



University of Thessaly
Department of Physical Education and Sport Sciences
Greece

Relationships between Mindfulness, Flow and Enjoyment

by

Bart Adins

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Approved by supervising committee:

Main Supervisor: Antonis Hatzigeorgiadis, Assistant Professor

Supervisor 1: Athanasios G. Papaioannou, Professor

Supervisor 2: Ines Pfeffer, Assistant Professor

Trikala, Greece, 2013

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Abstract

The current study investigated the relationships between mindfulness, flow and enjoyment, and attempted to identify whether flow mediates the relation between mindfulness and enjoyment. The sample consisted of 307 German speaking participants (mean age 26.47) who all participate in sports. Dispositional mindfulness was assessed with KIMS-short (Höfling, Ströhle, & Michalak, 2011), Flow with Flow-Kurzfragenboog (FKS; Rheinberg, Vollmeyer, & Engenser, 2003) and Enjoyment with German Version of Physical Activity Enjoyment Scale (Jedauc et al, 2012). Preliminary analyses showed sufficient reliability for all scales and subscales. Examination of the bivariate correlations revealed positive correlations between mindfulness and flow ($r = .27, p < .01$), mindfulness and enjoyment ($r = .20, p < .01$) and between flow and enjoyment ($r = .47, p < .01$). Furthermore, the findings showed that competitive athletes report higher scores than recreational athletes on flow ($p < .01$), enjoyment ($p < .01$) and the mindfulness scales *acting with awareness and undivided attention* ($p < .05$) as well as *observing external stimuli* ($p < .01$). Regression analyses were used to test the mediation hypothesis. The analysis showed that the significant relationship between mindfulness and enjoyment became insignificant ($.08, p = .16$), after controlling for flow as a mediator. A significant effect of mindfulness on flow ($.27, p < .05$) and flow on enjoyment ($.45, p < .05$) was reported so we can suggest that flow is a mediator on the relationship of mindfulness and enjoyment. Flow will be higher for athletes who report higher mindfulness and in turn this higher flow leads to more enjoyment. This article furthermore discusses the strengths and weaknesses of the study and gives directions for future research.

Key words: present moment focus, awareness, flow experience, fun, sport, mediation

Table of content

Introduction	7
Literature review	9
Mindfulness	9
Conceptualization	9
Dispositional mindfulness research	12
Mindfulness practice in sport	13
Thoughts suppression and ironic processes	14
Conclusion	14
Flow	15
Conceptualization	15
Flow research	17
Conclusion	20
Enjoyment	20
Conceptualization	20
Enjoyment research	22
Conclusion.....	23
Linking mindfulness, flow and enjoyment	24
Method	26
Participants	26
Procedure	26
Measures	26
Mindfulness.....	26
Flow.....	27

Enjoyment.....	27
Statistical Analysis.....	28
Results.....	29
Preliminary analyses.....	29
Differences between recreational and competitive athletes	31
Differences in means.....	30
Differences in correlations.....	33
Mediation effect.....	35
Discussion.....	37
References.....	41
Appendix.....	51

Tables

Table 1: Descriptive statistics and reliability for all variables	29
Table 2: Correlations between all variables.....	31
Table 3: Differences in mindfulness flow enjoyment as a function of sport level	32
Table 6: Correlations for recreational and competitive athletes	34

Figures

Figure 1: The hypothesized mediation effect.....	25
Figure 2: The mediational role of flow in the mindfulness - enjoyment relationship.....	36

INTRODUCTION

Mindfulness is a way of directing attention with origins in Eastern philosophy but is increasingly practiced and discussed in Western culture (Kabat-Zinn, 2004). In other fields of psychology such as clinical psychology, the use of mindfulness is increasing and large amounts of research on the effectiveness can be found (Hofmann, Sawyer, & Witt, 2010; Chicsa and Seretti, 2010). “The awareness that emerges through paying attention in a particular way: on purpose, in the present, and non-judgementally” is how Kabat-Zinn (1994, p.4) defines mindfulness. Phil Jackson, by many considered the best basketball coach ever, said “Things are more likely to go your way when you stop worrying about whether you’re going to win or loss and focus your full attention on what’s happening right this moment”. By focussing on accepting a situation without judgement and living it in full awareness, attention gets directed to the present-moment instead of past or future. This clearly helps the performance of athletes by for example helping concentration, the ability to focus on the task at hand while ignoring distractions (Aherne, Moran, & Lonsdale, 2011).

Lack of concentration is also a pivotal factor in influencing flow according to Jackson (1995). Flow is a mindset that typically occurs when an individual perceives a balance between the challenges associated with a situation and his or her capacities to meet those demands. It’s characterised by complete absorption in the task as well as enhanced performance (Csikszentmihalyi, 1990). When artists, athletes, or creative professionals describe the best times experienced in their occupations, they all mention this flow experience and its balance between challenges and capacities. People who are in a flow are so involved in the task that they report to forget about time and fatigue. Flow is also believed to be a crucial opponent of enjoyment (Csikszentmihalyi, 1975). Kimiecik and Harris (1996, p. 259) define enjoyment as “an optimal psychological experience that leads to pursuing an activity for its own sake and associated with positive affective experiences”. As it will be further argued,

flow and enjoyment should not be used as synonyms but the definitions certainly have a lot in common.

The purpose of this current study is to research the relationship between dispositional mindfulness, a relatively new concept in sport psychology and flow and enjoyment, two concepts that have been studied longer in sport psychology.

LITERATURE REVIEW

Mindfulness

There is empirical evidence that dispositional mindfulness is a performance-relevant trait in sports and mindfulness-based interventions may be helpful for athletes (Birrer, Röhrlin, & Morgen, 2012). Furthermore, Birrer, et al. add in their review on mindfulness in sport psychology that dispositional mindfulness is related to more flow, less fear and fewer task-irrelevant thoughts but that more high-quality studies are needed. Mindfulness seems to have important implications in sport and interest in the field is increasing but research in sport is still scarce.

Conceptualization

Although the aforementioned definition by Kabat-Zinn in 1994 is the most cited definition of mindfulness, there have been many different operationalizations of mindfulness and its components in recent literature. One important distinction that should be made is between mindfulness practice and dispositional mindfulness. Dispositional mindfulness is the tendency to be mindful in everyday life, whereas mindfulness practice refers to the techniques used to foster mindfulness (Birrer, Röhrlin, & Morgan, 2012). They are two related but different constructs (Thompson, & Walz, 2007). Evidence exists that formal mindfulness practice leads to more dispositional mindfulness (Carmody, Baer, Lykins, & Olendzki, 2009). Other factors that influence dispositional mindfulness are informal practice (Kabat-Zinn, 1990), psychotherapy (Martin, 1997), individual genetic (Way, Creswell, & Eisenberger, 2006) and developmental differences (Greenough, & Black, 1992).

Differences can also be found in the broadness of the mindfulness conceptualization. Brown and Ryan (2003, 2004) suggest that there is only one single factor in mindfulness: awareness of and attention to present events and experiences. The Mindful Attention

Awareness Scale (MAAS; Brown & Ryan, 2003) is constructed with this single scale.

Bishop et al. (2004) proposed two dimensions of mindfulness: (1) *self-regulation of attention in the present moment* and (2) *the attitude of openness, willingness, and awareness of experience in the present moment*. The first factor is a mental skill or state, whereas the second factor accounts more personality characteristics that underlie mindfulness tendencies and is therefore more relevant for the current research questioning dispositional mindfulness. Research found support for both factors. Valentine and Sweet (1999) found support for self-regulation of attention finding that individuals who did meditation had mindfulness skills that helped distributing attention and increasing present-moment awareness in response to unexpected events. Furthermore, research by Wenk-Sormaz (2005) showed that brief exposure to mindfulness techniques improves self-regulation of attention tested by Stroop interference and flexibility in word production. Bishop's second component of mindfulness, the attitude of openness, willingness, and awareness of experience in the present moment, was also supported. Anderson, Lau, Segal and Bishop (2007) had participants undergo a mindfulness course and compared the results to a control group finding greater emotional well-being and mindfulness.

The Kentucky Inventory of Mindfulness Skills (KIMS; Baer, Smith, & Allen, 2004) conceptualizes mindfulness as a set of interrelated skills (Dimidjian & Linehan, 2003). This approach is based largely on dialectical behavioural therapy (DBT) and lead to four dimensions: (1) *observing internal and external stimuli*: observing, noticing and attending to stimuli comes back in almost all descriptions of mindfulness. Both internal – such as cognitions and emotions – and external – such as smells and sounds – are part of this category. (2) *describing and labelling phenomena non-judgementally*: Although labelling with words is not always advised by teachers from the Buddhist tradition, the second dimension of KIMS is describing, labelling and noticing phenomena. Important is that this is

done non-judgementally and without analysing conceptually. (3) *acting with awareness and undivided attention*: focussing on one thing at a time and giving full attention to the activity one is in. (4) *accepting events or experiences without judging them*: non-judging is different from being passive or resigning but means to accept reality as it is and refrain labels such as good/bad and right/wrong.

The structure of KIMS inspired the five factors in the more recent Five Facet Mindfulness Questionnaire (FFMQ; Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006): (1) *observe* – noticing or attending internal and external experiences, (2) *describe* – labelling internal experiences in words, (3) *act aware* – attending to activities of the moment, (4) *non-react* – tendency to allow thoughts and feelings to come and go and (5) *non-judge* – non-evaluative stance toward thoughts and feelings.

Coffey, Hartman, and Fredrickson (2010) ran exploratory and confirmatory factor analysis, and structural equation models to gain more insight on the factor structure of mindfulness. The results showed two factors: (1) *present-centered attention* and (2) *acceptance of experiences*. They suggested that other components are consequences of mindfulness rather than components. The most recent measurement instrument is the Comprehensive Inventory of Mindfulness Experiences beta (CHIME- β ; Bergomi, Tschacher, & Kupper, 2012). A review was made of the aspects of eight mindfulness questionnaires and nine aspects of mindfulness were identified. The authors suggest conceptualization with one factor covering self-regulation of attention as described by Bishop and colleagues (2004) and two mindful orientation factors: (1) *self-accepting, non-judgmental, insightful, and non-reactive stance towards experiences*, and (2) *open, non-avoidant presence*.

Dispositional mindfulness research

In non-athlete samples, mindfulness has been associated theoretically and empirically with psychological well-being (Keng et al., 2011). Dispositional mindfulness has shown associations with higher levels of pleasant affect, sense of autonomy, optimism, competence, self-esteem, vitality and life satisfaction (Brown & Ryan, 2003). Higher agreeableness (Thompson & Waltz, 2007), conscientiousness (Thompson & Waltz, 2007) and empathy (Dekeyser, Raes, Leijssen, Leysen, & Dewulf, 2008) were also found to characterise participants who score higher on dispositional mindfulness. On the other hand there is negative relationships with depression (Brown & Ryan, 2003; Cash & Whittingham, 2010), neuroticism (Dekeyser et al., 2008), rumination (Raes & Williams, 2010), social anxiety (Brown & Ryan, 2003; Dekeyser et al., 2008), difficulties in emotion regulation (Baer et al., 2006), and dissociation (Baer et al., 2006).

Siegel (2007) reports findings that indicate how mindfulness enhances bodily functioning, strengthens interpersonal relationships, reduces negative mindsets, improves thinking patterns, combats emotional dysfunctions and helps regulating emotion. It was suggested that the acceptance of the situation one is in, is the most important mechanism leading to these effects.

Research on dispositional mindfulness in sports is scarce. Gooding and Gardner (2008) questioned dispositional mindfulness for seventeen NCAA Division I men's basketball teams and investigated the influence on basketball free throw shooting percentage. They found that mindfulness predicts game free throw percentage and conclude that mindfulness contributes to competitive free throw percentage.

Mindfulness practice in sport

Kabat-Zinn et al. (1985) reported the first mindfulness training in a sport context in literature. He trained mindfulness meditation to collegiate and Olympic level rowers. It was reported that several medal-achieving Olympic athletes stated mindfulness training helped them perform their full potential and that collegiate rowers exceeded the expectations of their coach based on their abilities and experience. After this research, a silence of almost 20 years arose in sport psychology. Recently, two mindfulness-based interventions in sport were developed: Mindfulness-Acceptance-Commitment Approach (MAC; Gardner & Moore, 2007) and Mindful Sports Performance Enhancement (MPSE; Kaufman, Glass, & Arnkoff, 2009).

The MAC approach was designed for performance populations and can be used with athletes. It consists of five components: psycho-education, mindfulness, values identification and commitment, acceptance, integration and practice and teaches to attain optimal performance states. Gardner and Moore (2004) presented two case studies of athletes who underwent a MAC intervention. After the intervention higher levels of enjoyment and athletic performance were reported. Acceptance of negative thoughts, reduced worrying, increased enjoyment, concentration and persistence were also mentioned. Lutkenhouse and colleagues compared MAC to traditional performance skills training (Lutkenhouse et al., 2007). They found that coaches rated the performance of the collegiate athletes in the MAC group better than the athletes in the PST group.

MPSE teaches how to use mindfulness skills in sports by repeated practice and discussion of mindfulness exercises (Kaufman, Glass, & Arnkoff, 2009). Thompson and colleagues used the MPSE with 25 archers, golfers, and long-distance runners and found that participants reported an increase in overall trait mindfulness and the mindfulness subscale *act with awareness*. Significant decreases in task-irrelevant thoughts and task-related worries

were also reported (Thompson, Kaufman, De Petrillo, Glass, Arnkoff; 2011).

Thoughts suppression and ironic processes

Research has shown that attempts to control cognitive activity lead to more self-focused rather than task-focused attention and this may result in decreased performance (Gardner & Moore, 2007). Thought suppression can also produce paradoxical effects and actually increase the occurrence and frequency of unwanted thoughts and emotions (Wegner, Schneider, Carter, & White, 1987). An explanation for this can be found in a meta-cognitive scanning process that searches for signs of unwanted instruction and brings it to awareness when detected. These ironic processes impair performance in sport (Binsch, Oudjeans, Bakker & Savelsbergh, 2009; Woodman & Davis, 2008). The ironic process theory has important implications in sport psychology because traditional performance enhancement techniques try to control and change unwanted thoughts (Gardner & Moore, 2004). In contrast to controlling cognitive activity and suppressing thoughts, mindfulness considers thoughts as events that naturally come and go. Accepting thoughts without judgement and living in full awareness could have a positive effect on athlete's performance (Aherne & Morgan, 2011).

Conclusion

Many conceptualizations of mindfulness have been proposed throughout the past years and distinctions have been made based on broadness of mindfulness as well as between dispositional mindfulness and mindfulness practice. In this research, we will mainly work with Baer and colleagues' conceptualization that distinguishes four dimensions: *(1) observing internal and external stimuli, (2) describing and labelling phenomena non-judgementally, (3) acting with awareness and undivided attention and (4) accepting events or experiences without judging them.* Dispositional mindfulness showed to be positively associated to various

adaptive constructs such as performance (Gooding, & Gardner, 2008) and negatively associated to various maladaptive constructs. Research on dispositional mindfulness with sport samples is however scarce. More research has been done on mindfulness practice and promising results have been shown. Various positive outcomes were observed in experimental studies where participants underwent mindfulness training such as increased enjoyment and performance (Gardner, & Moore, 2004) and decreased task-irrelevant thoughts and task-related worries (Thompson, & al., 2011). Thought suppression and ironic processes might be important in explaining the positive effects of mindfulness. In mindfulness, thoughts should not be controlled and changed and are therefore not brought to awareness. Rather, they are accepted without judgement and lived in full awareness. Self-regulation of attention is an essential mental skill that facilitates performance (Kee & Wang, 2008). It is the first component of mindfulness proposed by Bishop and colleagues (2004) but is also presented as a mental skill that facilitates flow (e.g. Gardner, & Moore, 2006).

Flow

Csikszentmihalyi (1975) developed pioneering research with the purpose to understanding what makes an activity enjoyable. He explored activities such as rock climbing, dance, chess, and basketball that are expected to have intrinsic incentives and not relying on material rewards, and also occupations, such as music composers, surgeons, and teachers. The research concluded that flow was the crucial component of enjoyment and a model with different dimensions was developed.

Conceptualization

Csikszentmihalyi defined flow as “the state in which people are so involved in an activity that nothing else seems to matter; the experience itself is so enjoyable that people will

do it even at great cost, for the sheer sake of doing it” (1991, p. 40). It is a mindset that occurs when someone feels a balance between the demands of a task and his or her capacities (Csikszentmihalyi, 1990). In his work, Csikszentmihalyi distinguished enjoyment with pleasure. The latter is more concerned with homeostatic states whereas the former more with psychological growth. A climber can be in a situation where he finds himself in a dangerous situation, feels freezing and exhausted, yet he wouldn’t want to be anywhere else (Csikszentmihalyi, 1990).

Csikszentmihalyi (1990) identified nine dimensions of flow: (1) *challenge-skill balance*: sense that challenge is corresponding to skill, (2) *action-awareness merging*: deep involvement so that action feels spontaneous and almost automatic, (3) *clear goals*: certainty about what someone is going to do, (4) *unambiguous feedback*: clear and immediate feedback on actions, (5) *concentration on task*: concentration on the task that one is doing in the present moment, (6) *sense of control*: sense that someone knows how to respond to what will happen next and can deal with the situation, (7) *loss of self-consciousness*: loss of worry or concert about oneself as social actor, (8) *time transformation*: sense of time is distorted, and (9) *autotelic experience*: experience that the activity is intrinsically rewarding. Csikszentmihalyi (1991, p. 71) summarizes the elements of flow as

“a sense that one’s skills are adequate to cope with the challenges at hand in a goal directed, rule bound action system that provides clear clues as to how one is performing. Concentration is so intense that there is no attention left over to think about anything irrelevant or to worry about problems. Self-consciousness disappears, and the sense of time becomes distorted. An activity that produces such experiences is so gratifying that people are willing to do it for its own sake, with little concern for what they will get out of it, even when it is difficult or dangerous.”

Furthermore, Csikszentmihalyi (1975) describes six features of phenomenological experience of flow that are an integral part of the nine dimensions of flow. First, flow is described as the merging of action and awareness. As soon as awareness becomes split and one reflects on the act of awareness, flow gets interrupted. An expert rock climber said “You are so involved in what you are doing [that] you aren’t thinking of yourself as separate from the immediate activity ...you don’t see yourself as separate from what you are doing” (Csikszentmihalyi, 1975, p. 59). A second factor makes the merging of action and awareness possible: centering of attention on a limited stimulus field. Loss of ego, self-forgetfulness and loss of self-consciousness are used to describe the third factor. By this, it is not meant that one experiences a loss of self, but only a loss of consciousness of the self. Perception of control over actions and on environment is the fourth factor. The next quality of flow is that it often arises in situations with coherent demands and clear feedback as limited possibilities can help direct the awareness. The sixth and last feature of flow is described as “autotelic”. This means that there appear no goals or rewards external to itself. Csikszentmihalyi (1975) does note that most things we do are a combination of autotelic and exotelic (done for external reasons).

Originally, flow was defined as a state (Csikszentmihalyi, 1990) but later it was also measured and conceptualized as a domain-specific trait (tendency to experience flow in specific activities and contexts) and as a broad trait (tendency to frequently experience flow across a wide range of situations) (Jackson & Eklund, 2002).

Flow research

Flow has been associated with greater intrinsic satisfaction, centering of attention, perceptions of control over actions and environment, lower self-consciousness, losing track of time and merging of actions and awareness (Csikszentmihalyi, 1990; Stein, Kimiecik, Daniels, & Jackson, 1995).

Kee and Wang (2008) investigated the relationship between flow, mindfulness and mental skills using a cluster analysis concluding that athletes who scored higher on dispositional mindfulness, report higher overall flow scores. They found significantly higher scores on the *subscales clear goals, concentration, sense of control, loss of self-consciousness* and *challenge-skill balance* of the dispositional flow scale (FS-2, Jackson & Eklund, 2004). *Challenge-skill balance* is considered a key flow disposition (Jackson & Csikszentmihalyi, 1999). The higher scores on the other four subscales can be explained by the self-regulative component of the mindfulness conceptualization by Bishop et al. (2004). First, mindfulness and higher self-regulation of attention may lead to better insight in goals and thus higher scores on the subscale *clear goals* (Kee & Wang, 2008). Second, the *concentration* subscale of flow focuses on the task that one is doing in the present moment and this present moment is very important in mindfulness (Kee & Wang, 2008). Mindfulness is related to self-regulation of attention and this explains the higher *sense of control* for mindful athletes (Bishop et al., 2004). It is possible that the *loss of self-consciousness* results from the purposelessness of mindfulness or from the more positive self-esteem (Ryan & Brown, 2003). Another finding by Kee and Wang (2008) is that mindful people use more attentional control, emotional control, goal setting, and self-talk. The reason for using more of these mental skills might be found in the heightened sense of self-awareness of mindful people (Kee & Wang, 2008). Earlier research already showed that mindfulness can promote coping strategies through improvements in self-observation and this detection of threats and emotional events can help to apply the learned coping strategies (Baer, 2003). A weakness of Kee and Wang's study (2008) is the cross-sectional design. However, based on their findings, it cannot be concluded that mindfulness caused flow as this design does not show causality effects.

Aherne and Moran (2011) used an experimental set-up where participants underwent a mindfulness training to see the influence on their flow experiences. They found that

participants who underwent the mindfulness training reported an overall increase of flow as well as a significant result on the subscales *clear goals* and *sense of control*. These results are consistent with Kee and Wang's results in the aforementioned study. However Aherne and Moran (2011) did not find a significant effect on the subscales *challenge-skill balance*, *concentration* and loss of *self-consciousness*. A possible explanation for this discrepancy can be found in the use of a dispositional measure of flow by Kee and Wang (2008) and a situation-specific scale by Moran (2011). These instruments are complementary but not equivalent (Jackson & Kimiecik, 2008). Another explanation might be found in the small sample size and possibility of Type II error in Aherne and Morgan's study (2011). Although no significant changes were found for *challenge-skill balance*, *concentration* and loss of *self-consciousness*, examination of the effect sizes showed suggests that increases may have occurred ($d = .6 - 1.6$).

Further experimental research have supported that mindfulness interventions such as Mindful sport performance enhancement (MSPE) and mindfulness-acceptance-commitment (MAC) have a positive effect on overall flow experiences (De Petrillo, Kaufman, Glass, & Ankoff, 2009; Kaufman et al., 2009; Lutkenhouse, Gardner, & Moore, 2010; Schwanhausser, 2009). In their recent article, Thompson and colleagues (2011) investigated the effect of MSPE on overall flow with archers, golfers and runners in a one-year follow up study with athletes who participated in either Kaufman et al.'s (2009) or De Petrillo et al.'s (2009) studies. Contrary to the original studies, no improvement in flow was observed one year later. The results also show that most of the participants practiced mindfulness only sporadically which might explain this finding.

Conclusion

Flow is the state in which people are so involved in an activity that nothing else seems to matter; the experience itself is so enjoyable that people will do it even at great cost, for the sheer sake of doing it” (Csikszentmihalyi, 1991, p. 40). In his flow theory, Csikszentmihalyi (1990) states that a balance between demands of a task and capacities of a person is essential for flow. Higher intrinsic satisfaction, centering of attention, perceptions of control over actions and environment, lower self-consciousness, losing track of time and merging of actions and awareness are associated to flow (Csikszentmihalyi, 1990; Stein, Kimiecik, Daniels, & Jackson, 1995). Furthermore, research in sports indicates that higher mindfulness might lead to higher flow experiences.

Enjoyment

Enjoyment is a construct that has been discussed throughout many domains in sport psychology. First and foremost, it is a central component in many motivational sport theories such as competence motivation theory (Harter, 1978), sport commitment model (Scanlan et al., 1993) and achievement goal theory (Nicholls, 1989). In flow theory, enjoyment is also discussed as Csikszentmihalyi believed that flow is a crucial opponent of enjoyment (1975). Furthermore enjoyment is believed to be associated with mindfulness (Langer, Blank, Chanowitz, 1978).

Conceptualization

Although enjoyment is a key construct in explaining motivation and experiences of sport, there is a lack of a conceptual and operational definition (Kimiecik & Harris, 1996). Wankel (1993, p.155) defines enjoyment as “A positive emotion, a positive affect state. It may be homeostatic in nature, resulting from a satiation of biological needs, or growth

oriented, involving a cognitive dimension focusing on the perception of successfully applying one's skills to meet environmental challenges". The first part of this definition is based on the idea of enjoyment as a positive affective response whereas the second part has similarities with Csikzentmihalyi's earlier mentioned definition of flow. Kimiecik and Harris proposed to focus on the second part of Wankels's definition and define enjoyment as "an optimal psychological experience that leads to pursuing an activity for its own sake and associated with positive affective experiences" (1996, p. 259).

Although Csikzentmihalyi's research on enjoyment eventually lead to the development of the concept of flow, research shows that enjoyment and flow are not two names for the same construct (Clarke, & Haworth, 1994). Clarke and Haworth (1994) used a student sample to investigate enjoyment and flow. They compared participants in a flow-group who rated both challenge and skill as high to a control group who rated challenge as low and skill as high. As expected by the flow-model assumptions, they found that when students with high skills were matched to high challenges, enjoyment was high. On the other hand and not in line with the expectations, participants of the control group reported higher enjoyment than the flow group. Haworth and Evans (1995) found different results in their research on flow and enjoyment. They found that when enjoyment and skill both were high, enjoyment peaked as predicted by the flow-model. However, these findings also showed that a big part (50-60%) of the flow situations were not experienced as enjoyable by the participants. The difference in results between both studies might be explained by cultural differences (Haworth, 1997). The college students in Clark and Haworth (1995) might be characterized as high achievers which would explain their preference for high skill situations whereas the British Job Training Scheme students in Haworth and Evans (1995) would be more oriented to avoid non-stimulation. Apart from this difference, the two studies agree that although there is an association, enjoyment and flow can certainly not be seen as

synonymous. Furthermore, it was found that the enjoyable flow group experienced more happiness, relaxation, and interest, and scored better on other well-being questionnaires than the not enjoyable flow group (Clark, & Haworth, 1994).

In Vallerand's model of motivation, based on self-determination theory (SDT), enjoyment is one of the consequences of the different types of motivation (Vallerand, 1997). SDT is widely used to explain motivation (Deci, 1975; Deci & Ryan, 1985, 1990) and argues that people can be amotivated, extrinsically motivated or intrinsically motivated towards activities (Deci, & Ryan, 1991). When one is intrinsically motivated, he or she does the activity for its own sake, learn or develop competences or for enjoyment. Extrinsically motivated people on the other hand, do activities to achieve certain desirable outcomes (Deci, 1975; Deci & Ryan, 1985, 1990).

Enjoyment research

Wankel (1993) showed that enjoyment is essential in the process of getting psychological benefits and positive affective states from exercise. Enjoyment is also an important predictor and outcome of physical activity (Williams, Papandonatos, Napolitano, Lewis, & Whiteley, 2006). It was for example found to be the only consistent predictor of physical activity levels for children in grades 4-12 (Sallis, Prochaska, Taylor, Hill, & Geraci, 1999). Other research has shown that enjoyment was related with increases in positive affect, but not related with changes in negative effect (Raedeke, 2007) and that enjoyment in rock climbing is a mediator for the positive effects on mood (Motl, Berger, & Leuschen, 2000). Other associations were found with self-efficacy, goal setting (Rovniak, Anderson, Winett, & Stephens, 2002), task orientation (Boyd & Yin, 1996; Newton & Duda, 1993) and perceived competence (Boyd & Yin, 1996).

Wankel and Kreisel (1985) questioned male team sport participants on enjoyment in sports. They found, in line with SDT, that intrinsic factors (sport, personal accomplishments and improving one's skills) were rated most important for enjoyment. Social factors (e.g., being with friends) were rated less important, while extrinsic factors (e.g., winning the game and pleasing others) were rated as least important.

Gardner and Moore (2004) describe two case studies in their article on Mindfulness-Acceptance-Commitment (MAC). Both athletes underwent the MAC protocol to enhance engagement in practice, competitive performance and enjoyment. Both cases reported increased enjoyment after the intervention.

Conclusion

Enjoyment is an important construct in sport psychology that comes back in many theories. Besides the self-determination theory (Deci, 1975; Deci & Ryan, 1985, 1990), it is also associated with mindfulness (Langer, Blank, Chanowitz, 1978) and an important part of flow theory (Csikszentmihalyi, 1975). Kimiecik and Harris define enjoyment as “an optimal psychological experience that leads to pursuing an activity for its own sake and associated with positive affective experiences” (1996, p. 259). Although this definition shows conceptual similarities to flow, research shows that enjoyment and flow are not synonymous (Clarke, & Haworth, 1994; Haworth & Evans, 1995). Research also shows various positive associations with enjoyment. It is for example associated to physical activity (Williams, Papandonatos, Napolitano, Lewis, & Whiteley, 2006), positive affective states resulting from exercise (Wankel, 1993), self-efficacy and goal setting (Rovniak, Anderson, Winett, & Stephens, 2002). Furthermore athletes' enjoyment might benefit from a mindfulness intervention.

Linking mindfulness, flow and enjoyment

In order to investigate the link between mindfulness, flow and enjoyment, two hypotheses were made. Firstly, based on the theoretical overlap and research we expected to find high positive association between the three variables mindfulness, flow and enjoyment. Secondly, we hypothesized that flow mediates the effect of mindfulness on enjoyment. In order to justify this hypothesis, three relationships need to be discussed. *(a) mindfulness as an antecedent of flow, (b) flow as an antecedent of enjoyment, (c) mindfulness as an antecedent of enjoyment.*

(a) Mindfulness as an antecedent of flow

Jackson (1995) interviewed elite athletes about the factors that influence their flow experience. Concentration was named to be an important facilitator while thinking too much, being over-concerned with what others were thinking, worrying about other competitors and worrying about what others were thinking about oneself had a negative influence on flow experiences. Mindfulness is believed to have an influence on these factors. Research also shows that mindfulness and flow are both associated with feelings of calmness, serenity and mind-body unity (Gardner & Moore, 2004; Kaufman et al., 2009). As mentioned before, earlier findings also indicated that mindfulness has a positive influence on flow (Kee and Wang, 2008; Aherne and Moran, 2011); Kaufman et al., 2009; Thompson et al., 2011.

(b) Flow as an antecedent of enjoyment

As aforementioned, flow is used to explain enjoyment derived from in activities and understand the motives to engage in them (Weber, Tamborini, Westcott-Baker, & Kantor, 2009). Furthermore, it is believed in the flow theory (Csikszentmihalyi, 1975) that flow is a crucial component of enjoyment. Based on this theoretical background we propose flow as an

antecedent of enjoyment.

(c) Mindfulness as an antecedent of enjoyment.

According to the self-determination theory (SDT), it is important to perceive autonomy to act intrinsically and therefore perceive higher levels of enjoyment (SDT; Deci, 1975; Deci & Ryan, 1985, 1990). To act with autonomy, one needs to consider goals and activities to choose or reject. Mindful people are more aware of what is happening and can therefore take these decisions in a better and more integrated way. (Ryan, Huta, & Deci, 2006). Brown and Ryan (2003) showed an association between mindfulness and autonomous self-regulation and more recently studies showed that people who are more mindful are less materialistic and embrace more intrinsic values (Brown, & Ryan, 2004). It is likely that mindfulness leads to intrinsic behaviour and enjoyment by creating awareness of what to do and how to do it well (Ryan, Huta, & Deci, 2006).

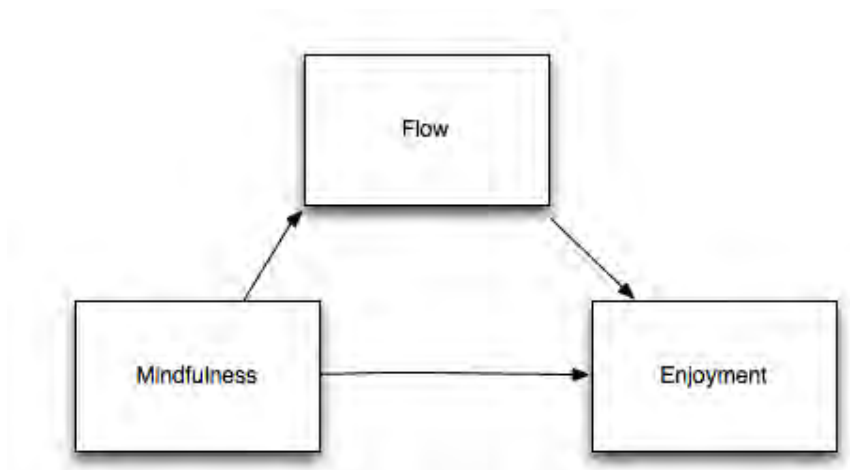


Figure 1: The hypothesized mediation effect

METHOD

Participants

The sample consisted of 294 participants (131 female, 163 male) with an average age of 25.60 (± 3.95) and range 18-40 years. All participants engage in sports and the average training volume reported was 5.50 (± 6.47) hours per week. Most reported participating in sports at a recreational level (70.07%), whereas the rest (29.93%) reported participating competitively.

Procedure

Ethical clearance was provided by University of Thessaly. An online questionnaire with the measures of mindfulness, flow and enjoyment was spread and participants were mainly recruited through the use of social media. Three 20-euro Amazon vouchers were raffled among the participants. Participants were given a short explanation of the study and informed that participation was voluntary and anonymous. Consent was given by completing the questionnaire.

Measures

Mindfulness. KIMS-Short (Höfling, Ströhle, & Michalak, 2011) is based on the Kentucky Inventory of Mindfulness Skills (KIMS; Baer, Smith, & Allen, 2004). It was reduced to 20 items on a 1 to 5 scale. Five dimensions were found as the four dimensions of the original KIMS were replicated and the dimension “observing internal & observing external stimuli” was split up into two different dimensions: (1) *observation of internal stimuli*: 3 items (e.g. When I’m walking, I deliberately notice the sensations of my body moving) and (2) *observing external stimuli*: 3 items (e.g. I notice the smells and aromas of things). Further scales are (3) *describing and labelling phenomena non-judgmentally*: 5 items

(e.g. I'm good at finding the words to describe my feelings), (4) *acting with awareness and undivided attention*: 4 items (e.g. When I'm doing something, I'm only focused on what I'm doing, nothing else), and (5) accepting events or experiences without judging them: 5 items (e.g. I criticize myself for having irrational or inappropriate emotions).

Flow. To measure flow, the Flow-Kurzfragenboog (FKS; Rheinberg, Vollmeyer, & Engenser, 2003) was used. The FKS is based on Csikszentmihalyi's (1990) conceptualization of Flow and consists of 10 questions. Two components can be distinguished in the FKS: *automaticity-in-action* (glatter autmatischer Verlauf) and *being-absorbed-by-action* (absorbiertheit). The first scale, *automaticity-in-action* consists of 6 items measuring the flow process that seems to run automatically and on itself without effort (e.g., "I feel that everything is under control"). It measures involvement, distorted sense of time, optimal challenge and absent-mindedness. The second scale, *being-absorbed-by-action*, consists of 4 items measuring how absorbed someone becomes through the activity (e.g., "I do not recognise that time is going by"). It measures concentration and focus, control, clarity and smooth and automatic thought. The original questions were adapted to a sport context by starting the questions with "when I do sports, ..." so flow was measured as a domain-specific trait, the tendency to experience flow in sports.

Enjoyment. The German Version of Physical Activity Enjoyment Scale (PACES; Jedauc et al, 2012) which is based on the original PACES by Kendzierski and Decarlo (1991) was used to assess enjoyment. The scale consists of 16 items (e.g. I find moving boring, e.g. I don't like moving) on a 5-point scale from 1 (not at all) to 5 (extremely).

Statistical Analysis

All variables were checked for normality and outliers but none were found. Pearson product-moment correlations were computed tested between mindfulness, flow and enjoyment.

Differences in sport involvement level between recreational and competitive athletes are investigated using two one-way MANOVA's for mindfulness and flow and an ANOVA for enjoyment.

The mediation hypotheses were examined in two phases. In the first phase, we used the method of Barron and Kenny (1986). This model states that a mediation leads to a decreased relationship between the independent (X) and dependant (Y) when controlled for the mediating variable (M). Firstly the relationship between mindfulness (X) and enjoyment (Y) and secondly the relationship between mindfulness (X) and flow(M) are investigated. The data for the first two steps is available in the correlation analysis. Next, two multiple regression analyses are used for the third and fourth step of the model. The third step of the model is to investigate the relationship between flow (M) and enjoyment (Y), controlling for mindfulness (X). Finally, the relationship between mindfulness and enjoyment, controlling for flow (M) is investigated. When the mediation is found, the analyses move into a second phase. In the second phase, the mediation paths are investigated using the Sobel test (Hayes, n.d. ; Preacher & Hayes, 2004, 2008). This test examines the amount of mediation in terms of reduction of the direct effect of the independent variable (IV) on the dependant variable (DV).

RESULTS

Preliminary analyses

Table 1 depicts the descriptive statistics and Cronbach's alpha for all variables. Overall, the Cronbach's alpha coefficients (ranging from .65 to .89) provided support for the reliability of the measures. The coefficients for observing external stimuli, observing internal stimuli, and being absorbed by action were below the .70 threshold, but still at acceptable levels. Examination of the means showed that participants scored moderately on mindfulness, moderately high on flow, and high on enjoyment.

Table 1. Descriptive statistics and reliability for all variables.

	Mean	SD	Cronbach's α
KIMS	3.39	.39	.72
Observing internal stimuli	3.32	.81	.65
Observing external stimuli	3.59	.75	.68
Describing and labelling non-judgementally	3.60	.71	.82
Acting with awareness and undivided attention	2.87	.68	.75
Accepting without judging	3.51	.75	.79
FKS	5.25	.82	.85
Automaticity-in-action	5.27	.88	.79
Being-absorbed-by-action	5.21	.92	.69
PACES	4.46	.44	.89

Correlation analysis revealed positive correlations between flow and overall mindfulness, as well as on three out of five mindfulness subscales; *observing internal stimuli, acting with awareness and undivided attention, and describing and labelling non-*

judgementally. Accepting without judging was not found to be associated significantly to flow but did have a significant correlation with flow subscale *automaticity-in-action*. *Observing external stimuli* was not found to have a significant relationship. We also found, as expected, that enjoyment was related to overall mindfulness, and in addition, to three out of five mindfulness subscales; *observing internal stimuli, describing and labelling non-judgementally, accepting without judgement*. Enjoyment was not found to predict *observing of external stimuli* and *acting with awareness and undivided attention*. Finally, the zero-order correlations showed us a strong positive relationship between enjoyment and flow. The correlations for the total sample are presented in Table 2.

Differences between recreational and competitive athletes

Differences in means

One-way MANOVA was calculated to test for differences in the dimensions of mindfulness as a function of sport involvement level. The analysis revealed a significant multivariate effect, $F(5, 288) = 2.29, p < .05, \eta^2 = .016$. Examination of the univariate effects showed significant effects for observing external stimuli, $F(1, 293) = 5.53, p < .05, \eta^2 = .019$, and acting with awareness and undivided attention, $F(1, 293) = 7.85, p < .01, \eta^2 = .005$. Examination of the mean scores showed that recreational athletes scored higher than competitive athletes for observing external stimuli, whereas competitive athletes scored higher than recreational athletes for acting with awareness and undivided attention. The mean scores for all variables as a function of involvement level are presented in Table 3.

To examine the differences in the dimensions of flow as a function of sport involvement level, a second one-way MANOVA was calculated. A significant multivariate effect was found, $F(3, 290) = 4.71, p < .05, \eta^2 = .01$.

Table 2: Correlations between all variables.

	1	2	3	4	5	6	7	8	9	10
1. KIMS	1	.50 **	.41 **	.66 **	.40 **	.58 **	.27 **	.29 **	.18 **	.20 **
2. Observing internal stimuli		1	.50 **	.12 *	.10	-.09	.13 *	.12	.12 *	.11
3. Observing external stimuli			1	.06	-.03	-.11	.02	-.00	.05	.08
4. Describing and labelling non-judgementally				1	.02	.29 **	.13 *	.19 **	.03	.14 *
5. Acting with awareness and undivided attention					1	.05	.32 **	.30 **	.27 **	.04
6. Accepting without judging						1	.10	.13 *	.04	.13 *
7. Flow							1	.94 **	.87 **	.47 **
8. Automaticity-in-action								1	.66 **	.41 **
9. Being-absorbed-by-action									1	.45 **
10. Enjoyment										1

* p<.05, ** p<.01

Furthermore, the univariate results show significant effects for overall flow $F(1, 293) = 9.38$, $p < .01$, $\eta^2 = .002$, automaticity-in-action, $F(1, 292) = 7.82$, $p < .01$, $\eta^2 = .006$, and being-absorbed-by-action, $F(1, 293) = 7.76$, $p < .01$, $\eta^2 = .006$. The mean scores show us that competitive athletes score higher on overall flow, automaticity-in-action and being-absorbed-by-action than recreational athletes. Table 3 displays the mean scores of all variables as a function of involvement level.

Finally, the difference of enjoyment as a function of sport involvement level was investigated using an ANOVA-analysis. A significant effect is found for enjoyment, $F(1, 293) = 11.89$, $p < .01$, $\eta^2 = .001$ and the mean scores show us that competitive athletes report higher enjoyment than recreational athletes. Table 3 shows the mean scores of enjoyment as a function of sport involvement level.

Table 3: Differences in mindfulness, flow, and enjoyment as a function of sport level

Scales	Recreational		Competitive		Sign
	Mean	SD	Mean	SD	
KIMS	3.38	.40	3.41	.35	.511
Observing internal stimuli	3.37	.78	3.25	.83	.228
Observing external stimuli	3.65	.74	3.43	.74	.019 *
Describing and labelling non-judgementally	3.58	.73	3.65	.65	.430
Acting with awareness and undivided attention	2.79	.65	3.02	.64	.005 **
Accepting without judging	3.48	.81	3.56	.58	.412
Flow	5.15	.82	5.46	.76	.002 **
Automaticity-in-action	5.17	.88	5.48	.84	.006 **
Being-absorbed-by-action	5.12	.94	5.43	.79	.006 **
Enjoyment	4.41	.46	4.60	.35	.001 **

* $p < .05$, ** $p < .01$

Differences in correlations

Because differences were found between competitive and recreational samples correlations for the variables of interest were calculated separately for the two samples in order to explore potentially different correlation patterns. These correlations are presented in Table 4. We see similar correlations for recreational and competitive athletes on the three overall variables. A moderately positive relationship was found between mindfulness and flow as well as a strong positive relationship between flow and enjoyment. The moderate positive correlation found between mindfulness and enjoyment is the same for both groups. The .19 correlation found, is significant for recreational athletes and insignificant for competitive athletes, which can be explained by the smaller sample size of competitive athletes. Because these correlations were similar for the two samples, regression analyses were calculated for the total sample.

Despite the similar findings for the overall variables, differences were found on subscale level. The relationship between flow and *observing internal stimuli* and *describing and labeling non-judgmentally* and *accepting without judging* is stronger for recreational athletes. On the other hand, the relationship between flow and *observing internal stimuli* and *acting with awareness and undivided attention* is stronger for competitive athletes. The association between enjoyment and *acting with awareness and undivided attention* is stronger for recreational athletes whereas the relationship between enjoyment and *describing and labeling non-judgmentally* is stronger for competitive athletes.

Table 4: Correlations for recreational and competitive athletes.

		Recreational athletes									
		1	2	3	4	5	6	7	8	9	10
Competitive athletes	1. KIMS	-	.48 **	.35 **	.68 **	.39 **	.62 **	.26 **	.30 **	.15 *	.19 **
	2. Observing internal stimuli	.58 **	-	.50 **	.12	.11	-.09	.18 **	.19 **	.13	.15 *
	3. Observing external stimuli	.59 **	.50 **	-	-.01	-.05	-.11	-.01	-.03	.02	.05
	4. Describing and labelling non-judgementally	.62 **	.12	.24 *	-	.04	.33 **	.16 *	.34 **	.01	.11
	5. Acting with awareness and undivided attention	.43 **	.14	.07	-.04	-	.05	.22 **	.19 **	.21 **	.05
	6. Accepting without judging	.42 **	-.08	-.09	.12	.03	-	.12	.15 *	.06	.13
	7. Flow	.28 **	.05	.20	.04	.49 **	.02	-	.93 **	.87 **	.46 **
	8. Automaticity-in-action	.26 *	.00	.14	.03	.51 **	.046	.96 **	-	.63 **	.41 **
	9. Being-absorbed-by-action	.26 *	.13	.25 *	.04	.37 **	-.03	.89 **	.71 **	-	.42 **
	10. Enjoyment	.19	.05	.30 **	.23	-.15	.08	.45 **	.36 **	.50 **	-

* p<.05, ** p<.01

Mediation hypothesis

The mediation hypothesis was examined through regression analyses following the recommendation of Baron and Kenny (1996). Considering the purpose of the analysis and based on previous literature total scores were computed for flow (Stoll & Lau, 2005) and mindfulness (Thompson et al., 2011). First the relationship between mindfulness and enjoyment is investigated. We see in table 2 that the correlation between these two variables is .20. Next, we look into the relationship between mindfulness and flow. Table 2 also shows us that this is .27. Having established, through the correlation analysis, the relationships between the independent variable, enjoyment, the mediator, flow, and the dependent variable, mindfulness, two hierarchical regression analysis were calculated to further test the mediation hypothesis. In the first model, flow was entered the regression at the first step and enjoyment at the second. The results showed that flow was a significant predictor of mindfulness both at the first step, ($\beta = .30$, $t = 5.45$, $p < .01$), and at the second when enjoyment was entered in the regression, ($\beta = .23$, $t = 3.93$, $p < .01$). In the second model, enjoyment entered the regression at the first step and flow at the second. The results showed that at the first step enjoyment was a significant predictor of mindfulness, ($\beta = .23$, $t = 4.09$, $p < .01$), however, at the second step, when flow was entered, the relationship between enjoyment and mindfulness beliefs became not significant ($\beta = .09$, $t = 1.40$, $p = .16$). Taken together the results from the two regression models provide support for the meditational effect of flow in the relationship between enjoyment and mindfulness.

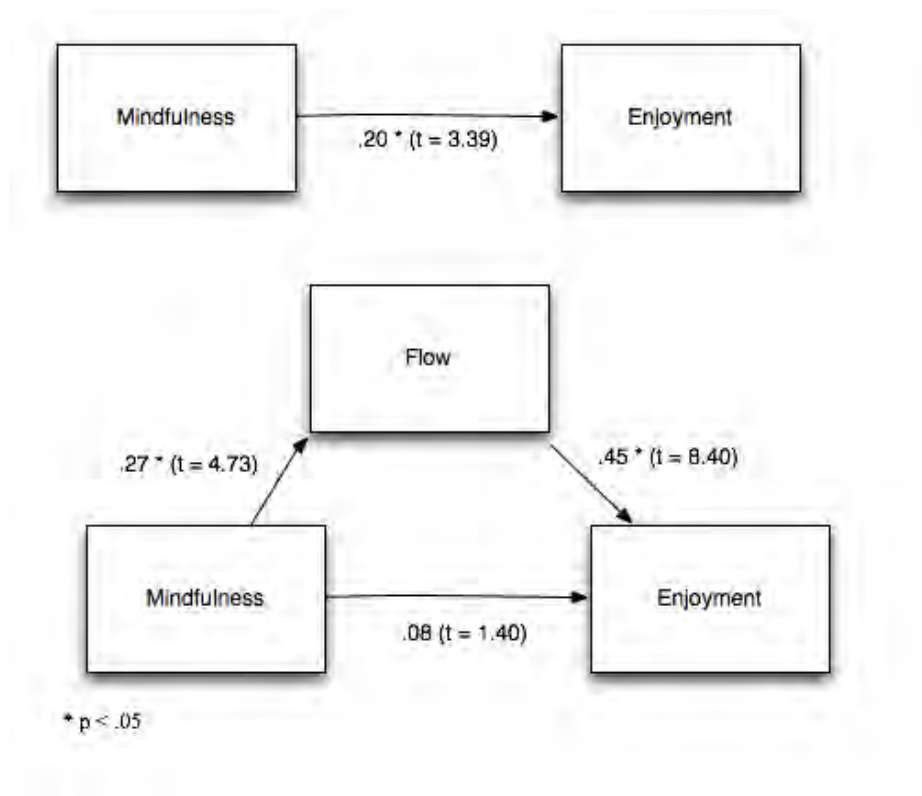


Figure 2: The mediational role of flow in the mindfulness - enjoyment relationship

Figure 2 shows the estimated path coefficients for the mediation of flow on the relationship between mindfulness and flow. The total effect of mindfulness on enjoyment is compared to the direct effect of mindfulness on enjoyment when the mediator, flow, is controlled for. The direct effect was smaller than the total effect and did not remain significant. Flow acted as a partial mediator in the relationship between mindfulness and enjoyment (Sobel, $t_a = 4.73$, $t_b = 8.40$, $z = 4.12$, $p < 0.01$). Therefore hypothesis 2 is supported.

DISCUSSION

Emperical evidence showed that mindfulness is a performance-relevant trait in sports (Birrer, Röthlin, & Morgen, 2012). Theoretical overlap is found between mindfulness, flow and enjoyment. Bishop (2004) proposed two dimensions of mindfulness: *(1) self-regulation of attention in the present moment* and *(2) the attitude of openness, willingness, and awareness of experience in the present moment*. Self-regulation of attention is often seen as the central component of mindfulness (Bishop et al., 2004). In Csikszentmihalyi's flow theory, the allocation of attentional resources is also a central component. Attention is "the medium that makes information appear in consciousness" (Csikszentmihalyi, 1988, p. 17). The intense focus and concentration that characterises flow even inspired researchers to use meditation for studying flow (Massimini, Csikszentmihalyi, & Delle Fave, 1988; Newberg & Iversen, 2003). Hence, attentional control is the common factor between the mindfulness and flow (Kee, & Wang, 2008). Research also showed the importance of attention for the third variable researched; enjoyment. Hamilton (1994) showed that both boredom coping and intrinsic motivation were characterized by attentional control. Although the theoretical background argues that mindfulness, flow and enjoyment a lot in common, it does not specify the exact relationship between these concepts. This study examines the relationship between mindfulness, flow and enjoyment in sports by measuring dispositional mindfulness and sport-specific flow and enjoyment with athletes. It was expected to find positive associations between the three constructs. It was also hypothesized that flow mediates the relationship between enjoyment and mindfulness.

Support was found for the hypothesized positive correlation between mindfulness, flow and enjoyment. The data show that people who are dispositionally more mindful, also report higher flow scores in sport and report more enjoyment in sport. Flow and its subscales

load highest on the mindfulness subscale *acting with awareness and undivided attention*.

This is in line with previous research done by Thompson and colleagues (2011) who found that the mindful sport performance enhancement (MSPE) had a positive impact on overall mindfulness and *acting with awareness and undivided attention*. The relationship between mindfulness and flow might be based mainly on how much the athletes focus on the task at hand. Previous research showed the importance of mindfulness in concentration (Aherne, Moran, & Lonsdale, 2011) and concentration is also an essential for flow (Jackson, 1995). It is possible that giving full attention to the activity one is in helps concentration, which in turn might lead to higher flow experiences. Furthermore, differences of mindfulness, flow and enjoyment were investigated as a function of sport involvement level. The findings were in line with the association between giving full attention to the activity one is in and flow. They show that competitive athletes report higher scores of flow, enjoyment and *acting with awareness and undivided attention*. Competitive athletes also scored higher on the mindfulness subscale *observing external stimuli* but the differences on the overall variables were small so further analyses were done with the full sample.

The second hypothesis proposed sport-specific flow as mediator between dispositional mindfulness and enjoyment. The hypothesis was supported as flow was found to act as a partial mediator in this relationship. First, the mediation model found shows that mindfulness predicts flow which is in line with previous research. Kee & Wang found that athletes reporting higher dispositional mindfulness also report higher flow scores. Furthermore mindfulness interventions have shown to have a positive impact on flow (Aherne, & Moran, 2011; Kaufman et al., 2009; Thompson et al., 2011). Second, the model also shows that flow predicts enjoyment. Jackson (1995) named concentration, thinking too much, being over-concerned with what others were thinking, worrying about other competitors and about what others were thinking had a negative influence on flow. These factors might help explain the

relationship between flow and mindfulness as mindfulness is believed to positively influence them. Furthermore, the model shows that flow predicts enjoyment. This finding offers support of the flow theory (Csikszentmihalyi, 1975) that describes flow as a crucial component of enjoyment. Flow explains why one enjoys activities as well as helps to understand the motives to engage in those activities. Finally the model shows that mindfulness predicts enjoyment. This supports the research indicating that enjoyment might benefit from mindfulness (Gardner and Moore, 2004). However, when flow is introduced as mediator, mindfulness no longer predicts enjoyment. Dispositional mindfulness appears to predict enjoyment in part by fostering sport-specific flow.

The findings of this study should be evaluated in the light of five limitations. The first limitation is that the measures used in this study are self-report measures. These measures are prone to biases that may cause non-random errors and distort the results. The second limitation is that all measures were questioned retrospectively. For flow and mindfulness it is however difficult to assess the present moment focus in sports without getting the athlete out of that present moment (Kee & Wang, 2007; Csikszentmihalyi, 1975). The third limitation is concerning the recruitment procedure and sample. The surveys were filled out online and participants were recruited mainly through social media. It is possible that had an influence on the composition of our sample. Furthermore there might have been an influence of the three 20-euro vouchers that were raffled. The heterogeneity of the sample can also be a limitation as differences between competitive and recreational athletes were found. However, these differences were investigated and similar correlations were found between both groups. Fourth, the cross-sectional means that we cannot draw causal conclusions. It is possible that mindfulness leads to enjoyment and is mediated by flow but on the other hand it is also possible that enjoyment leads to mindfulness and which is mediated by flow. Finally, KIMS and FKS have subscales but because of the relative small sample size and preliminary nature

of this study only the overall scores were used in the mediation analysis.

Future research should aim for experimental or longitudinal designs. That way causality of the relationship can be investigated. Mindfulness-Acceptance-Commitment Approach (MAC; Gardner & Moore, 2007) and Mindful Sports Performance Enhancement (MPSE; Kaufman, Glass, & Arnkoff, 2009) are two promising mindfulness-based interventions that can be used in experimental research. Furthermore, the influence of variables such as gender, sex and meditation experience should be examined to offer more insight on the relationship. Future research can also investigate more complex models of the mediation effect of flow on the relationship of mindfulness and enjoyment using more subscales.

Despite these limitations, the study offers a better understanding of how mindfulness influences athletes during physical activity. Mindfulness research is scarce in sports and therefore the current study fills a gap in literature and offers more knowledge about the relationship of mindfulness, flow and enjoyment in sport. It indicates that dispositional mindfulness predicts enjoyment in sport but that this relationship in part is mediated by situation-specific flow. In practice, this knowledge can help sport psychologists when delivering mental skills programs. Empirical evidence showed that mindfulness is a performance-relevant trait in sports (Birrer, Röthlin, & Morgen, 2012). It was also shown that mindfulness practice leads to higher levels of dispositional mindfulness (Carmody, Baer, Lykins, & Olendzki, 2009). This indicates that even though this study measured dispositional mindfulness, it provides preliminary indications for interventions showing that athletes who are dispositionally more mindful, experience more flow and enjoyment. Furthermore, Kee and Wang (2008) show that understanding individual differences in mindfulness can help to make better decisions (Kee, & Wang, 2008).

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Appendix

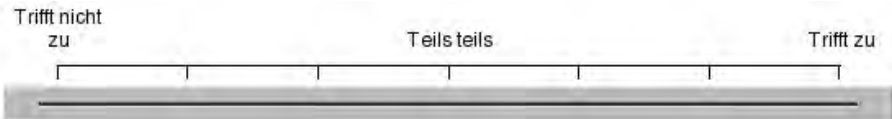
Wählen Sie die Antwortmöglichkeit aus, die im Allgemeinen in Ihrem Leben am besten/ehesten auf Sie zutrifft.

	Trifft nie oder sehr selten zu	Trifft selten zu	Trifft manchmal zu	Trifft oft zu	Trifft sehr oft oder immer zu
Ich kann meine Gefühle gut in Worte fassen.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ich kritisiere mich dafür, irrationale oder unangebrachte Gefühle zu haben.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ich konzentriere mich nur auf das, was ich gerade tue und auf nichts anderes.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wenn ich gehe, dann nehme ich ganz bewusst wahr, wie sich die Bewegungen meines Körpers anfühlen.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wenn ich dusche oder bade, bin ich mir des Gefühls des Wassers auf meinem Körper bewusst.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Es fällt mir schwer, dass was ich denke, in Worte zu fassen.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ich glaube, dass einige meiner Gedanken unnormal sind und dass ich nicht so denken sollte.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ich habe Schwierigkeiten, die richtigen Worte zu finden, um meine Gefühle auszudrücken.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wenn ich etwas tue, dann bin ich davon völlig eingenommen und denke an nichts anderes mehr.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ich urteile darüber, ob meine Gedanken gut oder schlecht sind.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ich achte auf meine Empfindungen, wie zum Beispiel Wind durch meine Haare oder Sonnenschein auf meinem Gesicht.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Körperliche Empfindungen sind für mich schwer zu beschreiben, weil mir die richtigen Worte dazu fehlen.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ich achte auf Geräusche, wie beispielsweise das Ticken von Uhren, Vogelzwitschern oder das Geräusch von vorbeifahrenden Autos.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sogar wenn ich schrecklich verärgert bin, kann ich das in Worte fassen.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ich sage mir, dass ich nicht so denken sollte, wie ich denke.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ich nehme Gerüche und Düfte der Dinge wahr.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ich neige dazu mehrere Dinge gleichzeitig zu tun, anstatt mich nur auf eine Sache zu konzentrieren.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ich denke, dass manche meiner Gefühle schlecht oder unangebracht sind und dass ich sie nicht haben sollte.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ich bemerke visuelle Elemente sowohl in der Kunst als auch in der Natur, zum Beispiel: Farben, Formen, Struktur oder Muster aus Licht und Schatten.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wenn ich etwas tue, werde ich so davon eingenommen, dass meine ganze Aufmerksamkeit darauf gerichtet ist.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Wählen Sie aus was am besten/ehesten auf Sie zutrifft.

Wenn ich Sport treibe, fühle ich mich optimal beansprucht.	Trifft nicht zu	Teils teils	Trifft zu
Wenn ich Sport treibe, laufen meine Gedanken bzw. Aktivitäten flüssig und glatt.	Trifft nicht zu	Teils teils	Trifft zu
Wenn ich Sport treibe, merke ich gar nicht, wie die Zeit vergeht.	Trifft nicht zu	Teils teils	Trifft zu
Wenn ich Sport treibe, habe ich keine Mühe, mich zu konzentrieren.	Trifft nicht zu	Teils teils	Trifft zu
Wenn ich Sport treibe, ist mein Kopf völlig klar.	Trifft nicht zu	Teils teils	Trifft zu
Wenn ich Sport treibe, bin ich ganz vertieft in dem, was ich gerade mache.	Trifft nicht zu	Teils teils	Trifft zu

Wenn ich Sport treibe,
kommen die richtigen
Gedanken/Bewegungen
wie von selbst.



Wenn ich Sport treibe,
weiß ich bei jedem
Schritt, was ich zu tun
habe.



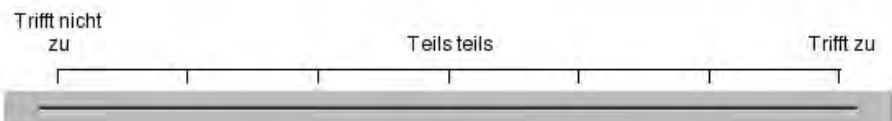
Wenn ich Sport treibe,
habe ich das Gefühl,
den Ablauf unter
Kontrolle zu haben.



Wenn ich Sport treibe,
bin ich völlig
selbstvergessen.



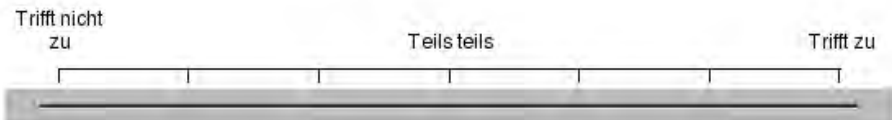
Wenn ich Sport treibe,
steht etwas für mich
Wichtiges auf dem
Spiel.



Wenn ich Sport treibe,
darf ich keine Fehler
machen.



Wenn ich Sport treibe,
mache ich mir Sorgen
über einen Misserfolg.



Sport, ...

	Stimme überhaupt nicht zu	Stimme eher nicht zu	Teils / teils	Stimme eher zu	Stimme voll und ganz zu
macht mir Freude	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
finde ich langweilig	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
mag ich nicht	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
genieße ich	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
macht überhaupt keinen Spaß	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
gibt mir Energie	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
deprimiert mich	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ist sehr angenehm	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
bedeutet, dass mein Körper sich gut anfühlt	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
gibt mir etwas	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ist sehr aufregend	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
frustriert mich	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ist überhaupt nicht interessant	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
gibt mir ein starkes Erfolgserlebnis	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
fühlt sich gut an	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
gibt mir das Gefühl, dass ich lieber etwas anderes machen würde	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Bitte geben Sie bei den folgenden Aussagen an, wie oft diese auf Sie, beim Sport treiben, zutreffen.

	Nie	Selten	Manchmal	Oft	Meistens	Immer
Beim Sport treiben, habe ich das Bedürfnis, perfekt zu sein.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Beim Sport treiben, fühle ich mich extrem gestresst, wenn nicht alles perfekt läuft.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Beim Sport treiben, strebe ich danach, so perfekt wie möglich zu sein.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Nachdem Sport getrieben zu haben, fühle ich mich niedergeschlagen, wenn ich nicht perfekt gewesen bin.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Beim Sport treiben, möchte ich alles perfekt machen.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Beim Sport treiben, ärgere ich mich maßlos, wenn ich Fehler mache.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Beim Sport treiben, ist es mir wichtig, in allem, was ich versuche, perfekt zu sein.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ich stelle mir beim Sport treiben so hohe Ansprüche, dass ich sie nicht erfüllen kann.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Beim Sport treiben, verlange ich von mir nichts Geringeres als Perfektion.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Beim Sport treiben, setzte ich mich durch meine extrem hohen Erwartungen unter Druck.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Beim Sport treiben, habe ich extrem hohe Erwartungen von mir selbst.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Nachdem ich Sport getrieben habe, bin ich enttäuscht, wenn ich nichts Perfektes geleistet habe.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>