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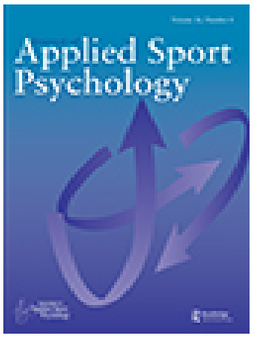

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The Development and Initial Validation of a Measure of Coaching Behaviors in a Sample of Soldiers Under Training

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Abstract

In this manuscript we outline a model of coaching that is conceptually grounded in workplace and sport coaching literature and present two studies conducted to test this model, the extent

coaching behaviors are present in a military training setting, and their association with performance-related outcomes. Following an extensive review of literature and rigorous development and validation procedures the 28-item Military Coaching Behavior Scale (MCBS) was tested. The measure showed good content and predictive validity for two dependent variables (satisfaction and resilience). We concluded the MCBS offers a psychometrically sound, brief, and easy to administer measure of high performance coaching behavior.

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The development and initial validation of a measure of coaching behaviors in a sample of soldiers under training

Coaching is present in almost every organizational domain and generally refers to leaders' attempts to improve performance by facilitating the acquisition of new knowledge, skills and competencies. While the term "coach" might refer to an individual's defined job role, such as a sports coach or a business coach, coaching describes a way of interacting with people. That is, coaching is a type of behavior that leaders will engage in to a lesser or greater extent. The notion that leaders may adopt coaching type behaviors and that these behaviors have benefits for their followers is not new. Indeed, elements of coaching behaviors have been referred to in prominent models of leadership such as transformational leadership theory (Bass, 1985). Yet, containing coaching within a broad behavioral framework limits its scope and research is required focusing specifically on coaching behaviors.

The application of coaching is perhaps most synonymous with environments in which sustainable high performance is required, such as elite sport. Nevertheless, the popularity of coaching has also spread to other high performance domains such as the special forces and

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military, business, and performing arts (e.g., Gordon, 2007; Gould & Wright, 2012; Grant, 2006). This diffusion of coaching practice is perhaps not surprising given the frequency with which scholars have highlighted parallels and opportunities for knowledge transfer between high performance domains (for recent reviews, see Fletcher & Wagstaff, 2009; Gould & Wright, 2012; Wagstaff, Fletcher & Hanton, 2012). Despite these parallels, Gould and Wright (2012) called for greater cross-fertilization of knowledge across coaching silos in order to, "allow for the identification of general principles that cut across fields, while at the same time helping to identify more context-specific guidelines and highlighting idiosyncratic coaching practices" (p. 357). Hence, the purpose of the research presented here is to develop and validate a new measure of leaders' coaching behaviors, to examine the extent to which leaders use coaching behaviors in a military training setting, and assess their association with performance-related outcomes. First, we define high performance coaching and provide an overview of the extant silos of coaching theory and research that facilitated our model development.

High Performance Coaching

We view high performance coaching (HPC) as a cross-disciplinary methodology that can be employed by leaders to promote positive change across multiple social levels (e.g., individual, dyadic, group, organizational) and professional domains (e.g., military, sport, business, performing arts). HPC is the systematic application of collaborative, individualized, solution-focused psychological practices by leaders to enhance individual, group, or organizational performance. It is intended to support individuals in better regulating and directing their intrapersonal and interpersonal resources to attain goals and help individuals to maximize strengths through self-directed learning. Hence, coaching-type behaviors reflect a cluster of

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techniques that leaders might use alongside leadership-type behaviors (e.g., transformational leadership behaviors), that are both conceptually distinct and employed to achieve different goals (for a review and further delineation of these terms, see Arthur, Wagstaff, & Hardy, 2017).

Some of the early work on HPC was conducted in the sport context, with models developed by Chelladurai and colleagues, Smith, Smoll and colleagues, Horn, Côté and colleagues, and Mageau and Vallerand providing insight into the effects of coach behaviors, some processes and mechanisms by which these behaviors exert their influence, and the moderating effects of situation, context, and personality (see, for reviews, Becker, 2012; Cote, Bruner, Erickson, Strachan, & Fraser-Thomas, 2010; Cote & Gilbert, 2009; Cushion, 2010; Gilbert & Trudel, 2004; Lyle, 2002; Gould & Wright, 2012). Despite the value of this work for understanding of the complexity of coaching in sport, there are a number of caveats regarding the use of this work across HPC domains. First, the dearth of attention these models have received outside of sport obscures their utility for practice in other high performance domains. Second, the International Coaching Foundation (ICF) propose that "professional" coaching differs from traditional sport coaching as it allows the experience and knowledge of the coachee rather than the coach to guide sessions, and focuses on opportunities for the development of individual strengths and capabilities rather than correcting incorrectly or poorly executed behaviors (ICF, 2011). Third, it is difficult to provide guidance for coaches from extant coaching models due to their numerous interacting and mediating variables. Indeed, scholars have emphasized the importance of identifying and distinguishing between various patterns of behavior that permeate coaching (cf., Cushion, 2010). Given these observations, it would appear that coaching behaviors (i.e., what coaches *do*) have been sidelined amid the search for holistic models of the coaching

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setting. Therefore, we aim to refine and deconstruct coach *behaviors*, to provide a framework to help researchers, practitioners, and leaders understand this phenomenon.

While some of the early coaching research and theory development emanated from sport, the value of coaching in business (e.g., executive coaching) has also been noted for some time. For example, some of the early articles on coaching described efforts to develop managers in various fields (e.g., Davis, 1958; Utgaard & Daws, 1970). Despite the recent growth of business coaching, this domain has no governing, regulatory, or credentializing body and is populated by individuals offering coaching services who emanate from diverse backgrounds (e.g., management, education, sales), with varying qualifications, and often no training in psychological science. As a result, there are almost as many proprietary business coaching models - many with little or no empirical grounding - as practitioners (see for reviews, Ellinger, Ellinger & Keller, 2003; Grant, 2006; Kampa-Kokesch & Anderson, 2001). Hence, only models which are theory-driven and grounded in scientific research are reviewed here. Probably the best known of these is the GROW model (see Whitmore, 1996) which has received preliminary evidence to support its effectiveness for promoting personal responsibility, performance ownership, autonomy, intrinsic motivation and pleasure (e.g., Grant, Curtayne, & Burton, 2009). Noting the dearth of empirical research in this area, Ellinger et al. (2003) developed a measure of coaching behavior in business contexts. The measure consisted of an eight-item instrument based on the findings of prior qualitative critical incident research, with supervisory coaching behaviors being positively associated with job satisfaction and performance in warehouse employees. More recently, Grant (2006) proposed a step-based approach for workplace coaching that draws on the goal setting, self-determination and personality literature. According to Grant it

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is the coach's role to facilitate the coachee's movement through self-regulation steps by: identifying an issue, setting a goal, developing an action plan, acting, monitoring, evaluating what works and making necessary changes toward goal attainment. Grant also urged coaches to align their practice to individual coachee's personality style (e.g., narcissistic, antisocial, dependent, avoidant), needs (admiration, power, affiliation, evaluation avoidance) and current stage of change (e.g., precontemplation, contemplation, preparation, action, maintenance, and relapse). Whilst no research has specifically tested Grant's model, it is founded on well-established areas of psychological theory and has the potential to inform HPC in other domains.

An Integrated Model of Coaching Behavior

We outline a model of high performance coaching that is conceptually grounded in extant sport and business coaching models. In doing so, we highlight five practice activities that epitomize what high performance coaches do: observing and performance analysis, asking effective questioning, facilitating goal setting, providing developmental feedback, and motivational feedback.

Observing and performance analysis. The literature emanating from a range of domains has highlighted the importance of observation as a coach behavior (Cote et al., 1995; Ellinger et al. 2003; Lyle, 2002). This behavior might be defined as the extent to which the coach closely observes their coachees and engages in performance analysis. Indeed, observation serves as the first step in the dynamic and systematic process of performance analysis. The importance of this dimension also lies in its emphasis on parity which is often absent from leadership models. Such collaborative behaviors are key to coaching and also distinguish it from similar approaches (e.g., mentoring, counselling), where guidance is offered following observation. That

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is, coaching is distinct from these disciplines as it is based on a collaborative relationship, which aims to facilitate skill development and motivation enhancement through subsequent feedback (Greene & Grant, 2003). Crane (2002) proposed executive coaches' job descriptions should include the criteria of observing a client's work closely enough to provide relevant and substantive feedback in a timely manner. Ellinger et al. (2003) also found observation-related themes to relate to employee satisfaction and performance outcomes. That is, supervisory coaching behavior - including providing observational, reflective, and third party feedback - accounted for 11% of the variance in supervisors' perceptions of their employees' performance. Ellinger et al. concluded by arguing that observation and analytical skills are critical for managerial coaching to facilitate employee satisfaction and performance.

Effective questioning. This behavior might be defined as the extent to which coaches engage in asking questions that encourage thought and reflection. In organizational studies, Schein (1969) coined the term "process consultation" to describe the business consultant's (i.e., coach's) role within an organization as nondirective but questioning. Process consultation emphasizes building effective helping relationships through collaborative work with coachees in order that they begin to solve their own obstacles to goals. Thus, a core corollary goal for coaches is to act as facilitators of change who can promote independent rather than passive learning. By asking effective questions rather than blithely providing feedback without invitation, the coach is likely to promote self-directed learning by providing cues to appraisal and reflection.

Effective questioning is influenced, in part, by the democratic behavior dimension of the Leadership Scale for Sports (LSS; Chelladurai & Saleh, 1980), Ellinger et al.'s (2003) question-

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framing behavior theme, and the GROW model. Effective questions are open-ended, facilitate reflection, seek descriptive rather than evaluative information, and are future-oriented to facilitate performance enhancement. Thus, questioning supports autonomy, empowers coachees and drives growth and performance in an informal, conversational and supportive manner. The need for and importance of flexible questioning behaviors has been widely observed (e.g., Partington & Cushion, 2011) because they encourage active learning through problem solving, discovery and self-awareness. Grant and Stober (2006) emphasized the salience of such techniques, stating, "it is clear that coaching is more about asking the right questions than telling people what to do" (p. 3). Further, Ellinger et al. (2003) found that posing outcome results-oriented questions or context-specific questions to encourage learners to think through issues themselves was associated with employee satisfaction and performance outcomes.

Goal setting. Goals are ubiquitous within the training environment and they reflect one of the most researched areas in psychology. They have been defined as, "what an individual is trying to accomplish; it is the object or aim of an action. The concept is similar in meaning to the concept of purpose and intent" (Locke, Shaw, Saari, & Latham, 1981, p.126). Goal-related research has been conducted since the 1960s with findings in almost all circumstances supporting goal setting as a performance enhancement technique (e.g., Locke & Latham, 2002). Given the omnipresence of goal setting, it is not surprising that it reflects a central concept within many extant coaching models. For example, Cote et al. (1999) proposed six items assessing coaches' involvement in the identification, development, and monitoring of goals. The coach behavior scale for sport (CBS-S) also invites athletes to provide qualitative comments about their coaches' ability to facilitate goal setting. Research (e.g., Ellinger et al., 2003; Grant et

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al., 2009) has also shown support for the use goal setting coaching behaviors in business contexts. For example, using a 10-week randomized controlled design Grant et al. found executives in an experimental coaching group to have enhanced goal attainment, increased resilience and well-being, and reduced depression.

Developmental feedback. Feedback is critical information that helps an individual understand how they are performing and what changes, if any, might be made. Coaches provide feedback for a range of outcomes that require different tools and techniques (Natale & Diamante, 2005; Skiffington & Zeus, 2003). One of the key areas for feedback is the development of skills and strategies that align with coachee goals. For instance, developmental feedback provides coachees with direction and builds self-awareness, self-reflection and performance improvement in a collaborative manner (Zhou, 2003). In organizational psychology literature Li, Harris, Boswell, and Xie (2011) stated that, "developmental feedback is aligned with intrinsic motivation theory… and enhances his or her interest in the job itself toward learning and improvement" (p. 1318). That is, developmental feedback shares similarities with three of Ellinger et al.'s (2003) coaching behavior themes: personalizing learning situations with examples and using analogies and scenarios, seeking feedback from learners about their progress, and providing resources, information and material to learners. In Ellinger et al.'s study, they found each of these themes to be related to employee satisfaction and performance outcomes. A cursory glance at the research examining coach feedback behaviors highlights instruction as the largest single behavior identified by systematic observations of sport coaching practice (e.g., Cushion & Jones, 2001). Chelladurai and Saleh's (1980) leadership scale for sport (LSS) has 13 items relating to training and instruction. Instruction is also present in Smith et al.'s

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CBAS measure with the dimensions of mistake-contingent technical instruction and general technical instruction. Moreover, Mageau and Vallerand (2003) highlighted the importance of providing informational feedback to athletes to enhance autonomy.

Motivational feedback. A substantial body of work highlights the salience of positive feedback, or behavior that reinforces the coachees by recognizing and rewarding good performance. By providing genuine positive feedback regarding an individual's development and progress, coaches are likely to satisfy autonomy and competence. Moreover, coaching research has highlighted that this autonomy support has been positively related to self-determined motivation, persistence, changes in subjective vitality, and negatively associated with amotivation (e.g., Reinboth, Duda, & Ntoumanis, 2004). Hence, these autonomy-supportive coach behaviors are likely to be an important and desirable component of the motivational climate in military environments. We define motivational feedback as the extent to which the coach praises desirable behaviors. The rationale for including such behavior comes from Benjamin's (1974) interpersonal theory, in which she proposes blame is the opposite of affirmations like praise because it is hostile and controlling, whereas praise is friendly and autonomy-granting. The LSS has 5 items relating to positive feedback which refers to the coach's reinforcement, recognition and rewarding of good performance. The coaching behavior assessment system (CBAS) also acknowledges the importance of motivational feedback, with Smith et al. (1977) proposing two similar themes - reinforcement and general encouragement.

In line with the integrated model of high performance coaching outlined above, the remainder of this manuscript presents two studies conducted to test this model and examine the extent to which these behaviors are present in a military training setting as well as their

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association with performance outcomes. The military context was selected for several reasons. First, there are substantial links across high performance domains and we hypothesize that the HPC model has application and utility across such domains. Second, the structured, time-bound, and competency-based nature of Phase 1 military training, offered the most suitable training context to control for the study variables. That is, sport rarely offers such a rich natural laboratory for researchers to study the relationships between coaching behaviors and outcomes without the influence a priori coach-coachee interaction. We expected the coaching behaviors to be highly correlated as they all belong to the same higher order construct of coaching. Nevertheless, the behaviors are all theorized to be separate as they all tap unique conceptual aspects of coaching and thus will not be indicative of a second order model.

Study 1

Method

Participants

This study was conducted with phase 1 soldiers under training (SuTs). Phase 1 training is competency-based and is designed to train basic soldiering skills for all non-infantry soldiers. At the time of the study phase 1 training lasted for 15 weeks. After successful completion of phase 1, soldiers progress to specialization training (e.g., engineering, support weapons, logistics). In total, 350 Soldiers under training (SuTs) agreed to take part in the study, consisting of 312 males, 37 females, and on person who did not specify gender. The majority of the sample of reported being British (n = 320) with a total of 12 other nationalities making up the rest of the sample (e.g., Ghanaian, South African, Kenya, Pakistani, Irish, Fijian, Italian). However, 15 did not complete the section level identifier and were thus removed, leaving a sample of 335 (M^{age} =

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20.96, *SD* = 3.51) SuTs allocated to 43 sections (average SuTs per section = 8 (SD = 2.39). The SuTs were in week 4 to week 8 of training ($M^{week\ of\ training}$ = 6.67, *SD* = 1.21). At the beginning of their phase 1 training course SuTs are allocated to a training section that consist of approximately 10 SuTs and remain in this section for the duration of training. Each section is led by a single section corporal who responsible for the day to day training of the SuTs in their section. Section corporals will spend a considerable amount time with the SuTs in their section, in excess of 10 hours per day for the duration of training. The coaching behaviors of these section corporals, as perceived by their SuTs are the focal point of the current research.

Measures

An initial literature search of the sport coaching literature was undertaken to identify potential existing measures / subscales that could be used or slightly modified to suit the military context. Two suitable subscales were identified from existing measures in the sporting context, namely, the goal setting scale from (Côté et al., 1995) and the positive feedback scale from the leadership scale for sports (Chelladurai & Saleh, 1980). Nevertheless, in our review we could not find any suitable measures of the other three coach behaviors identified in the review. Consequently, we followed standard procedures for developing scales. Namely, an item pool was generated that was designed to tap the theoretical content for each of the behaviors identified. The items were then scrutinized by experts in sports coaching and leadership and were further refined or, where appropriate, deleted. This process resulted in a 28-item pool (see Table 1) that was taken forward into the empirical testing phase. The stem for each item was “My section corporal...”, with a response format of 1 (not at all), 2 (once in a while), 3 (sometimes), 4 (fairly often), and 5 (all of the time).

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Procedures

The research team consisted of civilian research staff. Data were collected from intact platoons (sometimes to referred to as Troops) in a classroom setting. The research team were introduced to the SuTs by either a senior Non Commissioned Officer or an Officer of rank Major who was not part of the SuTs training team. All military personal (except the SuTs) then left the classroom. The SuTs were then briefed by the civilian researchers on the purpose of the study and the methods that were used by the research team. A major focus of the brief was to assure confidentiality and that no military personal would see completed questionnaires. It was also explained that anonymity would be maintained in the report writing stage of the research whereby no individual, section or platoon would be identifiable. The SuTs were then explicitly informed of the voluntary nature of the research, and were told that participation was voluntary and could withdraw at any time. Informed consent was obtained and SuTs were given the questionnaires to complete. When all the questionnaires were completed they were placed in an envelope, and sealed.

Data analysis

Given that the current data consisted of SuTs nested within sections, the nested nature of the data needs to be addressed. Multilevel confirmatory factor analyses (MCFA), where the within-group and between-group variance is modeled simultaneously, is regarded as an appropriate method to examine the factor structure of measurement models where the data is meaningfully nested (e.g., Muthén, 1989). In the current samples the item level intraclass correlation coefficients ranged from .07 to .21 (average item level ICC = .14) in Study 1, and from .05 to .21 (average item level ICC = .13) in Study 2, suggesting that the data was

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meaningfully nested. Whilst MCFA is considered optimal it requires large level two samples, with Hox and Maas (2001) suggesting that the Level 2 sample size should be $N \geq 100$ (i.e., 100 sections). However, in samples where the Level 2 N is considerably less than 100 then analyzing the pooled within-cluster covariance matrix effectively controls for the nested nature of the data (Hox & Maas, 2001; Muthén, 1989). In order to account for the nested nature of the data we adopted the recommendations of Muthén (1989), and Hox and Maas (2001) by imposing the TYPE = COMPLEX command in Mplus 6.12 with ordinal data. This controls for the nested nature of the data and results in modeling the asymptotic within-teams covariance matrix, $\mathbf{S_W}$ (Asparouhov & Muthén, 2006). Missing data for any variable in both studies were < 2% (Study 1 missing maximum = 1.2%, average = 0.23%; Study 2 missing maximum = 1.8%, average = 1.22%). For the WLSM Mplus does not impute values for those that are missing, rather data that are available are used to estimate the model.

In line with the recommendations from the literature (e.g., Jöreskog, 1993) a sequential model testing approach was adopted to refine the initial measurement model and then confirm it on a separate sample. This method is commonly used in the measurement development literature (see for example, Barlow, Woodman, & Hardy, 2013; Beattie, Hardy, Savage, Woodman, & Callow, 2011; Roberts, Callow, Hardy, Markland, & Bringer, 2008). The sequential model testing approach involved three stages: (1) convergent validity of the items making up each subscale was tested using separate single-factor models. That is, stage 1 examined each of the separate coaching behaviors keeping only those items that were good indicators of the underlying latent variable (cf. Jöreskog, 1993); (2) ambiguous items were identified using two-factor models of each pair of subscales - based upon the diagnostic information from the single-

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factor and two-factor stages, together with conceptual arguments, certain items were deleted from each subscale; (3) the hypothesized 5-factor model was then tested. The 5-factor model was then tested against a series of alternative models that included a 2nd order model where the 5-factors were loaded onto a single higher order factor and a 1-factor model where all the items were loaded onto a single factor. Discriminant validity was tested by examining the 95% confidence interval around the inter-factor correlations (± 1.96 SE). A confidence interval that includes 1.0 would suggest that the factors are perfectly correlated and thus would be evidence of a lack of discriminant validity. The diagnostic information utilized to inform on post hoc model modifications (i.e., the deletion of items) were theoretical, overall model fit, standardised factor loadings (factor loadings > .70 were considered good), and modification indices.

Results

Observation. Based on the diagnostic results three items were deleted from the observation subscale. This resulted in a good fitting single-factor model (χ^2 (2) = 3.09, p > .05; RMSEA = .04; CFI = .1.00; TLI = 1.00). All the standardized factor loadings were greater than .63, p < .01 and coefficient Ω = .81. For all the retained items please see Table 1.

Questioning. Based on the diagnostic results two items were deleted from the questioning subscale. This resulted in a good fitting single-factor model (χ^2 (2) = 0.15, p > .05; RMSEA = .00; CFI = 1.00; TLI = 1.00). All the standardized factor loadings were greater than .73, p < .01 and coefficient Ω = .83.

Goal setting. Based on the diagnostic results one item was deleted from the goal setting sub-scale. This resulted in a good fitting single factor model (χ^2 (5) = 5.74, p > .05; RMSEA = .02;

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CFI = .1.00; TLI = 1.00). All the standardized factor loadings were greater than .72, $p < .01$ and the coefficient Ω = .89.

Developmental feedback. All four items from the developmental feedback scale fitted the data well (χ^2 (2) = 0.40, $p > .05$; RMSEA = .00; CFI = .1.00; TLI = 1.00). All the standardized factor loadings were greater than .82, $p < .01$ and the coefficient Ω = .84.

Motivational feedback. Based on the diagnostic results one item was deleted from the motivational feedback sub-scale. This resulted in a good fitting single factor model (χ^2 (2) = 3.22, $p > .05$; RMSEA = .04; CFI = 1.00; TLI = 1.00). All the standardized factor loadings were greater than .84, $p < .01$ and the coefficient Ω = .90.

The full model also demonstrated good fit to the data (χ^2 (179) = 370.21, $p < .01$; RMSEA = .06; CFI = .98; TLI = .97). The inter-factor correlations between the separate subscales ranged from .76 to .95 (zero order correlations ranged from .63 to .80). This confirms the theorization that the coaching behaviors would all be correlated. The high inter-factor correlations raise a concern regarding the discriminant validity of the subscales. However, examination of the standard errors around the correlations reveals that none of the correlations include unity; therefore, whilst the sub-scales are highly correlated they are distinguishable from each other at a measurement level. We also tested two alternative models, a 1-factor model where all the items load onto 1-factor and a 2nd order model where the latent first order factors load onto a single second order factor. The 1-factor model fitted the data poorest whilst there was no distinguishable difference between the 5-factor and 2nd order model. However, warnings were produced in the output that PSI is not positive definitive for the 2nd order model. This was indicative of a miss-specified model, consequently we concluded that the 5-factor model best

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represents the data. See Table 2 for results of the confirmatory factor analyses and Table 3 for the descriptives and zero order correlations for all the sub-scales. From this point the newly developed scale will be referred to as the military coach behavior scale (MCBS).

Study 2

Study 2 had two main objectives. Firstly to confirm the measurement model obtained in Study 1 on a different sample and secondly to test the predictive validity of the MCBS. In order to test the predictive validity of the scale we selected two performance related outcome variables that can be theorized to be influenced by coaching behaviors. The two variables selected were satisfaction with training and resilience. These dependent variables were chosen to test the predictive validity of our new measure because both these variables have been shown to be important in performance contexts including the military (e.g., Hardy et al., 2011; Judge, Thorson, Bono, & Patton, 2001) and to be influenced by leader behaviors (e.g., Hardy et al., 2011; Judge & Piccolo, 2004; Vecchio, Justin, & Pearce, 2008). Thus they are both well placed to test the predictive validity of our new measure. Study 2 was part of a wider research program; none of the data from the wider research project has been published but may potentially be submitted for publication at a later date.

Participants

A total of 277 SuTs agreed to take part in the study. However, 5 did not provide section level data and were thus removed from data analyses. This gave a sample size of 272 (M^{age} = 21.76, *SD* = 3.72) that were nested in 34 sections for the confirmatory factor analyses. Due to an administrative error only 217 provided age data. The sample for the predictive validity test involved matching up participants that provided data at time 1 with their data at time 2 (5 weeks

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later). A total of 218 questionnaires were successfully matched. 54 participants from the original sample of 272 were unable to be matched due to no longer being in training, unable to attend (e.g., at dentist, physiotherapy), had moved to another platoon, or the identifiers were illegible). Furthermore, of the 218 that were successfully matched, 5 participants failed to put a level 2 identifier on and were removed from the analyses. This gave a sample of 213 SuTs (*M* age = 21.78, SD = 3.71; Male = 211; Female = 2) nested in 33 sections. The sample consisted of mostly British (N = 196) with 7 other nationalities being included (South African, Ghanaian, Gambian, Cameroonian, Kenyan, Botswanaian, and Nigerian). The participants in Study 2 were from exactly the same training context as Study 1.

Measures

Coach Behaviors. The MCBS that was developed in Study 1 was administered. All subscale coefficient Ω for these data were between .87 and .91.

Satisfaction. The measure used in the current study was a validated military satisfaction with training scale that was developed by (Hardy et al., 2010). The scale consists of four items and the response format was a 5-point Likert scale (anchored as 1 = very dissatisfied, 2 = dissatisfied, 3 = neutral, 4 = satisfied, and 5 = very satisfied). An example item is “I get a lot of satisfaction from training.” This scale has been shown to have good psychometric and predictive validity in a military context (e.g., Hardy et al., 2010).

Resilience. Resilience has been defined as the role of mental processes and behavior in promoting personal assets and protecting an individual from the potential negative effect of stressors (Fletcher & Sarker, 2012). In line with this definition, resilience was operationalized as the ability to maintain confidence in the face of setbacks and disconfirming experiences. The

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measure developed by Hardy et al. (2010) in a military setting was used here. The scale consists of 4 items with the stem being, "compared to the most confident recruit you know, how would you rate your confidence in your ability to…" An example item is "Bounce back from performing poorly and succeed". However, we replaced one item from the original Hardy et al., scale "Be consistently successful week-on-week" with "Bounce back from back-trooping and succeed" because the latter item better represented the resilience component of 'bouncing' back from failure than the former. The response format was a 5-point Likert scale (anchored at 1 = low, 3 = medium, and 5 = high).

The dependent variable measurement model displayed an adequate fit to the data χ^2 (19) = 47.53, $p < .01$; RMSEA = .08; CFI = .98; TLI = .97. Furthermore, the subscale coefficients Ω were .76 and .81 for resilience and satisfaction respectively.

Procedure

The same procedures that were used in Study 1 were applied. However, because we needed to match up questionnaire data that were collected at two different time points we also needed to collect unique identifiers, namely the SuT service number. Consequently, the brief provided in Study 1 was altered to explain why such identifiers were needed. The MCBS was administered in week 7 and satisfaction and resilience were administered in week 13.

Data Analysis

Please refer to the sequential model testing approach adopted in Study 1. Further information for the specific analyses undertaken are integrated within the results section.

Results

Model Factor Analyses

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The confirmatory factor analyses in a different sample supported Study 1 with the single factor measurement models fitting the data well for questioning χ^2 (2) = 5.26, $p > .05$; RMSEA = .08; CFI = 1.00; TLI = .99; goal setting χ^2 (5) = 6.26, $p > .05$; RMSEA = .03; CFI = 1.00; TLI = .99; developmental feedback χ^2 (2) = 4.52, $p > .05$; RMSEA = .07; CFI = 1.00; TLI = 1.00; and motivational feedback respectively χ^2 (2) = 0.49, $p > .05$; RMSEA = .00; CFI = 1.00; TLI = 1.00. However, the single factor model for observing demonstrated a less than adequate fit to the data χ^2 (2) = 16.49, $p < .01$; RMSEA = .16 but the CFI = 1.00 and TLI = 1.00 were both well within accepted levels. Furthermore, the coefficient omega for the observation scale was also very good .91 and standardized factor loadings were all > .83. The coefficient omega for the other scales were all above .86 (see Table 1 for factor loadings and coefficient omega).

The full model demonstrated a good fit to the data χ^2 (179) = 354.15, $p < .01$; RMSEA = .06; CFI = .98; TLI = .97. The inter-factor correlations ranged from .71 to .95 (zero order correlations ranged from .64 to .83). Again these correlations are high. However, it is important to note that the standard errors around the inter-factor correlations did not include unity. This indicated that the sub-scales, whilst are highly correlated (as is expected), were distinguishable at a measurement level. We also tested two other models, namely a 1 factor model where all the items load onto 1 factor and a second order model where the subscales load onto a second order coaching variable. The 1 factor was the poorest fitting model with no distinguishable difference between the 4-factor and the 2nd order models. See Table 2 for the CFA results and Table 3 for the descriptives and zero order correlations for the sub-scales. Based on the findings of Study 1 we concluded that the 5-factor model best represents the data.

Predictive Validity

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The correlation analyses revealed that all the coaching behaviors were positively related to the all of the outcome variables; see Table 3 for all the correlations. However, the data is nested within leader, consequently multilevel analyses were used to control for the nested nature of the data. To this end, we used MLwiN V. 2.1 (Rashbash, Charlton, Browne, Healey, & Cameron, 2009). Prior to conducting the analyses all the variables were group mean centered. The ICC for satisfaction and resilience are .15 and .00, respectively. Interestingly the ICC for resilience was very low suggesting that there was very little group level variation in resilience. However, multilevel analyses were still deemed appropriate for use with this variable as the assumption of non-independence of measures was violated in this data because several individuals rated the same leader's behaviors. The results of the logliklihood ratio tests revealed that a random intercept-random slope model did not fit the data significantly better than the random intercept-fixed slope models on all but two of the models, namely, observation on satisfaction (χ^2 (2) = 10.5, $p < .05$) and effective questioning on satisfaction (χ^2(2) = 13.69, $p < .05$). Consequently, random intercept-random slope models were specified for the analyses involving observation and effective questioning predicting satisfaction. All the other models were specified as random intercept-fixed slope models. The multilevel analyses (see Table 4) demonstrated that all of the coaching behaviors were significantly related to the dependent variables that were measured 5 weeks later, indicating good predictive validity of the MCBS.

Discussion

In an attempt to facilitate greater cross-fertilization of knowledge across disparate coaching silos, this paper presents the findings of two studies conducted to test a model of coaching behaviors in a sample of SuTs. That is, our intention was to delineate and deconstruct

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the complexity surrounding the coaching context and revive the fundamental examination of coaching behaviors. Following an extensive review of the literature we highlighted five practice activities that epitomize what high-performance coaches do: observing and performance analysis, asking effective questions, facilitating goal setting, and providing developmental feedback, and motivational feedback. Subsequent scale development procedures resulted in the 28-item MCBS for which confirmatory factor analyses demonstrated the full model to be a good fit to the data in two samples of SuTs. The MCBS was also shown to have strong predictive validity by predicting satisfaction and resilience that were measured 5 weeks later.

Overall, the MCBS displayed good psychometric properties over the two studies, but the subscale of observation displayed a less than desirable chi square and RMSEA values in study 2. We are unsure exactly why this subscale displayed questionable fit statistics in study 2. Nevertheless, a closer inspection of the items revealed items 1, 2 and 3 to appear to be measuring only observation of performance whereas item 4 extends beyond just observing to include some sort of qualitative evaluation of the performance. That is, the word '*analyses'* implies an evaluative component that goes beyond merely observing. Indeed, supplementary analyses on a single factor model on items 1, 2, and 3 showed the fit statistics to be within acceptable range (i.e., non- significant chi-square). For scale completeness we decided to retain item 4 but recommend that further testing of this subscale is required. This issue raises an interesting conceptual question about whether a component of performance evaluation that is more in-line with performance analysis should be included in the coaching model. In line with Carron, Brawley, and Widmeyer's (1998) suggestion that measurement validation is an on-going process we feel that this issue warrants future research.

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There are several limitations of the present work. Our primary aim was to develop and provide initial psychometric testing of our model, and in doing so we controlled for the clustered nature of our data. Indeed, while we controlled for group level (i.e., level 2) effects in our statistical analysis, we did not model them per se. Hence, researchers undertaking further examination of the MCBS might undertake these valuable next steps and incorporate such level 2 variables into modelling using multi-level structural equation modelling. Further, we acknowledge that some researchers favor a more elaborate initial item development procedure (e.g., a stage-based Delphi approach), which might assist in the justification of face validity claims, but which was not undertaken here, and as such we would encourage researchers to examine the relative efficacy of different approaches to item development. Indeed, while we have achieved our goal of development and initial validation, we would welcome further factor testing of the MCBS in order to extend our confidence in its utility for research and applied practice.

The research presented here has several strengths. First, data were collected from two samples as part of rigorous development and validation procedures to create a measure of empirically-derived coaching behaviors. Second, sophisticated statistical techniques, such as confirmatory factor analyses and multilevel analyses, were used to examine the validity of the MCBS whilst considering the nested nature of the data. Third, the findings presented here suggest that the measure has good predictive validity for two salient performance variables in organizational settings; resilience and satisfaction.

It should be noted that it was our intention to set the foundations for the MCBS in coaching behaviors rather than attempt to provide an all-encompassing model of the coach

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context which incorporates numerous interacting and mediating variables (see, for reviews, Becker, 2012; Cote et al., 2010; Cushion, 2010). Indeed, we hope that the conceptual model and measure presented here are perceived as a compliment to extant holistic social cognitive models of coaching, whilst offering an extension to this literature by developing and taking significant steps toward validating the MCBS in an alternative high-performance domain. Whilst we would acknowledge that there are inherent limitations of measuring just one aspect of the coaching context, we perceive the potential benefits of such measures to far outweigh these. For example, the MCBS offers individuals direct feedback on their behaviors, as perceived by those they coach. For this reason, the MCBS has the potential to be a valuable tool to measure coaching behaviors for use in both research (e.g., conceptual and theoretical refinement) and applied practice (e.g., education, training, assessment).

In conclusion, the MCBS reflects a useful instrument to measure and discriminate between high-performance coaching behaviors. Although the findings of the programme of work presented here provides support for the adequacy of the MCBS's psychometric properties and the conceptual model on which it is based, further work is required to validate the measure in relation to diverse performance indicators (e.g., coaching effectiveness, individual, team and organizational performance), domains (e.g., sport, education, workplace organizations) and consider the cross-cultural validity and underlying factor structure of the measure. The MCBS will also enable for an empirical investigation of the efficacy of employing coaching related interventions.

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Table 1.
Standardized factor loadings of the items on their designated factor, and coefficient omega for the scales in study 1 and study 2

											Omega	
Study	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**
Observation											.81	.91
1. Pays close attention to what I do	.73	.86										
2. Carefully observes my skills	.81	.86										
3. Careful watches me doing the skills and drills	.82	.88										
4. Analyzes my performance	.68	.89										
Effective Questioning											.83	.87
1. Encourages me to think about how I can improve my performance			.80	.89								
2. Encourages me to question the way I do things			.72	.78								
3. Encourages me to make suggestions on how I can improve my performance			.84	.85								
4. Asks my opinion on how I can improve my performance			.78	.82								
Goal Setting											.89	.90
1. Monitors my progress toward my goals					.80	.85						
2. Helps me set short term goals					.80	.78						
3. Helps me identify targets for attaining my goals					.80	.81						
4. Helps me set long term goals					.84	.83						
5. Provides support to help attain my goals					.83	.91						
Developmental Feedback											.84	.90
1. Makes sure I understand what I need to do to improve							.84	.86				
2. Gives me advice on how to improve my skills							.89	.91				
3. Offers advice on what I need to do to improve							.87	.85				
4. Shows me how to improve my skills							.81	.87				
Motivational Feedback											.90	.91
1. Tells me when I do a particularly good job									.86	.87		
2. Sees that I am rewarded for good performance									.89	.87		
3. Expresses appreciation when I perform well									.92	.90		
4. Gives me credit where credit is due									.80	.83		

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Table 2.
Confirmatory factor Analyses for Study 1 and 2

Model		χ^2	CFI	TLI	RMSEA	Loadings
Five factor	Study 1	379.26**	0.98	0.97	0.06	.68-.92
model	Study 2	354.15**	0.98	0.97	0.06	.78-.91
One factor	Study 1	833.87**	0.93	0.92	0.10	.60-.84
model	Study 2	600.88**	0.95	0.94	0.09	.74-.87
Second-order	Study 1 [a]	372.52**	0.98	0.98	0.06	.98-.92
model	Study 2	342.60**	0.98	0.98	0.06	.78-.99

Note: ** p < .01. This model had warning errors associated with it and consequently the results should be interpreted with caution. For comparison, we also conducted an ESEM on the data, which revealed largely similar results to the CFA, with the exception of a reduced chi-square value: Study 1 (X^2 (115) = 171.62, p < .01; RMSEA = .04; CFI = .99; TLI = .98); Study 2 (X^2(115) = 169.09; RMSEA = .04; CFI = .99; TLI = .99).

Table 3.
Means, standard deviations, and correlations for Studies 1 and 2. Study 1 correlations are displayed on lower matrix and Study 2 correlations are displayed on the upper matrix

	Study 1		Study 2						
	Mean	SD	Mean	SD	1.	2.	3.	4.	5.
1. Observation	3.75	0.77	3.59	1.00	-	.73	.72	.74	.64
2. Questioning	3.34	0.89	3.28	1.00	.70	-	.82	.83	.77
3. Goal setting	3.26	0.96	3.21	1.01	.63	.80	-	.80	.73
4. Develop. Feedback	3.73	0.91	3.69	0.96	.66	.79	.75	-	.73
5. Motivational Feedback	3.04	1.07	2.94	1.04	.63	.70	.68	.64	-

Note. All correlations are significant to p < .01

Table 4.
Multilevel analyses for the coaching behaviors with resilience and satisfaction

	Satisfaction			Resilience		
	Intercept B_{0ij}	B	SE	Intercept B_{0ij}	B	SE

Questioning B_1	4.37	.221**	.042	3.96	.214**	.055
Group Level Variability B_1		.046	.042		.007	.102
Individual Level Variability		.131**	.043		.448**	.111
Observation B_1	4.36	.172**	.042		.229**	.055
Group Level Variability		.035	.048		.000	.000
Individual Level Variability		.167**	.051		.451**	.044
Goals B_1	4.36	.146**	.039	3.96	.200**	.054
Group Level Variability		.020	.054		.022	.103
Individual Level Variability		.219**	.057		.435**	.111
Developmental Feedback B_1	4.36	.198**	.042	3.96	.304**	.057
Group Level Variability		.004	.052		.005	.097
Individual Level Variability		.227**	.056		.425**	.105
Motivational Feedback B_1	4.35	.162**	.039	3.96	.201**	.054
Group Level Variability		.000	.000		.000	.000
Individual Level Variability		.235**	.023		.457**	.044

Note. * $p < .05$, ** $p < .01$
Please note that based on logliklihood tests random intercept random slope models were specified in the analyses involving observation and effective questioning predicting satisfaction. In all the other analyses random intercept fixed slope models were specified.

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