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Do athletes' responses to coach autonomy support and control depend on the situation and athletes' personal motivation?

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ABSTRACT

Although plenty of studies have shown that a controlling, relative to an autonomy-supportive, motivating style yields a host of undesirable outcomes, at least some sport coaches endorse the belief that in some situations (e.g., when athletes misbehave) or with some athletes (e.g., those who are amotivated) a controlling approach is warranted and even beneficial. On the basis of Self-Determination Theory (Deci & Ryan, 1985; Ryan & Deci, 2017), the current study examined to what extent the effects of an autonomy-supportive and controlling coaching style depend on (a) the situation at hand and (b) athletes' personal motivation. To do so, we made use of an experimental vignette–based approach. Specifically, after having completed a validated questionnaire on their motivation to practice judo (i.e., autonomous motivation, controlled motivation, amotivation), 101 judokas (67.3% boys; Mage = 13.31 ± 1.54) were randomly assigned to either an autonomy-supportive or a controlling condition. In each condition, judokas read two comics representing distinct situations (i.e., athletes struggling with skill mastery despite their effort versus athletes not putting effort and disturbing practice), imagining themselves being the athlete in the comic. Having read the comic, athletes filled out a paper and pencil questionnaire in which they rated their anticipated need satisfaction/frustration, engagement, oppositional defiance, and anger. Results showed that the situational circumstances (i.e., athletes are misbehaving) attenuated, yet, did not cancel out, some of the detrimental effects of a controlling (relative to an autonomy-supportive) approach. Effects of coaches' motivating style appeared to be largely independent of athletes' motivation. The theoretical and practical significance of the results are discussed.

1. Introduction

> *"There is no need to pressure athletes when they are struggling with hard exercises. Yet, when they are disturbing practice athletes expect their coach to punish athletes who are behaving inappropriately." (Lisa, Coach)*

> *"Some athletes need pressure. If you don't pressure them they will not train hard enough." (Peter, coach)*

These statements illustrate that at least some coaches believe that in certain situations (i.e., when athletes disturb practice) or with some athletes (i.e., those who are poorly motivated), the use of a more controlling and pressuring approach may be beneficial. Grounded in Self-Determination Theory (SDT, Deci & Ryan, 1985; Ryan & Deci, 2017), a broad theory on human motivation, the main goal of this study was to examine whether the effects of a controlling (relative to an autonomy-supportive) coaching style on athletes' anticipated need-based experiences, anxiety, oppositional defiance, and engagement may depend on (a) the specific situational circumstances (i.e., athletes are putting effort into a hard exercise or athletes are displaying a lack of effort and are disturbing practice) and (b) athletes' motivation (i.e., athletes displaying autonomous motivation, controlled motivation, or amotivation). From a theoretical point of view, these questions are critical because they speak to the claim that a controlling motivating style is universally more detrimental than an autonomy-supportive style (Ryan & Deci, 2017). At the same time, these questions also have important applied value because they can provide more specific and nuanced information on which motivating style is most warranted under which circumstances and for which athletes.

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1.1. Autonomy-supportive and controlling coaching

According to SDT (Deci & Ryan, 1985; Ryan & Deci, 2017), athletes are more likely to persist and thrive when their coaches rely on an autonomy-supportive style rather than on a controlling style. When being autonomy-supportive, coaches solicit athletes' needs, wishes, and preferences, they use inviting and informational language, they encourage athletes to take initiative, they provide autonomy-supportive feedback, and they follow athletes' pace of development. When athletes show resistance, autonomy-supportive coaches acknowledge athletes' negative affect and provide a meaningful rationale for assigned tasks and requests (Aelterman, De Muynck, Haerens, Vande Broek, & Vansteenkiste, 2017; Carpentier & Mageau, 2013; 2016; Mageau & Vallerand, 2003; Reeve, 2016). In contrast, when using a more controlling style, coaches are more preoccupied with their own goals and ambitions, thereby enforcing their personal agenda onto the athletes. A controlling style involves relying on a variety of pressuring strategies such as the use of harsh, coercive language and commands, the offer of contingent rewards and (threat of) punishments, the display of conditional regard and even the use of intimidation and excessive personal control (Bartholomew, Ntoumanis, & Thøgersen-Ntoumani, 2010; De Meyer, Soenens, Aelterman, De Bourdeaudhuij, & Haerens, 2016).

A wealth of cross-sectional, longitudinal, intervention-based, and diary studies in youth sports has provided evidence that autonomy-supportive coaching relates to a host of desirable affective outcomes, including greater vitality (Adie, Duda, & Ntoumanis, 2012; Gagné, Ryan, & Bargmann, 2003; Reinboth, Duda, & Ntoumanis, 2004) and well-being (Haerens et al., 2018) as well as better behavioral outcomes such as engagement and motivation (Curran, Hill, Hall, & Jowett, 2014; Langan, Blake, Toner, & Lonsdale, 2015), mental toughness (Mahoney, Ntoumanis, Gucciardi, Mallett, & Stebbings, 2015), sustainable persistence (Pelletier, Fortier, Vallerand, & Brière, 2001), and performance (Cheon, Reeve, Lee, & Lee, 2015; Haerens et al., 2018). Conversely, controlling coaching relates to negative outcomes such as burnout (Balaguer et al., 2012), ill-being (Bartholomew, Ntoumanis, Ryan, & Thøgersen-Ntoumani, 2011; Haerens et al., 2018), and antisocial behaviors and resentment (Delrue et al., 2017; Hodge & Lonsdale, 2011).

The systematic evidence for the differential effects of controlling and autonomy-supportive coaching on athletes' outcomes is consistent with the notion in SDT that these coaching styles appeal differentially to athletes' basic psychological needs. Autonomy-supportive coaching has been shown to contribute to the satisfaction of athletes' psychological needs for autonomy (i.e., to experience a sense of volition), competence (i.e., to feel effective) and relatedness (i.e., to experience a warm relationship) (e.g., Haerens et al., 2018). In contrast, a controlling coaching style has been found to thwart athletes' psychological needs (Bartholomew et al., 2010). Because these psychological needs are considered universal, that is, to be operative and relevant to all athletes, one can assume that a perceived autonomy-supportive style is invariantly superior to a perceived controlling style in terms of fostering adolescents' motivation and well-being.

Does this universality claim imply that there is no variation whatsoever in effects of autonomy-supportive and controlling coaching? No. According to SDT, there is room for variability in the *degree* to which autonomy-supportive and controlling coaching affect athletes' outcomes (Deci & Ryan, 1987; Vansteenkiste, Aelterman, Haerens, & Soenens, 2019). While it is unlikely that a controlling style may be more adaptive than an autonomy-supportive style, the effectiveness of both styles may depend partly on the situation at hand and on athletes' personal characteristics (e.g., motivation) (Ryan, Soenens, & Vansteenkiste, 2019 in press; Soenens, Vansteenkiste, & Van Petegem, 2015).

1.2. The situation-dependent effect of coaches' autonomy support and control

In most previous correlational studies, the differential effects of autonomy-supportive and controlling coaching were investigated by tapping into coaches' typical style of motivating athletes, thereby not taking the situational characteristics into account. This shortcoming was partially addressed in experimental work examining the effects of coach provided autonomy support and control in the context of a specific situation (e.g., De Muynck et al., 2017). To date, these experimental studies mostly focused on situations in which athletes are trying to master a specific skill. For example, in a lab study in which undergraduate students learned to master a cricket throw, participants felt more self-efficacious, reported more positive affect, and were more accurate when instructions were given in an autonomy-supportive, compared to a controlling, way (Hooyman, Wulf, & Lewthwaite, 2014). Along similar lines, kickboxers showed a greater willingness to exert their practice drills when offered the possibility to choose the order of exercises compared to when such choice was denied (Wulf, Freitas, & Tandy, 2014). Finally, tennis players involved in an experimental field study reported more psychological need satisfaction and enjoyment and showed more behavioral perseverance when feedback was delivered in an autonomy-supportive, relative to a controlling, way (De Muynck et al., 2017).

Collectively, these experimental studies show that athletes who are practicing or even learning a new skill benefit from an autonomy-supportive approach. Yet, sport coaches do not only help athletes acquire and rehearse skills. Their role is also to monitor disciplinary matters and to intervene when athletes fail to display appropriate behavior during training (Aelterman, et al., 2017). In both roles, coaches are from time to time confronted with challenging situations. Specifically, despite their efforts, athletes sometimes struggle to master new skills. Also, athletes sometimes get distracted or they even show overt signs of resistance and disruptive behavior, thereby refusing to put effort into the exercises at hand.

Up until today, we are not aware of any study in the domain of sports that compares the effects of autonomy-supportive and controlling coaching in these different contexts. Particularly when athletes refuse to put effort in the activity or even display disruptive behavior, coaches may be inclined to react in a more controlling way. Indeed, studies in the educational literature revealed that when students disengage or show disruptive behavior, teachers tend to become more controlling (e.g., Grolnick, Weiss, McKenzie, & Wrightman, 1996; Skinner & Belmont, 1993; Van den Berghe, Cardon, Tallir, Kirk, & Haerens, 2016). Teachers may react in a controlling way in these circumstances because they hold the belief that when students disengage or display disruptive behavior a controlling approach is effective and, hence, necessary (Reeve et al., 2014). Moreover, also students expect their teacher to react against disruptive behavior (Evertson & Poole, 2008), perhaps even if their reaction is controlling. Like students, athletes may appraise a controlling intervention by their coach differently as a function of the specific features of the situation at hand. As it is relatively easy and effortless to refrain from disrupting practice, athletes may find that athletes who disrupt the training should be held personally accountable for their misbehavior through a forceful intervention. Moreover, because such disruptive behavior may have consequences for other athletes (e.g., the team), athletes may conceive a forceful intervention by the coach as legitimate, thus ending up with a relatively benign interpretation of a controlling reaction of their coach. According to the Social Domain Theory, a theory emphasizing the domain-specificity of effects of socialization (Smetana, 2011), such disruptive behavior involves a violation of conventional regulations. In the

conventional domain, socialization figures' (including coaches') setting of limitations is likely to be perceived as justified, even when the limits are provided in a rather pressuring way (Smetana, 2011). On the other hand, previous correlational (Soenens, Vansteenkiste, & Niemiec, 2009) and vignette-based (Mageau et al., 2018) studies in the parenting domain, pointed out that children still perceive an autonomy-supportive style of setting behavioral limitations as more acceptable and effective in fostering internalization, compared to a controlling style.

Athletes may perceive a controlling coach intervention very differently in a situation where, despite of their effort-expenditure, they keep struggling with the exercises. In these circumstances, a controlling approach may be perceived more illegitimate as the lack of mastery of the exercises falls outside the control of the struggling athlete and the athlete's behavior is less disruptive for the group process. From the Social Domain Theory perspective, athletes' lack of ability to competently perform the exercise falls under the personal domain (Smetana, 2011). Adolescents have been found to be particularly sensitive to socializing agents' involvement in these personal issues, which they then perceive as less legitimate, especially when such involvement is communicated in an intrusive way (Smetana, Wong, Ball, & Yau, 2014). For this reason, coaches' controlling interventions when athletes are struggling with exercises may get appraised as more intrusive and, hence, more harmful.

1.3. The role of athletes' personal motivation in the effects of coaches' style

Whether and how athletes are affected by autonomy-supportive or controlling coaching may depend not only on the situation at hand, but also on athletes' personal motivation. According to SDT (Ryan & Deci, 2017), athletes' motivation differs in terms of both quantity (motivation vs. amotivation) and quality (autonomous relative to controlled motivation). When athletes find an activity truly challenging and enjoyable (i.e., intrinsic motivation) or understand and endorse its personal value (i.e., identified regulation), they are said to be autonomously motivated. When their sport participation is driven by internal pressures such as guilt or shame (i.e., introjected regulation) or external pressures such as the threats of punishments or the offer of contingent rewards (i.e., external regulation), they display controlled motivation. When athletes lack a sense of goal directness or intentionality, when they feel aloof and they do not see the point in putting effort into the practice at hand, they are amotivated (Ryan, Lynch, Vansteenkiste, & Deci, 2011).

Most studies so far have modeled athletes' motivation as an outcome of coaches' motivating style (e.g., Haerens et al., 2018; Pelletier, Fortier, Vallerand, & Brière, 2001) or as a mediator in the relation between coaches' behavior and important outcomes (e.g., Healy, Ntoumanis, van Zanten, & Paine, 2014). Yet, given that there exist inter-individual differences in the amount and type of motivation that athletes bring to the sport club, athletes' motivation may also color the interpretation of the coach's motivating style and alter its effect, an idea that is consistent with the notion that individuals pro-actively interpret and shape the situation they are in (Reeve, 2013). In the literature, two hypotheses regarding the influencing role of athletes' motivation have been put forward. Specifically, the match hypothesis which is inconsistent with SDT (Vansteenkiste, Timmermans, Lens, Soenens, & Van den Broeck, 2008), involves the idea that athletes will display the most favorable outcomes when there is direct correspondence between their type of motivation and coaches' type of motivating style (e.g., autonomous motivation-autonomy-supportive style and controlled motivation-controlling style). In contrast, according to the sensitization hypothesis (Moller, Deci, & Elliot, 2010), athletes with high-quality motivation who have a longer history of need-supportive interaction patterns, would be more sensitive to the benefits of an autonomy-supportive coaching response, while being less sensitive to the costs associated with a new controlling event. Conversely, due to their history of need-thwarting experiences, athletes with poorer motivation would be particularly sensitive to the undermining effects of new need-thwarting (e.g., controlling) events, while reaping fewer benefits from autonomy-supportive coaching.

Both hypotheses yield partly overlapping and partly diverging expectations about the moderating role of athletes' motivation on effects of coaching style. According to both hypotheses, athletes who are more autonomously motivated would benefit more from autonomy-supportive coaches. Yet according to the *match hypothesis*, athletes with controlled motivation or amotivation would benefit more and even need more controlling coaches, while according to the *sensitization hypothesis*, athletes high on controlled motivation or amotivation, will suffer more when exposed to controlling coaching behaviors, because they will be more sensitive to it.

During the past two decades, the interplay between motivating style and personal motivation increasingly received attention in empirical work (e.g., Black & Deci, 2000; De Meyer et al., 2016; Mouratidis, Vansteenkiste, Sideridis, & Lens, 2011; Schüler, Sheldon, Prentice, & Halusic, 2014; Van Petegem et al., 2017). These studies typically focused on parents' and teachers' motivating style and yielded mixed results. Some studies provided direct (e.g., Mouratidis et al., 2011) or indirect (e.g., Schüler et al., 2014; Van Petegem et al., 2017) support for the overlapping premise of the match and sensitization hypotheses, showing that autonomously motivated individuals benefit more from the provision of autonomy-support. Yet, other studies did not support this idea, revealing that the benefits derived from autonomy support were either larger for those low on autonomous motivation (Black & Deci, 2000), or were largely independent of persons' autonomous motivation (e.g., De Meyer et al., 2016). A few studies yielded evidence for a sensitization effect. For instance, Van Petegem et al. (2017) showed that individuals with a history of need-thwarting were less sensitive to the benefits of autonomy-support. None of the studies provided support for the match hypothesis, while this hypothesis tends to hold truth in some people's lay beliefs (De Meyer et al., 2016; Ng, Thøgersen-Ntoumani, & Ntoumanis, 2012).

2. The present study

To examine our research questions regarding the moderating role of the situation and athletes' motivation, we chose to rely on an experimental vignette–based approach. Specifically, we developed four different vignettes in which a judo coach is interacting with two athletes, thereby crossing the style of interacting with athletes (i.e., autonomy-supportive relative to controlling) with the situation at hand. In one situation athletes were struggling, albeit putting effort into the exercises and in the other situation, they displayed a lack of effort and even disturbed the training session. The characteristics of judo naturally align with the investigated situations. That is, judo is a technical sport, in which athletes are challenged to master complex skills (i.e., related to the first situation). Judo also has a culture in which discipline is highly valued (i.e., related to the second situation; d'Arripe-Longueville, Fournier, & Dubois, 1998).

Consistent with SDT and with previous research, we generally expect that an autonomy-supportive style will be more beneficial than a controlling coaching style in terms of athletes' need-based experiences, felt anger, oppositional defiance, and engagement. Yet, we anticipate that the strength of this effect may depend partly on the situation at hand and athletes' motivation.

Regarding the effect of the situational manipulation, consistent with SDT, we hypothesize that even in the disruptive situation, an autonomy-supportive approach will be more effective than a controlling style (Deci & Ryan, 1987; Mageau et al., 2018; Ryan & Deci, 2017). Yet, we examine the possibility that the difference between an autonomy-supportive and a controlling coaching style may be less pronounced in the situation where athletes display disruptive behavior compared to the situation where they struggle mastering the exercises.

As regards judokas' personal motivation (i.e., autonomous, controlled and amotivation), two alternative sets of hypotheses can be

formulated. If the match hypothesis holds true, more autonomously motivated athletes would benefit more from autonomy-supportive coaching behaviors, yet controlled or amotivated athletes would benefit more from controlling coaching. If the sensitization hypothesis holds true, athletes high on autonomous motivation would be more sensitive to and therefore also benefit more from autonomy-supportive coaching behaviors. Athletes high on controlled or amotivation would likewise be more sensitive to the coaches' behavior and thus suffer more from controlling behaviors. Given the contradictory results in previous research on this matter (De Meyer et al., 2016; Mouratidis et al., 2011; Schüler et al., 2014), we do not posit directional hypotheses. In a very explorative fashion, we also consider the possibility that the situational characteristics and athletes' personal motivation interact in their influence on the effects of autonomy-supportive (relative to controlling) coaching. For instance, the combination of the two most benign or favorable conditions (athletes are in the situation where they struggle with a skill and the athlete's own motivation is autonomous in nature) may yield a surplus effect on the effectiveness of autonomy-supportive (relative to controlling) coaching.

3. Method

3.1. Participants and recruitment procedures

A convenience sample of 101 Belgian judokas (32.7% girls) out of 20 different judo clubs participated in the current study. They were on average 13.31 years of age ($SD = 1.54$), trained on average 3.69 h a week ($SD = 2.06$) and had on average 5.67 years ($SD = 2.61$) of experience in judo. Some judokas were approached through their coaches, with the coaches first asking permission of the judokas' parents by means of an electronic invitation distributed to the parents. If permission was obtained, a meeting with the judokas was scheduled after one of their practice sessions. Other judokas were approached directly at tournaments, and then the parents' consent towards participation was asked right away.

If parental consent was obtained, the researcher explained the format of the study to the judoka and addressed the judokas' questions (if any). During the explanation, it was ensured that judokas had every right to refrain from participating in the study, even if their parents had consented. Judokas who provided consent to participate filled out a paper-and-pencil questionnaire on their background characteristics and their general motivation to practice judo. The experimental phase was then scheduled after their next practice session, which was separated by a minimum of two and a maximum of seven days from the initial assessment. For the experiment, judokas were asked to read two comic books (one for each situation, i.e., athletes struggling with skill mastery despite their effort and athletes not displaying effort and disturbing practice), and to imagine that they were one of the two judokas in the comic book. After having read each of the two comic books, judokas filled out a paper-and-pencil questionnaire measuring their perceptions of the coach's interaction style, and their anticipated need-based experiences, as well as anticipated anger, oppositional defiance and engagement. The situations were presented in a counterbalanced manner to avoid that the sequence of the vignettes would influence the way athletes responded to the questionnaires. Both comic books contained experimentally manipulated vignettes concerning an interaction between a judo coach and two judokas in a practice session. The coach's response in the vignettes was presented in either an autonomy-supportive or controlling way, with judokas being randomly assigned to either an autonomy-supportive or a controlling condition. As such, a 2×2 design was created with the situational context (i.e., "struggling" versus "disruptive") representing a within-subjects factor and with condition (autonomy-supportive or controlling) representing a between-subjects factor. The study was approved by the ethical board of Ghent University.

3.2. Measures and materials

Pre- Experimental Measures. After providing information about background characteristics (i.e., gender, age, hours of training, experience, club) participants completed a validated 28-item scale (Assor, Vansteenkiste, & Kaplan, 2009) measuring their motivation to put effort into their judo practice. The stem "I put effort in training …" was followed by items to be rated on a 5-point-likert scale tapping into their intrinsic motivation (4 items; e.g., "because I find judo practice enjoyable"; $\alpha = 0.75$), identified regulation (4 items; e.g., "because I appreciate the advantages of judo practice"; $\alpha = 0.69$), introjected regulation (8 items; e.g., "because I would feel ashamed if I would not"; $\alpha = 0.78$), external regulation (8 items; e.g., "because I would get approval from my coach"; $\alpha = 0.87$) and amotivation (4 items; e.g., but I ask myself why I do it"; $\alpha = 0.79$). Next, a composite score was created for autonomous motivation (8 items of intrinsic motivation and identified regulation; $\alpha = 0.80$), controlled motivation (16 items of external regulation and introjected regulation; $\alpha = 0.88$) and amotivation (4 items; $\alpha = 0.79$).

Experimental Manipulation. Four different vignettes were created (see Appendix 1). More precisely, situations where judokas were struggling to master a skill, and where judokas were displaying disruptive behaviors during practice were created. These two situations were then crossed with either an autonomy-supportive or a controlling coaching style, resulting in a total of four different vignettes. Specifically, in the autonomy-supportive condition, coaching behaviors consisted of acknowledging the judokas' perspective, welcoming negative affect and resistance, providing choice and a meaningful rationale, while making use of informational language. In contrast, controlling responses consisted of ignoring judokas' perspective and negative affect, demanding compliance and providing only coach-centered rationales, threatening with punishment, while using controlling, guilt/shame-inducing language. Although the type of operationalized autonomy-supportive (e.g., offer of choice) and controlling (e.g., threatening with punishment) behaviors were held constant across the two situations (struggling vs. disruptive), the precise wording was slightly adjusted to fit the situation at hand as to maintain high ecological validity. All four vignettes were reviewed by a panel of experts in SDT, judokas and judo coaches to evaluate the autonomy-supportive and controlling nature, as well as the ecological validity and credibility of the coaches' responses. Based on these panel evaluations, only minor adjustments to the scenarios were made. The adjustments dealt with the sport specific jargon and with how a judo skill is usually learned and rehearsed in judo.

We chose a paper and pencil format instead of a video-based approach to avoid that situational differences would be contaminated by a different tone of voice. That is, when role playing the situations, actors may be inclined to use a harsher and more aggressive tone of voice when being controlling (Weinstein, Zougkou, & Paulman, 2018). Because tone of voice does not differ in vignettes delivered in a paper and pencil format, any observed differences in the present study could be attributed only to the different autonomy-supportive and controlling strategies and its different accompanying wording. However, we are aware that such an approach can suffer from lower immersion compared to a video-based approach (Aguinis & Bradley, 2014). Therefore, vignettes were presented in a comic book format, which depicted interactions between the judokas and the coach through text balloons. Together with the fact that judokas participated in the study directly following a practice session, these lively pictures may have allowed them to identify with the athletes in the situation and to be more fully immersed in the story (Aguinis & Bradley, 2014).

Manipulation Check: Perceived Autonomy Support and Control. Judokas' perceptions of the style of the coaches' responses were assessed using items based on the Teacher As Social Context Questionnaire (TASCQ; Belmont, Skinner, Wellborn, & Connell, 1988) and the Psychologically Controlling Teaching scale (PCT; Soenens, Sierens, Vansteenkiste, Dochy, & Goossens, 2012), which were found to be valid in the context of Physical Education (De Meyer et al., 2016). After reading the stem "If I would be one of the judokas in this training,

I would have the impression that the coach …" participants answered questions probing their perception of coaches' autonomy support (6 items; e.g., "… gives me the space to do things the way I would like to do things"; α = 0.74) or control (5 items; e.g., "… insists on doing things the way s/he likes to do things": α = 0.38). By dropping the controlling item "… tries to change the way I see things" the reliability of scale increased to α = 0.52. Items were answered on a 5-point Likert scale from 1 (*not at all true*) to 5 (*completely true*).

Need Satisfaction and Frustration. Needs-based experiences were assessed using a 6-item instrument based on the adapted version of the BNSFS (Chen et al., 2015). After the stem "If I would be one of the judokas in this training, I would …" participants answered to 3 items tapping into satisfaction of the needs for autonomy (i.e., "have the feeling I can be who I truly am"), competence (i.e., "have the feeling I am doing well, even with hard exercises"), and relatedness (i.e., "have the feeling that the coach truly cares about me") (α = 0.76), and 3 items tapping into frustration of the needs for autonomy (i.e., "experience it as an obligation), competence (i.e., feel as a failure because of the mistake I make") and relatedness (i.e., feel excluded) (α = 0.61).

Affective and Behavioral Reponses. Anger, oppositional defiance and engagement were assessed respectively with items adopted from Assor, Roth, and Deci (2004), Vansteenkiste, Soenens, Van Petegem, and Duriez (2014) and Skinner, Kindermann, and Furrer (2009). After the stem "If I would be one of the judokas in this training, I would …" participants answered to 3 items for anticipated anger (e.g., "be very angry with my coach"; α = 0.78), 4 for anticipated oppositional defiance (e.g., "rebel against the expectations of my coach"; α = 0.78) and 6 items for anticipated engagement (e.g., "work as hard as I could"; α = 0.84).

3.3. Plan of analyses

Preliminary Analyses. We first inspected descriptive statistics and Pearson correlations among all variables (see Table 1). To examine whether randomization was performed successfully, we tested through two-level (i.e., measures within athletes) multilevel regression analyses whether participants in the autonomy-supportive and controlling conditions differed according to their general background characteristics (i.e., age, hours of training, and years of experience). We used χ^2-analyses to examine gender distribution across conditions.

Primary Analyses. To address our research questions, we performed a series of two-level multilevel regression analyses with measures (i.e., for both situations), nested within athletes[1]. Then, variance components models (i.e., Model 0; Rasbash, Steele, Browne, & Goldstein, 2014) were tested to estimate how much of the variance in each of the outcomes is explained at the within (i.e., Level 1) and between-athlete level (i.e., Level 2). Next, we added relevant covariates (i.e., gender, age, hours of training, and years of experience) as well as experimental condition (i.e., autonomy-supportive versus controlling) to the model (See Model 1, Table 2). To examine our first research question considering the possible moderating role of the situation, we then added the main effect of situation, as well as situation by condition interaction effects to Model 1 (see Model 2, Table 2). In a similar way, and to test for the moderating role of students' motivation, we added main effects of all three types of motivation, as well as the three two-way interaction terms between types of motivation and condition to Model 1 (see Table 4). Finally, in a more exploratory way we also tested for possible "condition by situation by motivation" three-way interaction effects in a full model containing three-way interaction terms as well as all possible two-way interaction effects and the main effects condition, situation, and motivation.

4. Results

4.1. Preliminary Analyses

Table 1 shows the descriptive results, and the correlations between covariates and the study outcomes. Age related positively to anticipated anger and negatively to engagement. Number of training hours related positively to anticipated need satisfaction.

Randomization check. Multivariate analyses showed no significant differences in judokas' age ($F(1,98) = 0.89$, $p = 0.35$), years of experience ($F(1,98) = 1.26$, $p = 0.27$) and hours of training ($F(1,98) = 0.09$, $p = 0.77$) according to condition. Furthermore, no differences between conditions were found for athletes' baseline scores of autonomous motivation ($F(1,98) = 0.90$, $p = 0.35$), controlled motivation ($F(1,98) = 0.31$, $p = 0.58$) and amotivation ($F(1,98) = 0.04$, $p = 0.85$).

A χ^2-analysis indicated a significant difference in gender distribution across the experimental conditions ($\chi^2(1) = 4.49$, $p < 0.05$). Specifically, the autonomy-supportive condition contained relatively more boys (58.8%) than the controlling coaching condition (41.2%), while the controlling condition contained more girls (63.6%) than the autonomy-supportive condition (36.4%).

4.2. Primary Analyses

Inspection of the variance component models revealed significant variance at the between-athlete level and at the within-athlete (between-situations) level for all outcomes. The Intraclass Correlation

Table 1
Bivariate correlations between all assessed variables across both the struggling and the disturbing situation.

	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12
Covariates														
1.Age	13.31	1.54	–											
2.Training hours	3.69	2.06	.18*	–										
3.Experience	5.67	2.61	.49**	.25**	–									
Pre-Experimental														
4.Autonomous Motivation	4.28	0.50	-.17*	.15*	-.11	–								
5.Controlled Motivation	2.67	0.73	-.06	.17*	-.09	.19**	–							
6.Amotivation	1.62	0.82	-.12	.01	.01	-.42**	.17*	–						
Manipulation checks														
7.Autonomy Support	2.60	0.85	-.12	.04	-.01	.05	.09	.10	–					
8.Control	2.83	0.83	-.01	.07	-.09	.00	.08	-.06	-.44**	–				
Post-Experimental														
9.Need Satisfaction	2.63	0.90	-.09	.19**	-.03	.19**	.25**	.09	.70**	-.29***	–			
10.Need Frustration	2.77	0.95	.07	.06	-.08	-.06	.11	.04	-.43**	.48**	-.36**	–		
11.Anger	2.69	1.10	.18**	.04	.09	-.22**	.01	.11	-.60**	.44**	-.60**	.59**	–	
12.Oppositional Defiance	1.97	0.88	.05	.14	-.02	-.09	.31**	.25**	-.15*	.36**	-.03	.31**	.40**	–
13.Engagement	3.98	0.79	-.14*	-.10	-.07	.17*	-.03	-.18*	.24**	-.19**	.17*	-.25**	-.45**	-.60**

Note: $^*p < 0.05$, $^{**}p < 0.01$; $^{***}p < 0.001$

Coefficient (ICC; Lüdtke, Robitzsch, Trautwein, & Kunter, 2009) represents the percentage of variance lying at the between athlete-level as a proportion of the total variance. The lowest variance at the between-athlete level was found for engagement (32.85%), while the highest between-athlete variance was found for need satisfaction (56.72%). For all other of the studied variables, values were in between.

Manipulation Check. Results showed significant main effects of condition on judokas' perceptions of the coaches' autonomy-supportive and controlling style (Table 2). Judokas in the autonomy-supportive condition perceived the coach as more autonomy-supportive ($M = 3.05$) and less controlling ($M = 2.13$) compared to judokas in the controlling condition, who perceived their coach as less autonomy-supportive ($M = 2.56$) and more controlling ($M = 3.11$). These findings confirm the effectiveness of the manipulation.

Table 2
Main effects of Condition and Condition by Situation Interaction Effects.

Parameter	Autonomy Supportive Style		Controlling Style		Credibility		Need Satisfaction	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Fixed part	*B (S.E.)*	*B (S.E.)*	*B (S.E.)*	*B (S.E.)*	*B (S.E.)*	*B (S.E.)*	*B (S.E.)*	*B (S.E.)*
Intercept	3.05 (.08)	2.90 (.10)	2.63 (.08)	2.51 (.11)	2.91 (.10)	2.92 (.12)	3.03 (.10)	3.12 (.11)
Covariates								
Gender[a]	-.01 (.12)	-.01 (.12)	-.40 (.13)**	-.40 (.13)**	.27 (.16)	.27 (.15)	.09 (.14)	.09 (.14)
Age	-.07 (.04)	-.07 (.04)	.02 (.04)	.02 (.04)	-.10 (.05)	-.10 (.05)	-.06 (.05)	-.05 (.05)
Training hours	.02 (.03)	.02 (.03)	.04 (.03)	.04 (.03)	.03 (.04)	.03 (.04)	.09 (.03)**	.10 (.03)**
Experience	.03 (.02)	.03 (.02)	-.06 (.03)*	-.06 (.03)*	.01 (.03)	.01 (.03)	.01 (03)	.01 (.03)
Predictors								
Condition[b]	-.92 (.11)***	−1.24 (.14)***	.66 (.12)***	.80 (.16)***	-.25 (.14)	-.57 (.17)**	-.87 (.13)***	−1.10 (.16)***
Situation[c]		-.29 (.12)* (.08)***		.25 (.14)		-.02 (.11)		-.19 (.11)
Condition[b] × Situation[c]		.64 (.18)***		-.27 (.20)		.63 (.16)***		.45 (.16)**
Random part reference model	σ^2 (S.E.)	σ^2 (S.E.)	σ^2 (S.E.)	σ^2 (S.E.)	σ^2 (S.E.)	σ^2 (S.E.)	σ^2 (S.E.)	σ^2 (S.E.)
Athlete level variance	.26 (.07)	.06 (.05)	.18 (.07)	.08 (.06)	.29 (.08)	.27 (.07)	.42 (.09)	.24 (.06)
Repeated Measure level variance	.44 (.06)	.43 (.06)	.50 (.07)	.50 (.07)	.41 (.06)	.41 (.06)	.35 (.05)	.35 (.05)
Random part test model	σ^2 (S.E.)	σ^2 (S.E.)	σ^2 (S.E.)	σ^2 (S.E.)	σ^2 (S.E.)	σ^2 (S.E.)	σ^2 (S.E.)	σ^2 (S.E.)
Athlete level variance	.06 (.05)	.09 (.05)	.08 (.06)	.08 (.06)	.27 (.07)	.32 (.07)	.24 (.06)	.25 (.06)
Repeated Measure level variance	.43 (.06)	.38 (.05)	.50 (.07)	.48 (.07)	.41 (.06)	.32 (.05)	.35 (.05)	.32 (.05)
Test of significance								
IGLS Deviance reference model	476.57	423.30	479.51	452.42	473.22	470.22	476.62	441.11
IGLS Deviance test model	423.30	410.78	452.42	449.28	470.22	445.20	441.11	433.29
X^2 *(df)*	53.27 (5)***	12.52 (2)**	27.09 (5)***	3.14 (2)	3.00 (5)	25.02 (2)***	35.51 (5)***	7.82 (2)*

ParameteR	Need Frustration		Anger		Engagement		Defiance	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Fixed part	*B (S.E.)*	*B (S.E.)*	*B (S.E.)*	*B (S.E.)*	*B (S.E.)*	*B (S.E.)*	*B (S.E.)*	*B (S.E.)*
Intercept	2.41 (.10)	2.37 (.12)	2.23 (.10)	2.07 (.13)	4.13 (.09)	4.26 (.11)	1.87 (.10)	1.72 (.12)
Covariates								
Gender[a]	-.17 (.14)	-.17 (.14)	-.32 (.16)*	-.33 (.16)*	.16 (.13)	.16 (.13)	-.34 (.15)*	-.35 (.15)*
Age	.08 (.05)	.08 (.05)	.12 (.05)*	.12 (.05)*	-.07 (.05)	-.07 (.04)	.04 (.05)	.04 (.05)
Training hours	.04 (.03)	.04 (.03)	.01 (.04)	.01 (.04)	-.03 (.03)	-.04 (.03)	.07 (.03)*	.07 (.03)*
Experience	-.08 (.03)**	-.08 (.03)**	-.02 (.03)	-.02 (.03)	.02 (.03)	.02 (.03)	-.04 (.03)	-.04 (.03)
Predictors								
Condition[b]	.85 (.13)***	1.15 (.17)***	1.15 (.14)***	1.55 (.19)***	-.41 (.12)**	-.52 (.15)**	.42 (.14)**	.64 (.17)***
Situation[c]		.07 (.14)		.33 (.17)*		-.26 (.13)*		.30 (.14)*
Condition[b] * Situation[c]		-.61 (.20)**		-.79 (.24)**		.20 (.18)		-.43 (.20)*
Random part reference model	σ^2 (S.E.)	σ^2 (S.E.)	σ^2 (S.E.)	σ^2 (S.E.)	σ^2 (S.E.)	σ^2 (S.E.)	σ^2 (S.E.)	σ^2 (S.E.)
Athlete level variance	.29 (.09)	.12 (.07)	.40 (.12)	.09 (.09)	.18 (.06)	.14 (.06)	.24 (.08)	.20 (.07)
Repeated Measure level variance	.58 (.08)	.59 (.08)	.77 (.11)	.77 (.11)	.42 (.06)	.43 (.06)	.50 (.07)	.50 (.07)
Random part test model	σ^2 (S.E.)	σ^2 (S.E.)	σ^2 (S.E.)	σ^2 (S.E.)	σ^2 (S.E.)	σ^2 (S.E.)	σ^2 (S.E.)	σ^2 (S.E.)
Athlete level variance	.12 (.07)	.15 (.07)	.09 (.09)	.13 (.08)	.14 (.06)	.15 (.06)	.20 (.07)	.21 (.07)
Repeated Measure level variance	.59 (.08)	.52 (.07)	.77 (.11)	.69 (.10)	.43 (.06)	.41 (.06)	.50 (.07)	.48 (.07)
Test of significance								
IGLS Deviance reference model	526.77	492.95	583.43	534.48	451.24	440.97	489.57	480.76
IGLS Deviance test model	492.95	479.97	534.48	523.47	440.97	436.79	480.76	475.36
X^2 *(df)*	33.82 (5)***	12.98 (2)**	48.95 (5)***	11.01 (2)**	10.27 (5)	4.18 (2)	8.81 (5)	5.40 (2)

Note. $*p < 0.05$; $**p < 0.01$; $***p < 0.001$. Values in parentheses are standard errors.
[a] Gender reference category = boy;
[b] Condition reference category = autonomy supportive
[c] Situation reference category = struggling

Perceived Credibility. In terms of perceived credibility of the situations, no significant main effect of condition effect was found ($\chi^2 = 3.04$, $df = 1$, $p = 0.08$). Yet, a condition by situation interaction effect emerged: the autonomy-supportive approach was perceived to be more credible than the controlling approach in the "struggling" situation ($\beta = -0.57$, $\chi^2 = 11.95$, $df = 1$, $p \leq 0.001$), while no significant condition difference was found for the "disruptive" situation ($\beta = 0.06$, $\chi^2 = 0.12$, $df = 1$, $p = 0.73$).

Main Effects of Coaching Style. Judokas anticipated more need satisfaction ($\chi^2 = 42.54$, $df = 1$, $p \leq 0.001$) and engagement ($\chi^2 = 10.89$, $df = 1$, $p = 0.001$), and less need frustration ($\chi^2 = 40.77$, $df = 1$, $p \leq 0.001$), anger ($\chi^2 = 63.29$, $df = 1$, $p \leq 0.001$), and defiance ($\chi^2 = 9.22$, $df = 1$, $p \leq 0.01$) when they read the autonomy-supportive vignettes when compared to the controlling vignettes (see Table 2).

The Moderating Effect of Situation. Next, we examined condition by situation interaction effects in relation to the outcomes. For all but one outcome (i.e., engagement), we found significant condition by situation interaction effects. Significance levels ranged between $\chi^2 = 11.34$, $df = 1$, $p \leq 0.001$ for anger and $\chi^2 = 4.66$, $df = 1$, $p \leq 0.05$ for oppositional defiance. For anticipated need satisfaction, a controlling (relative to an autonomy-supportive) approach elicited less need satisfaction in both situations, yet the detrimental effects were stronger for the "struggling" situation ($B = -1.10$, $\chi^2 = 49.49$, $df = 1$, $p \leq 0.001$), when compared to the "disruptive" situation ($B = -0.65$, $\chi^2 = 17.29$, $df = 1$, $p \leq 0.001$). Similar, yet opposite, effects were found for anticipated need frustration and anger. While a controlling (relative to an autonomy-supportive) approach elicited more anticipated need frustration and anger in both situations, the detrimental effect of a controlling approach appeared larger in the "struggling" situation ($B = 1.15$, $\chi^2 = 46.81$, $df = 1$, $p \leq 0.001$ for need frustration; $B = 1.55$, $\chi^2 = 68.56$, $df = 1$, $p \leq 0.001$ for anger), when compared to the "disruptive" situation ($B = 0.55$, $\chi^2 = 10.68$, $df = 1$, $p = 0.001$ for need frustration, $B = 0.75$, $\chi^2 = 16.42$, $df = 1$, $p \leq 0.001$ for anger). As for judokas' anticipated oppositional defiance, we found that only for the "struggling" situation, athletes anticipated more defiance when exposed to a controlling coach ($B = 0.64$, $\chi^2 = 13.94$, $df = 1$, $p \leq 0.001$), while in "disruptive" situation no differences were found between an autonomy-supportive and controlling approach ($B = 0.22$, $\chi^2 = 1.59$, $df = 1$, $p = 0.21$). All averages are reported in Table 3.

Table 3
Means and standard deviations according to condition and situation.

	Situation Struggling-Effort	Situation Disturbing-Lack of effort
	B0 (S.E.)	*B0 (S.E.)*
Autonomy Support		
Autonomy Support	3.20 (.10)	2.91 (.10)
Controlling	1.96 (.11)	2.31 (.11)
Controlling		
Autonomy Support	2.51 (.11)	2.75 (.11)
Controlling	3.31 (.12)	3.28 (.12)
Credibility		
Autonomy Support	2.92 (.12)	2.91 (.12)
Controlling	2.35 (.13)	2.96 (.13)
Need Satisfaction		
Autonomy Support	3.12 (.11)	2.94 (.11)
Controlling	2.02 (.13)	2.29 (.13)
Need Frustration		
Autonomy Support	2.37 (.12)	2.44 (.12)
Controlling	3.53 (.13)	2.99 (.13)
Anger		
Autonomy Support	2.07 (.13)	2.39 (.13)
Controlling	3.61 (.15)	3.15 (.15)
Engagement		
Autonomy Support	4.26 (.11)	4.00 (.11)
Controlling	3.75 (.12)	3.69 (.12)
Defiance		
Autonomy Support	1.72 (.12)	2.02 (.12)
Controlling	2.36 (.14)	2.23 (.14)

The Moderating Effect of Judokas' Motivation. Next, we examined motivation (i.e., autonomous, controlled and amotivation) by condition interaction effects in relation to the outcomes. Of the 15 interaction terms tested (3 types of motivation by 5 outcomes) only one was significant (i.e., with autonomous motivation; See Table 4), namely in the prediction of need satisfaction. A test of simple slopes indicated that athletes reported less need satisfaction when they were exposed to the controlling coach as compared to the autonomy-supportive coach, especially when they were high (i.e., +1 SD above the mean) in autonomous motivation ($B = -1.27$, SE = 0.19, $z = -6.72$ p < 0.01). The respective difference between the controlling and autonomy-supportive approach was smaller among athletes who were around the mean in autonomous motivation ($B = -0.85$, SE = 0.12, $z = -7.20$, p < 0.001) and even smaller – yet still statistically significant - among those who were low (i.e., −1 SD below the mean) in autonomous motivation ($B = -0.44$, SE = 0.17, $z = -2.67$, p = 0.008). A graphical representation of this interaction is shown in Fig. 1.

In terms of main effects of motivation, we found that judokas who were more autonomously motivated, anticipated more need satisfaction ($B = 0.65$, $\chi^2 = 8.67$, $df = 1$, $p \leq 0.01$) and less anger ($B = -0.51$, $\chi^2 = 4.04$, $df = 1$, $p \leq 0.05$), while no significant relationships were found with anticipated need frustration, engagement or defiance. Judokas high on controlled motivation anticipated more oppositional defiance ($B = 0.33$, $\chi^2 = 6.62$, $df = 1$, $p \leq 0.05$), yet no significant relations were found with other outcomes. No significant main effects were found for amotivation.

Finally, we also explored whether there were significant "condition by situation by motivation" three-way interaction effects. None of these three-way interaction effects appeared significant (all $\chi^2 < 3.49$, $df = 1$, $p > 0.06$).

5. Discussion

Recent SDT-based research has shown that an autonomy-supportive and controlling coaching style are on average, respectively, beneficial and harmful for athletes' experiences, motivation, engagement, and performance (e.g., Wulf, 2007). Consistent with this research, results of the current study demonstrate that an autonomy-supportive, relative to a controlling, style predicts more need satisfaction and more engagement and less need frustration, anger, and oppositional defiance. Our findings thus corroborate the average adaptive effect of an autonomy-supportive coaching style.

Yet, some sport coaches raise doubts about whether in real life an autonomy-supportive coaching style would always, that is, under all circumstances and with any athlete, yield desirable outcomes (e.g., Ng, Thogersen-Ntoumani, & Ntoumanis, 2012). That is, some coaches hold the belief that in some situations (e.g., when athletes display disruptive behavior) and with some athletes (i.e., those high on controlled motivation or amotivation) a controlling approach is warranted and even more effective (Ng et al., 2012). While the idea that a controlling approach would sometimes be more effective than an autonomy-supportive approach is inconsistent with SDT's universality claim, SDT acknowledges that there might be gradation in the beneficial and harmful effects of an autonomy-supportive and controlling style, depending on both contextual and person characteristics (Deci & Ryan, 1987; Ryan & Deci, 2017; in press Ryan et al.,2019 ; Soenens et al., 2015). Yet, to date, this issue of gradation did not receive much attention in the context of sports. Therefore, the current study examined whether the anticipated beneficial and harmful effects of, respectively, an autonomy-supportive and controlling coaching style depend on (a) the situation at hand and (b) athletes' personal motivation.

5.1. Situation-dependency of coach autonomy support and control

The detrimental effects of a controlling approach appeared to be

Table 4
Condition by motivation interaction effects.

	Autonomous Motivation	Controlled Motivation	Amotivation
	Motivation × condition	Motivation × condition	Motivation × condition
	B (S.E.)	*B (S.E.)*	*B (S.E.)*
Autonomy Support	-.13 (.26)	.23 (.15)	.04 (.16)
Controlling	-.36 (.27)	-.19 (.16)	-.29 (.17)
Need Satisfaction	-.83 (.29)**	.13 (.17)	-.01 (.18)
Need Frustration	-.48 (.31)	.10 (.19)	-.13 (.19)
Anger	.39 (.33)	-.03 (.20)	.07 (.21)
Engagement	-.09 (.28)	.14 (.17)	-.12 (.18)
Defiance	.16 (.30)	-.04 (.18)	.08 (.19)

Note. Tested in a model including covariates and main effects of motivation and condition. $^{**}p < 0.01$.

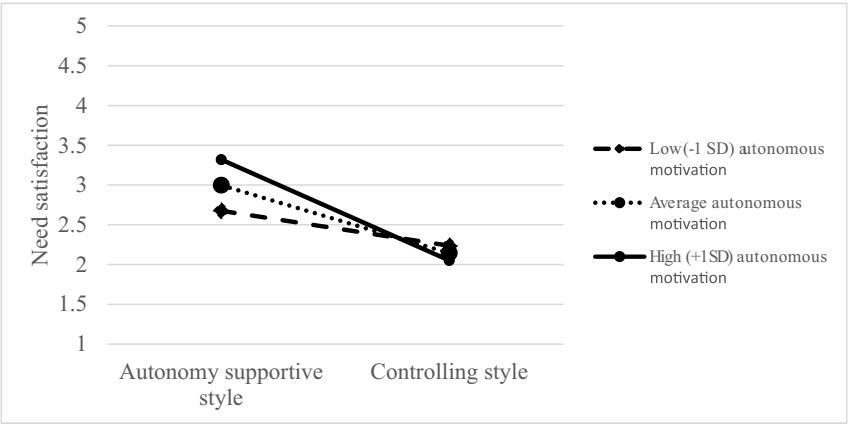

Fig. 1. Graphical representation of the Condition by Autonomous Motivation Interaction Effect in the Prediction of Need Satisfaction.

more pronounced in a situation where athletes are struggling albeit putting effort into the exercises when compared to a situation where athletes display disruptive behavior. Thus, when athletes envisioned a judoka who was approached by a controlling coach while struggling with the exercises (e.g., "just do as I say, it is not so hard"), they anticipated the least need satisfaction and the most need frustration, they indicated they would experience more anger and resentment, and they reported being more inclined to defy the request of the controlling coach all together. This was very different when the coach was holding an autonomy-supportive approach in the "struggling" situation. Then, athletes anticipated that they would experience high levels of autonomy (i.e., a sense of volition), competence (i.e., effective) and relatedness (i.e., warm relationship) satisfaction (with scores higher than 3 on a five-point scale) and low levels of autonomy (i.e., pressured), competence (i.e., failure) and relatedness (i.e., cold relationship, excluded) frustration (with scores of 2 on a 5-point Likert scale).

In a situation where athletes display disruptive behavior, the controlling approach (e.g., "if I must say it another time, you will get punished") was also detrimental (when compared to an autonomy-supportive approach) in terms of anticipated need satisfaction, need frustration, and anger. Yet, the effect was more modest in terms of effect size than in the struggling situation.

While the situation at hand thus seems to attenuate the detrimental effects of a controlling approach, it is important to note that, in both situations, an autonomy-supportive approach elicited more engagement than a controlling one and that even in the disruptive situation the autonomy supportive reaction was still more adaptive for most outcomes (except for oppositional defiance). As such, the current results demonstrate that the situational circumstances in which such coaching behaviors are displayed, only partially modify the extent to which these coaching behaviors influence judokas' anticipated experiences during practice.

How can this attenuating effect of the situation be explained? Studies in the educational literature show that teachers are pulled to act in a more controlling way when students misbehave (e.g., Grolnick et al., 1996; Skinner & Belmont, 1993; Van den Berghe et al., 2016). As such, a controlling reaction might come across as more normative, realistic and familiar in such a situation (Reeve et al., 2014). Our results provided some indirect support for this interpretation as athletes rated the controlling approach as more credible in the disruptive behavior compared to the struggling situation. Athletes may also have found such a demanding and more forceful response of the coach to be somewhat more legitimate and therefore less harmful (Way, 2011). After all, judokas have control over the amount of effort they display and the extent to which they engage in disruptive behavior. As such, they can be held accountable for their behavior in this situation. This is different when athletes are struggling with exercises. In this situation athletes may feel as if their lack of competence falls outside their control, and they may therefore feel not understood by a controlling coach. In their opinion, the controlling coach may fail to notice their efforts to master the activity and the fact of being considered personally accountable for making insufficient progress may even come across as intrusive. For this reason, the use of control under these circumstances may be perceived as less legitimate and, therefore, more harmful.

5.2. Motivation-dependency of coach autonomy support and control

In addition to considering the role of the situation at hand, we also investigated whether athletes' motivation moderated the effect of coaches' style. The results revealed that the effects of coaching style were

largely independent of judokas' personal motivation (with only one out of 15 interactions being significant). Further inspection of this interaction effect revealed that the effect was a matter of gradation. That is, the difference between the autonomy-supportive and controlling vignette in the prediction of need satisfaction was more pronounced for judokas high in autonomous motivation. Specifically, highly autonomously motivated athletes anticipated even more need satisfaction in response to an autonomy-supportive approach and even less need satisfaction in reaction to a controlling approach compared to individuals low in autonomous motivation.

Thus, athletes' motivation affected the degree to which an autonomy-supportive (relative to a controlling) approach elicited need satisfaction. Importantly, the condition effect was not cancelled, let alone reversed. Together, these findings suggest, in contrast to some coaches' beliefs regarding the motivation-dependent effectiveness of an autonomy-supportive or controlling approach (e.g., Ng et al., 2012), that the moderating role of athletes' motivation was rather limited. Our findings do not support the idea that a match between athletes' motivation and coaches' motivating style is warranted as has been suggested in previous research (Horn, Bloom, Berglund, & Packard, 2011; Schüler et al., 2014), as athletes high on controlled motivation or amotivation did not benefit more from a controlling approach. Neither do our results provide systematic support for the mechanism of sensitization that received some support in prior research with teachers and parents (e.g., Van Petegem et al., 2017). If the sensitization hypothesis would have been supported we would have found that athletes who were highly autonomously motivated would not only be more sensitive to an autonomy supportive approach but also be less sensitive to the detrimental effects of a controlling approach, while athletes low on autonomous motivation with a history of need-thwarting events would have been particularly sensitive to the undermining effects of new controlling events. Our results supported only the former part of the hypothesis but not the latter part.

Although only one moderation effect was obtained, such finding is informative in its own right. Indeed, the claimed universal benefits of a perceived autonomy-supportive coaching style begs the question of moderation by individual differences variables, an issue that has received increasing attention over the past few years (Vansteenkiste & Mouratidis, 2016). A host of potential moderators have been addressed in recent work, varying from personality differences (e.g., Hagger & Chatzisarantis, 2011; Mabbe, Soenens, De Muynck, & Vansteenkiste, 2018), to differences in need strength (e.g., Katz, Kaplan, & Gueta, 2010; Schüler et al., 2014; Van Assche, Van der Kaap-Deeder, De Schryver, Audenaert, & Vansteenkiste, 2018) and differences in motivation (e.g., De Meyer et al., 2016). Congruent with previous work by De Meyer et al. (2016), herein, limited evidence was found for the moderating role of athletes' type of motivation in the relationship between coaches' autonomy-supportive and controlling behaviors and athletes' sport experience. Interpreted differently, our findings suggest that an autonomy-supportive approach will most likely yield adaptive outcomes, and that a controlling approach will most likely lead to detrimental outcomes, even if athletes display high levels of controlled motivation or amotivation.

Finally, our findings also revealed some direct relationships between athletes' motivation and the outcomes. Irrespective of the coaching style they were exposed to, athletes who truly enjoyed or valued practicing judo (high on autonomous motivation) anticipated higher levels of need satisfaction and less anger. Further, athletes who scored high on controlled motivation anticipated more oppositional defiance. These findings suggest that these trait levels of motivation, which are likely to be rooted in a history of need satisfying (as for autonomous motivation) and need frustrating (as for controlled motivation) experiences determine to some extent (not systematically for all outcomes) how athletes respond to experimentally manipulated vignettes of a coaching situation.

5.3. Practical implications

In light of the findings demonstrating the benefits of an autonomy-supportive motivating style, an increasing number of researchers have developed and tested evidence-based interventions to train sport coaches to adopt a more autonomy-supportive style and have shown such interventions lead to better motivation and performance (e.g., Cheon, et al., 2015; Reynders et al., 2018). The present findings may help to bring a more nuanced message regarding the effectiveness of autonomy-supportive and controlling coaching, thereby also addressing coaches' and educators' critical questions. That is, during professional training programs, coaches and educators often raise doubts about whether in real life an autonomy-supportive style is always attainable (Reeve & Cheon, 2016), realistic and effective (e.g., Aelterman et al., 2013). Coaches particularly struggle to act in an autonomy-supportive way when athletes are fooling around, are disrupting practice, or display a lack of effort (Ntoumanis & Mallet, 2014; Occhino, Mallet, Rynne, & Carlisle, 2014; Reeve, 2009). In such situations, a strong reaction is called for and coaches may be inclined to convey their expectations in a fairly forceful manner by using commands ("It is enough, you must …"), by threatening with sanctions (e.g., "If I need to say it another time, then …) or by punishing (e.g., "you must sit aside now). Although coaches may hope to reorient athletes' attention to the exercise and to prompt them to extra efforts with such a forceful approach, they may end up with athletes who do not feel understood, as indexed by lowered need satisfaction, and who may even resist complying with the coaches' request, as indexed by the elevated anger, resentment and oppositional defiance. So, what is the alternative? Clearly, it is no option to become permissive under these circumstances and to hope that the situation resolves itself. Yet, the way of intervening seems to play a major role. In the present study, the coach in the autonomy-supportive vignette tried to take athletes' frame of reference, thereby being curious to hear athletes' perspective (e.g., "you seem to have problems to concentrate, how come?")[2] and acknowledging athletes' negative affect; he also provided a rationale (e.g., "I understand it is not easy to concentrate if you do not like this exercise too much, yet this exercise will help you with the next exercise …"), and even built in genuine choice (e.g., "you can choose, either you choose a different partner or you keep on working together and take the exercise seriously") to defuse the problematic situation. Although some coaches may consider such an autonomy-supportive approach as being "too soft" to adequately handle disruptive behavior, the current results indicate the opposite. Hence, the challenge for coaches is to consequently follow up on athletes' disruptive behavior (i.e., provide structure), yet do so in an autonomy-supportive way (see also Mageau et al., 2018 in the parenting domain). Indeed, past research, albeit not specifically related to athletes' disruptive behavior, has found that the combination of an autonomy-supportive style with the provision of structure is most ideal to promote engagement and autonomous motivation (Curran, Hill, & Niemiec, 2013; Jang, Reeve, & Deci, 2010; Vansteenkiste et al., 2012).

When athletes struggle with hard exercises, coaches' patience to follow athletes' pace of development may be challenged quite a bit. In such a situation it appears even more important to refrain from controlling strategies such as the use of controlling language (e.g., "I see you are making the same mistake over and over again, you must ….), pressuring athletes (e.g., "if others manage, you have to as well") or shaming them (e.g., "stop now, there is no point in proceeding like this"). Indeed, given the benefits of an autonomy-supportive approach were even more pronounced in this situation, coaches do well to maintain this style when athletes invest a lot of effort into hard exercises they are struggling with. As such, an autonomy-supportive style seems to help athletes stay positive and engaged when facing challenging or even competence-frustrating situations.

In sum, the present contribution may help to fine-tune existing intervention programs (Cheon et al., 2015; Langan, Toner, Blake, &

Lonsdale, 2015; Mahoney, Ntoumanis, Gucciardi, Mallett, & Stebbings, 2015), as our findings suggest that a controlling approach is especially likely to backfire when athletes fail to master an exercise despite their well-intended efforts. At the same time, coaches do well to maintain an autonomy-supportive stance even when their athletes display disruptive group behavior. By integrating these more refined conclusions in existing intervention programs, some of coaches' doubts about the effectiveness of autonomy-supportive practices and their convictions regarding the effectiveness of controlling coaching in cases of athletes' misbehavior could be addressed. Also, the vignette materials developed herein may offer a more precise insight in how coaches can maintain an autonomy-supportive stance under challenging circumstances, that is, when their athletes struggle with an exercise or disrupt the concentration of their team members.

Finally, the results of the current study suggest that coaches should not pursue an absolute match between their motivating style and athletes' motivation, as if an autonomy-supportive approach would only work for autonomously motivated athletes, while a controlling approach would be effective for athletes with poor quality motivation (i.e., controlled motivation and amotivation). Instead, based on the results of the experiment presented here, it can be hypothesized that, also in real-life, all athletes would thrive under autonomy-supportive conditions and suffer from controlling strategies. We would like to caution, however, that the current findings do not suggest that an autonomy-supportive style represents a motivational cook book, including recipes that work all the time for all athletes. An autonomy-supportive style in essence requires coaches to adopt a curious and receptive attitude as to fully understand the athletes' frame of reference (Aelterman et al., 2017; Vansteenkiste & Soenens, 2015). Autonomy-supportive coaches flexibly adapt their strategies to the athletes in front of them, in an attempt to identify, nurture, and develop their inner motivational resources. Indeed, such an empathic stance is perhaps the most central feature of an autonomy-supportive style (Mageau, Sherman, Grusec, Koestner, & Bureau, 2017; Soenens, Deci, & Vansteenkiste, 2017; Vansteenkiste, Niemiec, & Soenens, 2010).

5.4. Limitations and future directions

Some limitations of the current study require attention. First, due to the repeated measurement design, we limited the number of items per construct as to avoid response fatigue among participants. However, this item reduction may account for the lower internal consistency of some of the assessed constructs. Because the scales with lower internal consistency include a substantial part of error variance (next to substantive variance capturing the essence of the construct), associations of these scales with other measures may be affected by error variance and may, most likely, be suppressed (thus representing an underestimation of the true association). Second, the vignettes used to standardize participants' exposure to autonomy-supportive or controlling coaching behavior were very distinct and may not correspond with daily reality. In real-life many coaches rely on a mixture of strategies (e.g., Haerens et al., 2018), alternating between more autonomy-supportive and more controlling strategies within a situation. The pronounced difference between the two conditions not only account for strong condition effects, this difference may also have reduced the probability of obtaining evidence for the moderating role of the situation and athletes' motivation. These moderating variables may play a more significant role in more ambiguous situations, involving a combination of both styles. Third, although the use of written vignettes has its advantages (e.g., no interference of body language or intonation), because we assessed athletes' hypothetical responses to the vignettes we cannot tell with certainty whether they would feel and respond the same way in an actual training. Also, written vignettes are less vivid than interactions put in scene and presented via video demonstration (e.g., Aguinis & Bradley, 2014; De Meyer et al., 2016). As such, they rely heavily on participants' imagination and access to anticipated emotions and behavior. In future work one could also try to address our research questions by manipulating sport coaches' style in a real-life context and by assessing athletes' real-life responses and feelings (e.g., Mouratidis et al., 2011). Finally, the observed differences between both situations in terms of perceived autonomy support may be due to the situational differences themselves, but could also be explained by the slightly different operationalization of the specific autonomy-supportive behaviors between situations. Although the type of operationalized autonomy-supportive behaviors (e.g., provision of choice; communication of a meaningful rationale) was kept constant across situations, the exact wording was adjusted to the situation at hand to maintain high ecological validity. Future research may try to keep the wording perfectly constant across situations to draw unambiguous conclusions regarding the observed differences in autonomy support between both situations.

6. Conclusion

Coaches do not only help athletes to develop skills, they also have an important role in monitoring disciplinary matters and in regulating athletes' appropriate behavior during training. Moreover, from time to time they also deal with athletes who are less optimally motivated. The current study addressed the question whether in disciplinary situations, or with poorly motivated athletes, a controlling approach may be warranted. Although we found that the differences between the autonomy-supportive and controlling approaches were less pronounced in situations where athletes disrupt the training compared to situations where athletes struggle to master a skill, neither the situational circumstances (e.g., athletes are misbehaving), nor athletes' personal motivation (e.g., they show more controlled motivation or amotivation) cancelled out the benefits of an autonomy supportive, relative to a controlling, approach. These findings provide further support for the theoretical claim that a controlling motivating style is universally more detrimental then an autonomy-supportive style (Ryan & Deci, 2017). Although disruptive athletes or poorly motivated athletes may pull for a controlling approach from coaches, the present findings suggest that even under these more challenging circumstances coaches would do well to adopt an autonomy-supportive stance.

Conflicts of interest

We wish to confirm that there are no known conflicts of interest associated with this publication and there has been no significant financial support for this work that could have influenced its outcome.

We confirm that the manuscript has been read and approved by all named authors and that there are no other persons who satisfied the criteria for authorship but are not listed. We further confirm that the order of authors listed in the manuscript has been approved by all authors.

We confirm that we have given due consideration to the protection of intellectual property associated with this work and that there are no impediments to publication, including the timing of publication, with respect to intellectual property. In so doing we confirm that we have followed the regulations of our institutions concerning intellectual property.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.psychsport.2019.04.003.

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Note 1

We did not consider a three-level model (with measures nested within athletes within coaches/clubs), because due to the recruitment procedure the distribution of participating judokas across sports clubs was very unbalanced (for 7 of the 20 clubs only one judoka was questioned).

Note 2

Although the questions asked by the coach were meant to signal interest and to carry high informational value, coaches can also ask questions in fairly confrontational and interrogative, thereby coming across as distrustful and evaluative. Although Reeve and Jang (2006) identified asking questions as one autonomy-supportive behavior, its perceived functional significance (Deci & Ryan, 1985) likely depends on the exact wording, its accompanying tone of voice (Weinstein, Zougkou, & Paulmann, 2018), the timing of the question, and the presence of additional autonomy-supportive or controlling behaviors among other factors (see Vansteenkiste, et al., 2019).

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