderate, and high values of trait mindfulness, respectively (all $ps < 0.05$; see Fig. 1).

Moderated Mediation

As we found support for both the mediation and moderation hypotheses, we next examined a moderated-mediation model. Combining the methods described above, the moderated-mediation model (i.e., conditional indirect effect model) examined whether the indirect effect of trait mindfulness on performance-delivery in demanding situations through cognitive and somatic competition anxiety was conditional on the athlete's level of trait mindfulness (see model 1 in Preacher et al. 2007). We estimated an OLS regression model predicting performance-delivery from trait mindfulness, cognitive and somatic competition anxiety, the mean-centered products of trait mindfulness, and cognitive competition anxiety, as well as trait mindfulness and somatic competition anxiety. The results of this estimation are presented in Table 2 (model 7) and Fig. 2. Despite the absence of an indirect effect of trait mindfulness on performance-delivery through somatic anxiety and the absence of a significant

Table 2 OLS regression model coefficients (standard errors in parentheses; $N = 133$)

Outcome →	Performance-delivery Model 1	Cog. comp. anxiety Model 2	Som. comp. anxiety Model 3	Performance-delivery			
				Model 4	Model 5	Model 6	Model 7
Mindfulness	0.52** (0.13)	−0.81** (0.14)	−0.46** (0.13)	0.25 (0.14)	0.23 (0.14)	0.46** (0.14)	0.25 (0.14)
Cog. comp. anxiety				−0.34** (0.08)	−0.35** (0.08)		−0.35** (0.08)
Som. comp. anxiety				−0.01 (0.09)		−0.15 (0.09)	0.02 (0.09)
Mind. × CA					0.34* (0.16)		0.47* (0.19)
Mind. × SA						0.02 (0.21)	−0.32 (0.23)
Constant	1.80** (0.51)	5.53** (0.54)	4.14** (0.52)	3.71** (0.67)	3.88** (0.05)	3.84** (0.05)	3.87** (0.05)
R^2	0.11**	0.21**	0.09**	0.23**	0.25**	0.13**	0.26**

In models with interactions, the variables were mean centered prior to the analysis. All the regression coefficients are in unstandardized form

Cog. comp. anxiety cognitive competition anxiety, *Som. comp. anxiety* somatic competition anxiety, *Mind.* mindfulness, *CA* cognitive competition anxiety, *SA* somatic competition anxiety

*$p < 0.05$; **$p < 0.01$

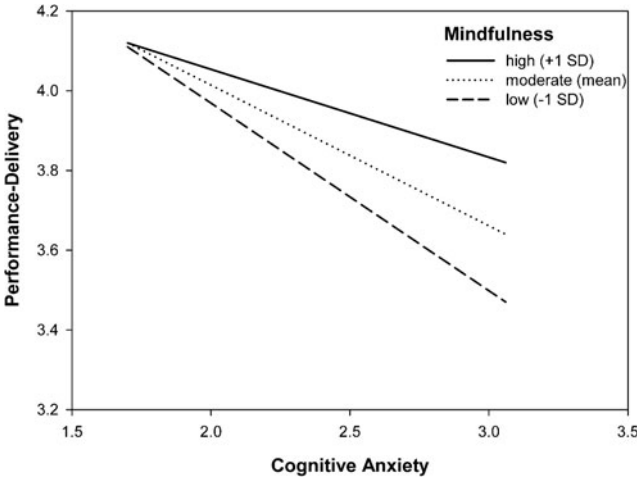

Fig. 1 Moderation of the effect of cognitive competition anxiety on performance-delivery in demanding situations by trait mindfulness

trait mindfulness × somatic anxiety interaction term, we decided to leave somatic anxiety in the model, as we wanted to examine the complete moderated-mediation model including all the variables (the model without somatic anxiety revealed the same results). To test whether these indirect effects differed from zero at specific values of the moderator (again the sample mean and ±1 SD from the mean), we conducted and tested conditional indirect effects using 5000 bootstrap estimates for the construction of 95 % bias-corrected CIs for the conditional indirect effects.

The indirect effect of trait mindfulness on the ability to deliver performance in demanding situations through cognitive competition anxiety was positive for athletes with low (0.43, 95 % CI [0.21, 0.72]) and moderate (0.28, 95 % CI [0.14, 0.49]) levels of mindfulness. However, this indirect effect was no different from zero for athletes with high levels of mindfulness (0.14, 95 % CI [−0.02, 0.33]). The indirect

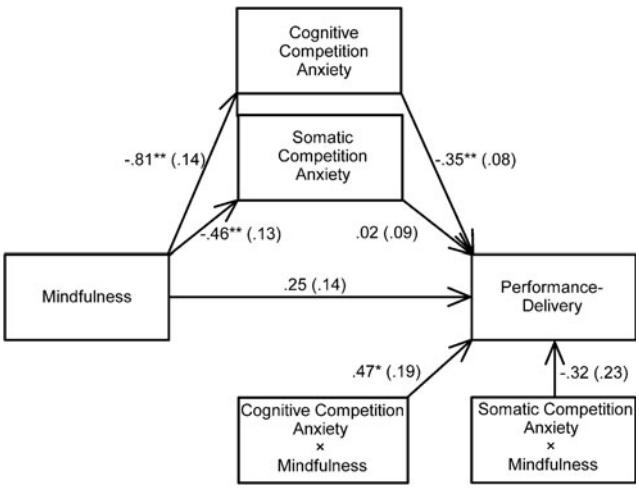

Fig. 2 Results of regression analyses for moderated mediation (unstandardized regression coefficients, standard errors in *brackets*). *One asterisk* $p < 0.05$; *Two asterisks* $p < 0.01$

effect of trait mindfulness on performance-delivery in demanding situations through somatic anxiety was not different from zero, regardless of the level of trait mindfulness (−0.06, 95 % CI [−0.27, 0.07]; −0.01, 95 % CI [−0.12, 0.09]; and −0.05, 95 % CI [−0.04, 0.22] at low, moderate, and high values of trait mindfulness, respectively.

Discussion

Our findings partly confirmed the hypotheses that the association between trait mindfulness and a better ability to deliver performance in demanding situations was mediated by anxiety. Trait mindfulness was associated with subjectively perceived athletic performance by negatively predicting cognitive but not somatic anxiety. Trait mindfulness was negatively correlated with cognitive and somatic anxiety. This finding is in line with previous research, which shows that trait mindfulness is related to a low frequency of worrisome thoughts (Frewen et al. 2008) and that mindfulness practice leads to a reduction of worries and physiological arousal (Delgado et al. 2010). While cognitive competition anxiety was negatively associated with performance-delivery in demanding situations, somatic competition anxiety was not. This suggests that the cognitive aspects of anxiety are closely associated with performance decrements but not mere felt arousal. Somatic anxiety might impair athletic performance in demanding situations only when experienced as debilitative (Swain and Jones 1996), in combination with high cognitive anxiety (Hardy 1990), or in athletes with low self-confidence (Hardy et al. 2004).

Our results show that not all athletes with high levels of cognitive competition anxiety reported impaired ability to deliver performance in demanding situations. Therefore, testing potential moderators seemed worthwhile. As expected, trait mindfulness buffered the negative effect of cognitive competition anxiety on performance-delivery (i.e., athletes with a high level of trait mindfulness reported fewer performance decrements due to cognitive anxiety). These findings suggest that trait mindfulness has a protective effect: People can cognitively be very anxious but still be able to perform. Two different mechanisms may lead to this positive outcome. First, studies have shown that trait mindfulness helps people to let go of worry-related thoughts (Frewen et al. 2008) and that mindfulness practice prevents the deterioration of working memory capacity during periods of high stress (Jha et al. 2010). Therefore, athletes are less likely to overwhelm their working memory system (i.e., with worries), which would increase the risk of a bad performance due to distraction (Eysenck and Calvo 1992). The second explanation is provided by findings showing that trait mindfulness promotes in-the-moment and nonjudgmental activity, resulting in a capacity to automatically engage in well-learned motor skills (Kaufman

et al. 2009). Therefore, athletes are less likely to explicitly monitor skill execution, which could lead to a drop in performance due to focusing on their own movements (i.e., reinvestment, Masters and Maxwell 2008).

The study also showed that the positive indirect effect of trait mindfulness on the ability to deliver performance through cognitive competition anxiety was dependent on the level of trait mindfulness. Athletes with low-to-moderate trait mindfulness reported anxiety-based performance decrements, whereas athletes with high trait mindfulness did not. These results are in agreement with similar models of moderated meditation that found that the indirect effect of mindfulness on an outcome is dependent on the level of mindfulness (Adams et al. 2015). Thus, it may be promising to use the moderated-mediation model presented herein to examine other potential mechanisms of how mindfulness may positively affect behavior, i.e., through generally reducing negative thoughts and emotions and by reducing their influence on behavior.

Limitations and Further Research

The main limitations of the current study are its cross-sectional design, which does not allow for inferring causal relations between the variables, and the exclusive use of self-report inventories. The performance-delivery scale is a measure of an athlete's perception of his or her performance rather than a direct measure of performance. This perception of past performance could be significantly influenced by personal traits such as anxiety. Additionally, limiting the experience of performance to the last 3 months may not have included a truly high-performance situation for all athletes.

Further research will need to address these limitations, for example, by using longitudinal designs and including several and behavioral measures of performance. The presented model should be tested in one specific game or competition of high pressure or in an experimental performance situation with pressure induction. It will also be important to examine other mechanisms of action concerning the impact of mindfulness on performance-promoting behavior in demanding situations and how mindfulness can be practiced efficiently. Future research should also look at the influence of single aspects of mindfulness (e.g., focusing on the present moment, not reacting automatically to experiences, and accepting own thoughts and emotions) by using a larger number of participants and by measuring these aspects with multiple reliable and valid scales. Finally, it would be interesting to determine what "dose" of mindfulness practice is needed to increase trait mindfulness and ultimately increase performance (dose-response) and to determine whether people might be able to improve behavior (i.e., behave in a goal-orientated manner) in other performance environments (surgery, military, the performing arts, business, etc.) because they are mindful.

Despite the aforementioned limitations, our findings are important for everyone who wants to optimize his or her behavior in challenging situations, such as elite athletes, performing artists, or surgeons, as well as for people who try to help others optimize performance, for example, sport psychologists or coaches. In highly competitive environments, such as elite sports, everyone will experience negative emotions to some degree (Haberl and Peterson 2006). However, the most successful performers succeed by showing their best, even when they are experiencing unpleasant emotions or having negative thoughts. Thus, (sport) psychologists should teach clients not only how to change negative states but also how to perform well in a negative affective state. In this respect, we are convinced that mindfulness practice is a promising approach and that developing and validating mindfulness-based intervention programs for (elite) performers can help increase their trait mindfulness. This could help them to perform in challenging situations because it not only reduces negative affective states generally but also diminishes the influence of such states on behavior.

Compliance with Ethical Standards The research was conducted in accordance with APA ethical guidelines. All participants provided informed consent, and confidentiality and anonymity were assured.

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Anhang E

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Human Kinetics
CASE STUDY 7

Rowing Over the Edge: Nonfunctional Overreaching and Overtraining Syndrome as Maladjustment—Diagnosis and Treatment From a Psychological Perspective

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A rigorous training schedule with insufficient recovery can lead to nonfunctional overreaching (NFOR) or overtraining syndrome (OTS). Research has suggested the multifactorial etiology of these phenomena. Stressors that contribute to and are symptoms and consequences of NFOR and OTS and adjustment disorder are almost identical. In this case study of an elite rower, the author illustrates an intervention approach that can be taken when overtraining is viewed as a sport-specific form of adjustment disorder. The intervention involved treatment that improved the athlete's awareness of his basic biopsychosocial processes, developed sources of self-worth beyond athletic performance, and challenged his 1-dimensional athletic identity. The intervention included cognitive-behavioral therapy methods (e.g., autogenic training) and mindfulness- and acceptance-based interventions to enhance the athlete's psychological flexibility. Mood monitoring was used as a diagnostic and evaluative instrument. Intervention effectiveness was evaluated through an in-depth interview with the athlete. The consulting sport psychologist also engaged in reflection about treatment effectiveness and predominant challenges. Challenging the athlete and clarifying his personal values were judged to be very important. Evaluation suggested that viewing NFOR and OTS as forms of adjustment disorder may help us recognize the multifaceted nature of an athlete's maladjusted state and widen treatment options.

Keywords: adjustment disorder, psychological flexibility, staleness, underperformance

Training imposes stress on athletes, exhausting their biopsychosocial system to trigger an adaptation process, allowing them to cope better with the same stressor in the future (Meeusen et al., 2013). However, "some sports, like rowing, are about being mentally tough, and they're about mastering the pain and pushing your body hard. That kind of sport culture encourages overtraining" (Richardson, Andersen, & Morris, 2008, p. 159). The reported prevalence of overtraining varies widely, ranging from 5% to 60% (Birrer, Lienhard, Williams, Röthlin, & Morgan, 2013; Kreher, 2016). Given the severity of its symptoms and its impairment to quality of life, overtraining phenomena must be considered serious and career-threatening events. Using the story of an elite rower, I illustrate the advantages of diagnosing and treating nonfunctional overreaching (NFOR) and overtraining syndrome (OTS) by viewing them as forms of maladjustment (Jones & Tenenbaum, 2009).

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Overtraining and Maladjustment: Theoretical Considerations

Athletes train to enhance and optimize their performance. Studies investigating the influence of training volume, intensity, and frequency on athletic performance have generally found that athletes improved their performance with increases in training load (Gabbett, 2016). However, a rigorous training schedule with insufficient recovery, probably also caused by sources of nontraining stress, may lead to maladaptive responses in the form of injury and performance decrements. Unexplained performance decrements despite adequate rest are discussed in the literature using terms such as *overtraining, overreaching, staleness,* or *underrecovery* (Kreher, 2016). In awareness that the variety of terms used to describe this phenomenon could cause confusion, I define the relevant terms before presenting the case of the rower.

NFOR and OTS: Definition, Signs, and Genesis

In a European College of Sport Science (ECSS) and the American College of Sports Medicine (ACSM) joint consensus statement on OTS, Meeusen et al. (2013) emphasized the use of the term *syndrome* to express its multifactorial etiology. Regardless of the terminology used, training is not generally regarded as the sole causative factor. Other factors—such as inadequate nutrition, illness, and psychosocial stressors—also lead to prolonged maladaptation with prolonged and inexplicable underperformance. In the ECSS/ACSM definition, on which this paper is based, overtraining has been viewed as a process of intensified training that can result in functional overreaching, NFOR, or OTS (see Figure 1).

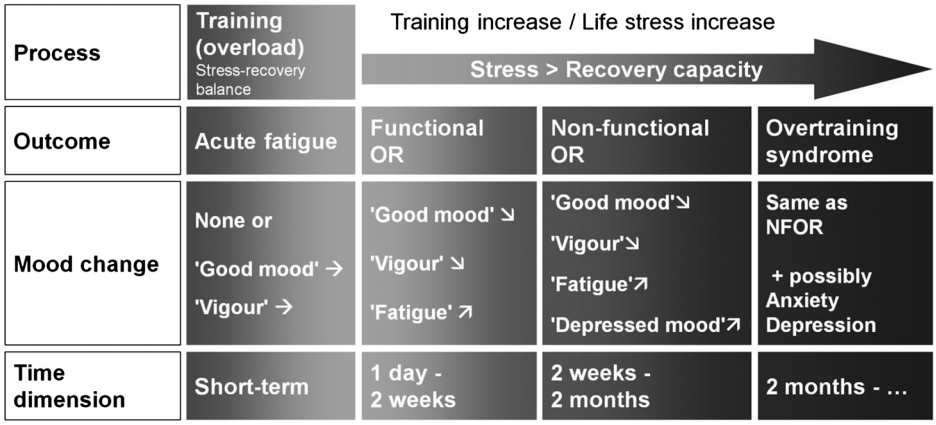

Figure 1 — Possible presentation of the different stages of training, functional overreaching (OR), nonfunctional overreaching, and overtraining syndrome according to Meeusen et al. (2013), with symptomatic mood changes as stage indicators.

Functional overreaching is a desired outcome of a planned training process in which an athlete suffers only temporary performance impairment. With appropriate rest and recovery, ranging from several days to up to 2 weeks, performance can be improved through supercompensation despite overreaching. This process is commonly referred to as tapering (Bosquet, Montpetit, Arvisais, & Mujika, 2007). However, sometimes, an athlete is not able to adapt positively as expected, given the athlete's experience during the previous periodized training process. If, after 14 days of total rest or training reduction of at least 20%, an athlete cannot return to the expected performance level, then NFOR might be diagnosed. In addition to the cardinal symptoms of high fatigue and reduced performance, Meeusen et al. (2013) cited other symptoms including psychological distress, psychological disturbance, and physiological consequences (e.g., higher prevalence of infections, most commonly those of the upper respiratory tract; see Table 1).

It is difficult to distinguish between NFOR and OTS. The signs and symptoms of each are often the same, but OTS typically presents with abnormal physiology, more severe symptoms, and a longer duration of decreased performance (more than 2 months). Furthermore, the diagnoses of NFOR and OTS are complex due to the retrospective nature of their definitions. Adequate training reduction and rest of at least 14 days in duration are crucial. In addition, it is vital to exclude organic diseases, infections, and lifestyle factors—such as dietary caloric restriction (negative energy balance), insufficient carbohydrate and/or protein intake, and iron deficiency—and to identify initiating events or triggers (Meeusen et al., 2013). Because overtraining is a phenomenon of excessive sporting behavior, the most certain trigger is a training-recovery miscalculation together with other sport-specific causes (see Table 2). However, as shown in Table 2, the apparent multifactorial etiology of NFOR and OTS means that a combination of multiple life stressors and a complex set of psychological factors are likely responsible for the prolonged maladaptation (Armstrong & VanHeest, 2002; Meeusen et al., 2013; Richardson et al., 2008).

To understand the mechanisms involved in the evolution of NFOR and OTS, it is also important to understand an athlete's sociocultural context, which can be viewed in terms of both risk and protective factors that influence stress load and recovery (Richardson et al., 2008). Risk factors can also be seen as stressors. Important factors stem from sport culture and societal norms, influences, and expectations. These include situational factors, as well as interpersonal influences from coaches, parents, and significant others, which produce patterns of reinforcement for overtraining and recovery behavior (see Table 2). Additional intrapersonal variables may include fitness level, stage of physical development, seeking love and approval for performance, and personality characteristics such as fear of failure, perfectionism, performance-based self-esteem, and athletic identity (Richardson et al., 2008).

Athletes with early signs of NFOR and OTS typically exhibit an increase in total mood disturbance that follows a specific pattern (see Figure 1). Specifically, during phases of peak overload, positive mood decreases and fatigue increases. Athletes with coping inadequacy will also react with decreased vigor. A maladaptive behavioral response is further characterized by ignorance or denial of the signs of a stress–recovery imbalance or an inability to react adequately to the stress situation. Therefore, athletes who find themselves underperforming may be tempted to compensate for their poor performance by training more often and more intensely. As a result of unsuccessful attempts to regain their desired performance level through an increase in training volume and intensity, good mood will continue to decrease and fatigue will continue to increase. In addition, vigor will decrease and depressed mood will increase (see Figure 1). A less severe outcome will be NFOR and a more severe outcome will be OTS. Generally, OTS has been characterized by a significant increase in depressed mood, which might be similar to that observed in clinical depression. In one study, 80% of OTS-diagnosed athletes showed signs of clinical depression (Morgan, Brown, Raglin, O'Connor, & Ellickson, 1987). A stable and moderate to high increase in depressed mood can be regarded as a cardinal sign of maladjustment of the biopsychosocial system, resulting in NFOR or OTS (Meeusen et al., 2013; Schwenk, 2000).

Adjustment Disorder: Definition, Signs, and Genesis

Adjustment disorder is a common problem, with a reported prevalence of 1–2% in the general population (Zelviene & Kazlauskas, 2018). It is present when stressful expected or unexpected events cause an individual to be confused and lost and negatively affect the individual's behavior, well-being, and mental health (American Psychiatric Association, 2013). Typically, one or more events occur to derail someone who is subsequently unable to adapt as well as the average person in the same situation. The symptoms are

Table 1 Symptoms and Consequences of Adjustment Disorder Found in the Literature and Their Occurrence as Symptoms and Consequences of NFOR or OTS

Symptoms and consequences	Occurrence in NFOR or OTS	Comments regarding occurrence in NFO and OTS literature
Symptoms		
sadness/depressed mood	✓	Symptoms of NFOR and OTS are described as symptoms of prolonged training distress, such as performance decrements, psychological disturbance, and psychological distress, especially mood disturbances such as decreased vigor, increased fatigue, depression, loss of motivation, drowsiness, apathy, devaluation or cynicism toward the sport, irritability, agitation, restlessness, emotional and physical exhaustion, lack of mental concentration, memory problems, anxiety, awakening unrefreshed, and heavy, sore, and/or stiff muscles (Armstrong & VanHeest, 2002; Jones & Tenenbaum, 2009; Kreher, 2016; Meeusen et al., 2013; Richardson et al., 2008).
hopelessness	✓	
decreased motivation	✓	
low mood	✓	
loss of pleasure	✓	
exhaustion	✓	
anxiety/excessive worry/fear	✓	
nervousness	✓	
restlessness	✓	
poor concentration	✓	
irritability	✓	
decreased self-esteem		
anger or disruptive behavior	✓	
loneliness/feeling isolated		
suicidal ideation		
sense of being overwhelmed/feeling as if trapped and have no other options	✓	
Consequences		
significant impairment in personal, family, social, occupational, or other important areas of functioning such as . . .	✓	The cardinal consequence or symptom in NFOR or OTS is persistent underperformance despite adequate rest or significant training reduction of 14 days. In addition, insomnia, weight loss, anorexia, increased immunological suppression, illness (most commonly upper respiratory tract infections), decreased heart rate at all exercise intensities (including at exhaustion), increased rating of perceived exertion at submaximal intensities, reduced blood lactate concentration at both maximal and submaximal intensities, and altered cognitive performance above the lactate threshold are described (Armstrong & VanHeest, 2002; Jones & Tenenbaum, 2009; Kreher, 2016; Meeusen et al., 2013; Richardson et al., 2008).
decreased performance in work or school	✓	
avoiding social interactions		
insomnia/poor sleep/change in sleeping habits (too much or too little)	✓	
lack of or increased appetite		
frequent crying	✓	

Note. NFOR = nonfunctional overreaching; OTS = overtraining syndrome. Symptoms and consequences of adjustment disorder based on DSM-5 and ICD-10. The characteristic feature is often a mixture of emotional and behavioral symptoms. Internalizing or externalizing symptoms often coexist, although one or the other may predominate.

not of sufficient specificity or severity to justify the diagnosis of another mental or behavioral disorder and must not be part of normal bereavement. When the stressor is removed or the individual has begun to adjust and cope, symptoms typically subside within 3–6 months.

The genesis and course of adjustment disorder are quite personal. Table 1 gives an overview of the most relevant symptoms. However, unambiguous symptomatological criteria in the *Diagnostic and Statistical Manual of Mental Disorders,* 5th edition (DSM-5; American Psychiatric Association, 2013) and the *International Statistical Classification of Diseases and Related Health Problems,* 10th revision (ICD-10; World Health Organization, 2016) are lacking (Casey & Bailey, 2011). Nonetheless, symptoms of low mood, sadness, worry, anxiety, insomnia, and poor concentration in response to a recent stressful event are likely indicators of adjustment disorder. Because major depression can present similarly, clinical judgment is of great importance in the diagnosis of adjustment disorder. Typically in adjustment disorder, mood disturbance is more noticeable when the person is cognitively engaged with the predisposing event—such as when he or she is speaking about it—whereas at other times, the individual's mood is normal (Casey & Bailey, 2011).

The ICD-11 definition of adjustment disorder offers a slightly new perspective (World Health Organization, 2018). The key symptomatology is still regarded as a maladaptive reaction to an identifiable psychosocial stressor or multiple stressors (e.g., divorce or conflicts at work), but the disorder is characterized by a preoccupation with the stressor or its consequences, including excessive worry, recurrent, and distressing thoughts about it and/or constant rumination about its implications, as well as by a failure to adapt to the stressor. For a diagnosis to be made, it must cause significant impairment in important areas of functioning. Depression, anxiety, avoidance, and impulsivity are described as additional symptoms.

NFOR and OTS as Adjustment Disorders: Maladjustment Syndrome in Athletes

Literature on NFOR and OTS stresses that they represent "the sum of multiple life stressors, such as physical training, sleep loss, exposure to environmental stresses (e.g., exposure to heat, high

Table 2 Typical Stressors Found in the Literature That May Cause Adjustment Disorder and Represent Possible Causes in the Development of NFOR or OTS

Characterization	Occurrence in NFOR or OTS	Comments regarding occurrence in NFOR and OTS literature
Identifiable stressor (DSM-5), significant life change, or stressful life event (ICD-10)	✓	
single	✓	Stressors are described as stemming from numerous sources, predominantly from the sporting environment, including excessive competition and training loads (exercise workload), monotony of training, and competitive stress (including excessive expectations from a coach or family members, injury, etc.), in combination with other stressors (Jones & Tenenbaum, 2009; Meeusen et al., 2013; Richardson et al., 2008).
recurrent	✓	
continuous	✓	
multiple (occurring simultaneously)	✓	
Affected integrity of an individual's social network (ICD-10), such as . . .	✓	
separation experiences (divorce or breakup of a relationship)	✓	Quality of relationships with teammates, coaches, and support staff and parental expectations are named (Jones & Tenenbaum, 2009). Social environments including relationships with family and friends and personal and emotional changes and problems (i.e., interpersonal difficulties; Armstrong & VanHeest, 2002; Meeusen et al., 2013; Richardson et al., 2008). Illness (most commonly upper respiratory tract infections; Meeusen et al., 2013; Richardson et al., 2008).
loss of a loved one		
financial problems		
continuous painful illness	✓	
illness that progressively worsens		
Major developmental transitions such as . . .		
marriage	✓	Transitions in the sport, such as new training environments, new levels (professional), major life events and previous life experiences (sport and nonsport) such as selection trials, change of marital status, parenthood, change of residence, etc. (Jones & Tenenbaum, 2009; Meeusen et al., 2013; Richardson et al., 2008).
parenthood	✓	
relocating	✓	
going to school	✓	
leaving home	✓	
retirement	✓	
Situational crises such as . . .	✓	
losing a job		Severe injury, poor performance, financial problems, failure in study commitments, or other life crises (Richardson et al., 2008).
failure to pass major exams	✓	
failure to succeed in a career	✓	
failure to achieve a cherished personal goal	✓	
serious physical illness		
Micro-stresses: little daily stressors that accumulate over time	✓	Daily hassles, inadequate nutrition, sleep loss, training monotony, exposure to environmental stresses (e.g., exposure to heat, high humidity, cold, or high altitude), occupational pressures, or school- or work-related demands (Armstrong & VanHeest, 2002; Jones & Tenenbaum, 2009; Meeusen et al., 2013; Richardson et al., 2008).

Note. NFOR = nonfunctional overreaching; OTS = overtraining syndrome. Stressors of adjustment disorder based on DSM-5 and ICD-10 criteria.

humidity, cold, high altitude), occupational pressures, change of residence and interpersonal difficulties" (Meeusen et al., 2013, p. 5). This bears a striking resemblance to the etiology of adjustment disorder. Table 2 gives an overview of stressors that may cause adjustment disorder, and these correspond with those responsible for the development of NFOR and OTS. Unsurprisingly, the symptoms and consequences of NFOR, OTS, and adjustment disorder are also almost identical (see Table 1). In addition, many individuals with adjustment disorder recover without treatment, because people have resources to cope with life stressors and adjustment-disorder symptoms (Zelviene & Kazlauskas, 2018). The same can be said about NFOR and OTS. According to Jones and Tenenbaum (2009), an athlete's overtrained state is more perceptible if it is considered an adjustment disorder. Viewing NFOR and OTS as specific forms of maladjustment widens the number of stressors that can be considered beyond excessive training load, while the key symptom remains prolonged underperformance. This facilitates the holistic treatment of the athletes, viewing them as whole individuals rather than only as athletes.

In this view, NFOR and OTS are regarded as more or less normal reactions (with clinically relevant symptoms) to a series of significant stressors. The expression *maladjustment syndrome in athletes* takes into account the athletic context, multifactorial etiology, and range of contributing stressors without classifying it as a clinical disorder. While NFOR and OTS, viewed as maladjustment syndromes in athletes, are generally caused by exposure to physiological stress, it is important to recognize that they develop in combination with other stressors, which are often trivialized or neglected by a sport-centered personality. It is also important to recognize that for competitive athletes with an identity

narrowly focused on their athletic role, experiences of prolonged underperformance and failure to meet important competitive goals may be threatening to self-esteem (Gustafsson, Martinent, Isoard-Gautheur, Hassmén, & Guillet-Descas, 2018). Such experiences may be seen as personal failures and may represent a loss of mental power, which an individual may wish to hide and of which he or she may be ashamed (Schwenk, 2000).

An important additional factor in an athletic context is that almost all athletes have found that an increase in training intensity and training volume (training harder and more often) leads to a better, more stable performance. Moreover, most athletes have had experiences of functional overreaching, in which after a period of heavy training load with signs of exhaustion and extreme fatigue, their performance returned to normal or supercompensated. Therefore, and because sport culture promotes being mentally tough and pushing past one's limits, athletes may be tempted to neglect the signs of NFOR and OTS. This aspect of sport culture is characterized by sayings like *No pain, no gain* and *Go hard or go home*. These dictums are counterproductive when taken out of context. In this kind of sport culture, athletes may try to hide their performance inadequacy, and it may push them to train excessively to protect their self-esteem (Gustafsson et al., 2018).

Context and Consultancy Philosophy

I have a master's degree in sport science and a master's degree in general psychology, and I am a sport psychologist certified by the National Federation of Psychologists. In addition, I completed a 1-year research and further education scholarship to investigate the relationship between mood and performance in the context of overtraining phenomena. I have authored research papers in this area (e.g., Birrer et al., 2013). At the time of this case study, I was working in a multidisciplinary sport and service center for elite athletes. In this position, I was conducting research, teaching, and practicing counseling in collaboration with sport scientists and physicians. This environment provided me the opportunity to develop and use advanced scientific knowledge and research from several academic disciplines to render applied services for the specific wants and needs of elite athletes and coaches. However, publication pressure at this institution is low, so various research findings have not been published.

My training in psychology was based primarily on a cognitive-behavioral perspective, so my first steps in designing an intervention were characterized by the application of psychological-skills training tools and cognitive-behavioral therapy (CBT) methods. After several years of working as an applied sport psychologist, I have found CBT methods limited, because I have experienced that sometimes athletes have many problems trying to control their thoughts and emotions. To address this problem, I started to use third-wave CBTs, which integrate mindfulness as a core concept (Hayes, 2004). I have found mindfulness and acceptance-based methods to provide a better understanding of psychological processes, and they seem to foster optimal human functioning. Although third-wave therapies build on behavioral and cognitive-behavioral methods, they suggest that functional behavior change is fostered not necessarily by a change in the content of thoughts and emotions but by a change in an individual's relationship to this content (Hayes, 2004). In addition, both classic CBT and third-wave CBT stress the importance of learning processes in the development and maintenance of functional behavior. Another main feature of third-wave therapies is the assumption that all psychological processes have a function (i.e., a purpose) or had a function during a person's ontogenetic development. In this sense, an individual is regarded as the expert on his or her own life.

To involve athletes in the therapeutic process, third-wave therapies often involve the use of psychoeducation to teach them, for example, why people experience certain thoughts and emotions. This component is essential in softening and changing dysfunctional behaviors and attitudes. In this way, athletes become actively involved in the counseling process, making it an "equal" exchange with the consultant. Coming to understand one's own behavior, which is often experienced as dysfunctional, as a normal, easily explainable psychological process often has a relieving effect by reducing shame and negative feelings experienced by athletes. It also strengthens the interaction and mutual relationship between athlete and psychologist.

Rowing Over the Edge: Greg's Case

The following case description originates from routine applied services in my consulting practice. The ethical guidelines of the European Federation of Psychologists' Associations were followed. In addition, the ethical guidelines of the National Psychological Association state that members may use information subject to confidentiality anonymously for didactic, statistical, research, or publication purposes. Information is considered anonymous if conclusions about specific clients cannot be drawn or can only be drawn with disproportionate effort. Accordingly, the data have been anonymized so that no unambiguous conclusions can be drawn about the athlete's identity. Because gender is irrelevant in this context, even the athlete's gender may not be accurately reported. As part of another research project, an insight interview was conducted approximately half a year after the athlete's return to competition as part of a series of interviews with formerly diagnosed and psychologically treated NFOR or OTS athletes. The athletes agreed by written consent that the information can be used for didactic, research, and publication purposes.

The consultancy was initiated by another sport psychologist who asked if I would be willing to take over the case of an overtrained athlete. Because I had experience investigating and treating overtraining phenomena as a scientist and practitioner, I agreed. At the beginning of the intervention, the athlete, let us call him Greg, was 21 years old and a member of the under-23 national team. He had successfully competed at previous junior European and world championships. At the beginning of the consultation during Calendar Week 26, he had cancelled the respective competitive season and was in medical treatment.

Intake and Needs Overview

Greg was referred by a colleague with whom he had already had two intervention sessions. Greg expressed the wish to work with a sport psychologist who had experience treating athletes with overtraining problems. Issues that had been discussed in the first intervention session with my colleague, which took place during Calendar Week 23, were mental toughness, overtraining, and disturbing factors stemming from the national-team environment and the suicide of a rowing friend. Greg stated in this session that the overtraining had almost been successfully overcome. After this first session with the colleague, Greg had a relapse. After a devastating performance test and the following consultation with a physician, Greg decided to stop training and competing (Week 24). In Week 25, Greg had the second intervention with my colleague, in which he expressed his desire to be referred to a more experienced sport psychologist.

In Week 26, weekly mood-state and stress-recovery monitoring started. In Week 27, my first intervention session with Greg took place, in which Greg expressed his need to analyze his overtraining and to find a way out of his crisis.

Case Formulation

Situational and Personal Characteristics. The following are the situational and personal characteristics of Greg's case highlighted from the perspective of NFOR and OTS as special forms of adjustment disorder:

- Significant increase in weekly training volume: $M = 16.6$ hr (8.75–22.75 hr)
- Suicide of a close friend
- Change from the open category to lightweight rowing (individual weight limit 72.5 kg, team mean limit 70 kg)
- Change of discipline (scull to one oar)
- Breakup with girlfriend
- End-of-term school examinations
- Change of training environment (from club level to the A-National team)
- Disagreement with national coach concerning the required weight limits
- Perfectionistic personality with very high personal standards

The situational characteristics demonstrate that multiple stressors (see Table 2) were simultaneously present in Greg's life. Some of the stressors were single events, and some of them were recurrent and continuous.

Etiology. Greg's perspective concerning the evolution of his maladjustment was gleaned from notes in his personal training log. To better illustrate Greg's thoughts and feelings, the description is enriched with quotes from that log. Some of the additional information and quotes are from the intervention sessions, as well as from the aforementioned in-depth interview. This analysis begins with data from Calendar Week 13 of the previously referenced year and aims to provide a good overview of the situation and sport culture in which Greg was trapped.

> Calendar Week 13: Personal quote: "The national coach set my weight lower than he had promised me a week before the selection races for the u-23 squad. I had to lose 2 kilograms by sweating on that day, but I still managed to win the qualifiers afterward. After the competition, I told him about my weight problems and told him that my doctor and my nutritionist had discouraged me from losing any more. Nevertheless, this did not interest him very much. He insisted that I have to lose more weight. Therefore, I've done what I was asked for."
>
> Week 14: Best performance test ever, personal record in power test, total loss of 7 kg weight..
>
> Week 15: Light cough.
>
> Week 16: Worsening of cough, weight-reduction procedure, enhanced training intensity. Reduction of training volume. Personal quote: "And thus when I noticed the physical problems I thought I would have to prove me something or so and go on with training. I didn't take that seriously at all and thought, yes, I had a bit of a cough and yes, that will be gone after a few weeks."
>
> Week 17: Worsening of cough, further weight-reduction procedure, enhanced training intensity for competition preparation, weight on race day 2 h before competition 70.6 kg. First signs of asthma. Further reduction of training volume. Personal quote: "Although I had been suffering from a cough for 2 weeks, I drove two races on the first day of the regatta. Two hours before the race, I had to weigh 70.8 kilograms, which I managed to do by a narrow margin. After the first race with the severe breathing problems, the u-23 team manager advised me to participate in the second race, as well. In the evening, I was very disappointed because I was not honest with myself by rowing the races at all. In addition, I also felt exploited and betrayed."
>
> Week 18: Severe cough, performance inability, asthma. Consultation with a pneumologist with no clinically relevant findings and no appropriate therapeutic treatment options. Further reduction of training volume.
>
> Week 19: Cough slightly better, asthma. Reduced training volume.
>
> Week 20: Light cough, asthma, increase in training volume. Personal quote: "This week, I just had the feeling that despite coughing and a bad mood, I should train again."
>
> Week 21: Worsening of cough, performance inability, and asthma. Renewed reduction of training volume.
>
> Week 22: Stagnation of cough, fatigue, feeling powerless, performance inability, and asthma. Reduction in training volume.
>
> Week 23: First intervention with a sport psychologist. Worst performance test ever (nearly 100 W less than in Week 14), cough when exercising with heart rate >120, increased heart rate and lactate concentration at all test intensities. Feeling powerless, performance inability, asthma.
>
> Week 24: Cough, low sleep quality, fatigue, feeling powerless, performance inability, headache, diarrhea, indisposition, asthma. Consultation with the general physician of the rowing federation. Significant dehydration was diagnosed. Decision to stop training and competing.
>
> Week 25: Cough, low sleep quality, fatigue, feeling powerless, performance inability, headache, diarrhea, indisposition, asthma. Second intervention with a sport psychologist, in which Greg expressed his wish to consult with a psychologist experienced in working with overtrained athletes.
>
> Week 26: Cough, low sleep quality, fatigue, feeling powerless, performance inability, headache, diarrhea, indisposition, asthma. Beginning of mood and stress-recovery monitoring.
>
> Week 27: Same symptomatology. Beginning of counseling.

Holistic Treatment of NFOR/OTS: Treating the Person, Not the Athlete

Greg was referred to treatment with a diagnosis of NFOR or OTS by a physician and another sport psychologist. Athletes with early signs of NFOR and OTS typically exhibit a specific pattern of mood disturbances, so as suggested by Meeusen et al. (2013), we arranged weekly mood and stress-recovery monitoring. The results of 10 weeks of mood monitoring are presented in Figure 2. Mood monitoring was conducted using Abele-Brehm and Brehm's (1986) *Befindlichkeitsskalen,* a mood questionnaire similar to the Profile of Mood States (McNair, Droppleman, & Lorr, 1992). In contrast to the Profile of Mood States—which has one positively connoted scale and five negatively connoted scales—the

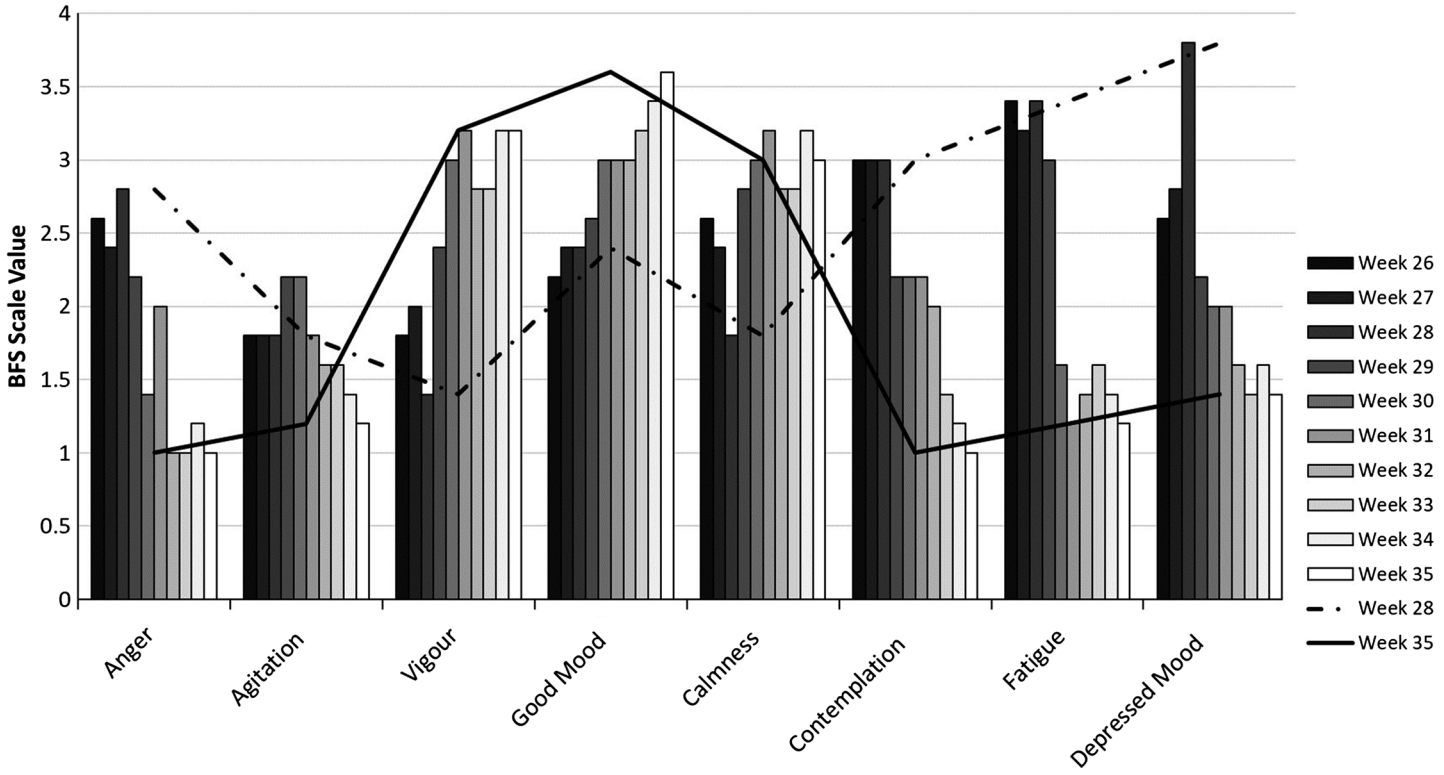

Figure 2 — Magnitude of changes in mood states on the Befindlichkeitsskalen Scale during the 10-week monitoring period (raw values). Lines represent a typical iceberg profile of nonfunctional overreaching (Week 28) and a stress–recovery balance profile (Week 35).

Befindlichkeitsskalen contains four positively and four negatively connoted scales. This allows for a more balanced view of the individual's mood. Mood data revealed that the first weeks of the intervention were characterized by high levels of anger, fatigue, depressed mood, and contemplation; moderately high agitation; moderately low vigor; and low good mood and calmness. This mood combination is symptomatic of NFOR/OTS (Meeusen et al., 2013) and adjustment disorder (American Psychiatric Association, 2013). In addition to the cardinal symptom of significant performance inability and upper respiratory illness, Greg presented a complex combination of single (e.g., suicide of a rowing friend), recurrent (e.g., conflicts with his coaches), and continuous (e.g., significant dietary restriction) stressors stemming from his sport, private life, and educational situation.

Overall, Greg showed several clinically significant symptoms of poor adjustment toward environmental stressors, which can be considered atypical of what would normally be expected given his performance level and training history. His level of distress and impairment reflected a measurable degree of breakdown in biological, psychological, and social functioning. Furthermore, he showed a high level of contemplation reflected in mood monitoring during the first 4 treatment weeks (together with the other mood characteristics; see Figure 2). This suggested preoccupation with the stressor and/or its consequences, including recurrent and distressing thoughts about performance inability and constant rumination about its causes and implications, which are new diagnostic features in the recent ICD-11 definition (World Health Organization, 2018). Furthermore, in the first few intervention sessions, Greg expressed anger toward his coaches and the federation regarding the weight-reduction procedure and other issues.

In summary, a diagnosis of both adjustment disorder and NFOR/OTS or maladjustment syndrome in athletes appeared justified. The following quote offers insight into Greg's state: "When I noticed that I had to break off the season, everything became a little meaningless. I didn't care if the sun was shining or not. My energy tank was empty and remained so for about 2 months. Only through the intervention did my mood slowly improve."

Given that the biopsychosocial nature of maladjustment is characteristic of NFOR and OTS, an appropriate treatment should address all three areas. In addition, Casey and Bailey (2011) reported that "brief therapies are regarded as being the most appropriate, with the exception that, when stressors are ongoing, prolonged supportive measures may be necessary" (p. 15). Reported state-of-the-art treatments for adjustment disorder span a range of supportive psychoeducational, cognitive. and psychodynamic approaches. Casey and Bailey also suggested the following treatments: relaxation techniques to reduce anxiety and techniques to verbalize fears and emotions, explore the meaning the stressor has for the individual, and find alternative responses to stressors when self-destructive behavior is involved. In addition, mindfulness and/or acceptance-based interventions have been shown to be effective (Forman et al., 2012; Srivastava, Talukdar, & Lahan, 2011; Sundquist et al., 2015) and have been recommended for the treatment of NFOR and OTS by Birrer et al. (2013).

Intervention

Effective treatment requires an understanding of the interplay between all stressors and the individual's coping resources, so the first intervention session was used, in part, to evaluate Greg's

personal context. Data concerning his stressors have already been presented. Greg's family was identified as an important personal resource. In the course of identifying Greg's sources of self-esteem, he realized that his only interests were related to rowing. Earlier in his life, he had played an instrument and engaged in other activities besides school and rowing. Due to the great importance rowing had in Greg's life, his performance inability was an extreme threat to his self-esteem. A sport-centered, one-dimensional athletic identity might push athletes to train excessively (Gustafsson et al., 2018), even when they are already fatigued and exhausted. In addition, in this first session Greg discussed what he liked to read and what music was on his play list. He mentioned that he had been reading Nietzsche, and most of the titles in Greg's music play list of this period were in a minor key, which led to the assumption that most activities in which Greg engaged after ceasing training and competition had placed him in a sort of mood-maintenance mode (see mood–behavior model; Gendolla, 2000).

Furthermore, in this first phase of intervention, Greg disclosed many negative emotions. Especially when speaking about his performance inability and situational and personal factors, mood disturbances were dominant, and Greg was tearful and cried several times. Consequently, Greg's task was to engage consciously in a mood-repair mode in which he would deliberately choose activities, music, and readings with a mood-enhancing impact. In addition, he was encouraged to explore activities outside the sport that he perceives as fun and fulfilling.

In accordance with the ECSS and ACSM's (Meeusen et al., 2013) recommendations to treat NFOR and OTS with rest, Greg's physician forbade him from participating in any training activities. Nevertheless, he had a strong desire to be physically active. In collaboration with the physician, it was decided that Greg would be allowed to gradually build in some physical activity. The rule of thumb was that the activity could not be regarded as training but as leisure (e.g., he was allowed to stroll in nature or engage in movement on a whim). Experience in the treatment of overtrained athletes has suggested that it is crucial to reduce not only training volume but also, and more important, training intensity (Meeusen et al., 2013).

Intervention planning was based on my intervention philosophy and training as a psychologist. The intervention comprised a mixture of elements of CBT, psychological-skills training, mindfulness, and acceptance-based interventions (acceptance and commitment therapy, ACT; Hayes, 2004), and the application of harmonious/obsessive passion constructs (Vallerand et al., 2003). To address Greg's history of stressors, much time was invested in sorting out his personal situation with the help of a developmental perspective on the transitions faced by athletes based on Wylleman and Lavallee's (2004) life-span model. Emphasis was placed on Greg's life-balance and life-span management, because transitions always hold the potential for crisis. Values are considered important determinants of human behavior (Hayes, 2004), so a key role in this process was the clarification of Greg's personal values, which is one of the six ACT core processes.

Many methods can be used for value clarification. In this case, the Life Values Inventory (Crace & Brown, 1996) was used. The results formed the basis for setting goals for the near future (that is, translating values into targeted action; cf. the committed action process of ACT, Hayes, 2004). In this process, Greg realized conflicts between certain values in his life (e.g., conflicts between the fulfillment of health and activity, privacy, and independence on one side and achievement on the other side entailed an intrapersonal conflict leading to feelings of ambivalence). The conscious recognition of conflicts is an important step in increasing self-concordance. High self-concordance is associated with more efficient goal pursuit and goal achievement (Koestner, Lekes, Powers, & Chicoine, 2002), because unresolved issues get in the way of value fulfillment and enhance psychological inconsistency. The aim is to make a person aware of his or her affective network, link it to everyday life, and harmonize it with superordinate association patterns (e.g., self, reality, or cultural values). The aim of these considerations is to recognize conflicts as far as possible before the formation of intentions. This should facilitate an increase in self-concordance (Koestner et al., 2002).

Enhancement of personal meaning was used to help Greg develop his one-dimensional athletic identity into a multidimensional personality (see self as concept process in ACT; Hayes, 2004). This diversifies the sources on which one's self-esteem is built. In Grawe's (2007) consistency theory, the need for self-esteem enhancement or self-esteem protection is one of four basic psychological needs. Grawe's theory states that the human system strives to avoid inconsistency. Inconsistency leads to psychological dysfunction and maladaptive behavior in the short term and mental disorder in the long term. Value clarification enhances congruency and psychological functioning.

Methods to consciously be in the present moment (mindfulness exercises) and psychological-acceptance strategies (e.g., viewing thoughts and emotions as acceptable as they are, with no need to alter or reduce them) were part of Greg's intervention program from the beginning. These two core ACT and mindfulness processes enhanced Greg's awareness of training intensity and recovery aspects (including subjective feelings affecting pain, fatigue, and recovery), which was also an important goal of the intervention, especially when Greg gradually returned to training. This process was accompanied by psychoeducation on the function of mood, which was facilitated by evaluations using the results of the aforementioned mood monitoring.

Greg was also taught autogenic training to facilitate the reestablishment of his emotional balance and enhance his recovery capacity. Both autogenic training sessions and mindfulness meditations were recorded on tape, and Greg was able to use the records at home. The autogenic training session lasted 22 min at the beginning, which was gradually reduced to a length of 10 min. To check the physiological effects of the autogenic training, autogenic training sessions were monitored using biofeedback equipment at the beginning of counseling and 10 weeks later. According to his training log, Greg executed 31 autogenic training sessions in a 10-week period. Because most of the mindfulness meditations were informal in nature (e.g., mindful rowing), Greg did not log these sessions systematically. In addition, because people are normally fused with their thoughts, emotions, and bodily sensations (Hayes, 2004)—which is especially crucial for dysfunctional thinking and dysfunctional attempts to control unpleasant feelings—methods of acceptance and cognitive defusion were adopted to increase Greg's ability to step back psychologically from his distressing internal experiences (thoughts, emotions, and bodily sensations) and view them as functional processes rather than absolute truths (Hayes, 2004).

Resumption of training was individualized on the basis of previously agreed-on physical and psychological signs and symptoms (supported by the mood monitoring), with clear criteria of progression to the next training level, stagnation on the same level, or returning to the previous level. Communication with the coach was facilitated by selecting a new personal coach who was

thoroughly familiar with Greg's maladjustment history and allowed him to discuss his physical, mental, and emotional concerns. In this phase, it was important to help Greg deal with overmotivation in training situations. It seems that for athletes returning to training after NFOR or OTS, it is difficult to train in the planned intensities, especially when training in a group setting. Not being able to train with the same intensities as one's training partners is self-esteem threatening (Armstrong & VanHeest, 2002). Consequently, athletes in an NFOR or OTS state or in recovery from such a state are always in danger of training at higher intensities than planned because their already weakened self-esteem will suffer even more when they must fall behind their training partners to maintain the intended training intensity. To tackle this challenge, methods of committed action were used (Hayes, 2004). Accordingly, implementation intentions (Gollwitzer & Sheeran, 2006) were adopted with success. In addition, mindful rowing was established as a form of informal mindfulness training, which also allowed Greg to exercise this core psychological-change process in the environment in which the behavioral change was needed.

Normally, athletes become engaged with their sport because they feel pleasure while doing it, and their basic psychological needs (Grawe, 2007) are nourished by the activity. Nevertheless, in controlling, overdemanding, and rejecting environments, the internalization of behavioral regulations might be characterized by intra- and interpersonal pressure and might become "obsessive" (Vallerand et al., 2003). People with obsessive passions pursue the activity eagerly and compulsively because of the reassurance and ego-affirming moments it provides. Athletes with an obsessive passion for their sport feel compelled to engage in their activity, which enhances their risk of engaging in dysfunctional behavior connected with their sport. It is reported that people with a more obsessive passion experience more conflicts with other life activities, tend to engage in their activity even when the circumstances suggest that engagement is harmful, and have more ruminative thoughts about the activity and lower levels of positive affect (Mageau et al., 2009). Greg, like many NFOR and OTS athletes, also showed many signs of obsessive passion. Consequently, we worked on the rediscovery of Greg's intrinsic motivation, which was also connected to his selection of a new personal coach. Together with the identification of personal values, we discussed the initial reasons Greg was playing his sport. Two key ideas were used in this process: "Allow that rowing is fun!" and "Consider rowing a game."

In the stage during which Greg was able to start training in the boat again—which was approximately 13 weeks after he was forced to end his season—time was invested to work on strategies to enhance training quality, as well as his self-awareness regarding signs of stress and recovery. Overall, the interventions were targeted to allow Greg to be a whole person who is also an athlete and to be able to live a rich and value-based life.

Evaluation of the Intervention and Its Outcomes

After the treatment, Greg was able to pursue his career by competing at major international events such as world championships and the Olympic Games. Approximately 1 year after he had to end his season because of NFOR/OTS, Greg was rowing his first competition after the OTS. In that year, he received 14 hr of counseling spread over 10 sessions. Nevertheless, the return to training and competition took longer than he expected. As can be seen in Figure 2, Greg's mood states progressively returned to normal over the 10 weeks of monitoring. In addition, some mood scales appear to have changed in a stepwise fashion (e.g., contemplation). During an interview half a year after his return to competition, Greg talked about the significant factors in the counseling process:

> It was important for me that I had been challenged by the sport psychologist with difficult and personal questions, which forced me to more and intense reflection. . . . Another decisive factor was certainly that I had to deal with my values and visions of the future and could no longer think only in the context of rowing. This certainly helped me not to see everything in the context of sport anymore, to think beyond the present state and not to regard it as my permanent lot. . . . Afterward through the relaxation and mindfulness techniques, I learned to promote recovery.

Greg offered the following advice to other athletes: "Sometimes it takes more courage to skip a workout than to just stubbornly go through the training plan."

Reflections, Lessons Learned, and Implications

Viewing Greg's OTS as a training maladjustment in an athlete—similar to a subclinical or clinical form of adjustment disorder—widened the search for symptomatology and causes beyond the phenomenon of too much training. Supporting evidence for maladjustment includes environmental conditions; a "no pain, no gain" or "no excuses" culture; the presence of burdening psychosocial factors; nutritional issues and viral diseases, especially upper respiratory tract infections; a significant increase in training load within the last 6 months; and personality characteristics including athletic identity, perfectionism, or obsessive sport-related passion. These were all present in Greg's case.

In treatment, the goal was to enhance Greg's awareness of his basic biopsychosocial processes, facilitate his acceptance of unpleasant physical and emotional sensations, tackle his overreaching athlete identity, and attend to his predominant performance-related sources of self-esteem. In this process, Greg's values served as a kind of guideline on which to focus his behavioral goals (something one wants to do) as opposed to his outcome goals (something one wants to have). Values include global internal representations of what is considered personally right and important in life (Hayes, 2004), so value clarification helped Greg learn to satisfy his basic psychological needs. Greg felt challenged by personal questions and was forced to engage in more and intense reflection, which he perceived as helpful. In addition, mindfulness and acceptance-based interventions seemed well suited to achieving the mentioned objectives.

In terms of a reflection on the intervention, my background as a psychologist who researches and treats overtraining using mood monitoring, has personal training with classic CBT, and uses mindfulness and acceptance-based interventions influenced the choice of intervention and overall decision making. It also helped me gain the athlete's trust and strengthen treatment compliance. In addition, although Greg found it helpful that I challenged him with personal and difficult questions to engage him in more and intense reflection and to recognize, legitimize, and work through difficult issues, this was a potential pitfall and endangered the working alliance. For example, it was a challenge to empathize with Greg and take his personal dreams and goals seriously while also challenging his athletic identity by relativizing the value of an athletic career, including the value of physical performance and athletic success. So, to engage Greg in a joint exploration of

obstacles without straining the working alliance, I tried to deliberately nurture Greg's basic psychological needs (Grawe, 2007) during counseling. When Greg expressed a strong need to exercise, I supported him with this wish against the initial prescription of his physician. Although I was convinced that it was important for Greg to integrate a small amount of physical activity into his weekly routines, I could not be sure this was the right decision. Weekly mood monitoring was helpful in estimating Greg's physical and psychological development and provided some confirmation that integrating physical activity was the right decision.

Exploring new sources to nourish Greg's basic psychological need for self-esteem enhancement was also significant, as it was striking for both Greg and me that he had no sources other than his athletic career at that time. In this process, I learned that NFOR/OTS represents a significant personal crisis. In this respect, and given Greg's tearfulness during the first few intervention sessions, sport psychologists are well advised to prepare for this. A self-compassionate stance might be helpful in coping with these situations.

Conclusion

Greg's case demonstrated that an "overtrained state" can be caused by a combination of any simultaneously occurring stressors of any severity and that it must be understood in terms of these combined influences in the respective sport culture. Results of mood monitoring suggested that moods are an important indicator of a person's overall condition and should always be taken seriously as behavioral indicators. This was also reflected by Greg's neglect of his decreasing mood states and other warning signs during the course of his maladjustment. Performance and mood disturbances are key symptoms of training maladaptation, so monitoring an athlete's mood and stress-recovery state appears to be very useful in the support of elite athletes. Athletes, as well as coaches, psychologists, and psychology trainees, should be taught that mood states provide significant information.

To treat NFOR/OTS effectively, practitioners must shift their focus from training and recovery schedules to a comprehensive understanding of the athlete's holistic biopsychosocial stress-response process (Jones & Tenenbaum, 2009). This widens treatment options to include psychological and social strategies. The person as a whole—and not just the athlete—will be treated with respect to his or her personal history, values, and the role of sport in his or her present and future life. Overall, Greg benefitted from psychological and behavioral flexibility by developing a constructive response to stress (Hayes, 2004), which is supported by recent research (Chang, Wu, Kuo, & Chen, 2018) suggesting that psychological flexibility prevents emotional exhaustion in subjects with high levels of athletic identity.

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