ANTECEDENTS OF FLOW AND THE FLOW-PERFORMANCE RELATIONSHIP IN CRICKET

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Original scientific paper
https://doi.org/10.26582/k.50.2.6
UDC: 796.358:159.9

Abstract:

The present study aspires to elaborate on the conceptual framework of flow by further elucidating integration and conceptualization of a relationship between flow and objective and subjective measures of performance. The aims of the study were twofold: (1) to examine the relationship between flow and its key correlates: anxiety, motivation, and perceived ability; (2) to assess whether the relationship between these measures and performance is direct or mediated. Participant sample included a group of cricketers with varying performance level (n = 40) and a group of 20 non-cricket team athletes; all were between 18 and 35 years of age. Their performance was assessed objectively by batting average, along with administering the Dispositional Flow Scale (DFS), Sport Anxiety Scale (SAS), Sport Motivation Scale (SMS), and Perceived Sport Ability (PSA) questionnaires. Results show that the three flow correlates accounted for 77% of dispositional flow variance; individual correlates varied, however, in their predicting power, anxiety: 0%; motivation: 1%; perceived ability: 57%. In addition, total flow and flow correlates accounted for a total of 54% of variance in performance, whereas unique variance of 8% was accounted for by anxiety and perceived ability, each. Notably, flow and two correlates, anxiety and perceived ability, were found to have a direct impact on performance; in contrast, a weak partial mediation of flow was found between motivation and performance. Based on the findings on the flow-performance relationship, expansion of the flow theory is suggested; benefits for advancing intervention research in sport psychology are discussed.

Key words: *optimal experience, anxiety, motivation, perceived ability, mediation*

Introduction

The flow model by Kimiecik and Stein (1992) proposed a number of key personality variables underlying the experience of flow in sports. Contentions of conceptual links indicated positive relationships between flow and intrinsic motivation, perceived ability, and negative relationships with anxiety (Kimiecik & Stein, 1992). Although a number of studies found support for a number of dispositional variables being correlates of flow (e.g., Jackson, Kimiecik, Ford, & Marsh, 1998; Jackson, Thomas, Marsh, & Smethurst, 2001; Koehn, Morris, & Watt, 2013), one shortcoming of the model is the omission of performance and clear conceptual integration of performance into the flow framework. The purpose of the study was to examine main tenets of flow theory and to assess the flow-performance relationship in a mediation model.

Flow has been conceptualised (Jackson, 1996) and operationalised (Marsh & Jackson, 1999) as a nine dimensional construct, consisting of challenge-skills balance (CSB), action-awareness merging (AAM), clear goals (CG), unambiguous feedback (UF), concentration on the task at hand (CTH), sense of control (SC), loss of self-consciousness (LSC), time transformation (TT), and autotelic experience (AE). Csikszentmihalyi (1975) suggested a perceived balance between situational challenges and personal skills is a necessary precondition to experience flow, whereas an imbalance can either lead to negative experiences, such as anxiety, which is antithetical to flow. Jackson and Csikszentmihalyi (1999) indicated that the skill level is particularly important, because the honing of strong skills is likely to lead to positive performance experiences (e.g., winning or playing well), independent of current challenges. Jackson et al. (1998) found some support for the negative relationship between anxiety and flow, and a positive association between intrinsic motivation and perceived competence, a construct conceptually related to confidence which appears central for

high skill perceptions, and dispositional flow. All associations showed significant small-to-moderate correlations (Jackson, et al., 1998).

The flow model does not explicitly conceptualise the relationship between flow and performance, but Kimiecik and Stein (1992) advocated that frequent flow experiences should enhance athletes' performance. Jackson et al. (2001) found significant relations between flow state and subjective and objective performance (errors, finishing position) measures. Extending this line of research, Koehn and Morris (2012) examined this association in a sample of 188 junior tennis players. The results generally supported the positive association between flow and performance perceptions. Comparing winners and losers on flow, binary logistic regressions showed that some flow characteristics were stronger for successful athletes. From an applied point of view, previous intervention studies aimed to enhance both athletes' flow experiences and performance by using an imagery-based procedure (e.g., Koehn, Morris, & Watt, 2014; Pates, Karageorghis, Fryer, & Maynard, 2003). These case studies found a general increase in flow and performance after the intervention, and athletes also reported a stronger sense of confidence in the validation interview. Research provided evidence for positive relationships between flow and performance (e.g, Jackson, et al., 2001; Koehn & Morris, 2012), and between flow correlates of anxiety and confidence and performance (for a review and meta-analysis see Craft, Magyar, Becker, & Feltz, 2003). Baron and Kenny (1986) advocated that a mediation model needs to be tested if the precondition of substantial relationships between predictor and criterion variables is met. On the basis of empirical and statistical considerations we hypothesised that flow is a potential mediator between flow correlates and performance.

Empirical results supported conceptual considerations that motivation, perceived ability, and anxiety underlie athletes' flow experience (Jackson, et al., 1998; Koehn, et al., 2013). Particularly Jackson and colleagues (1998) closely followed suggestions of general (Csikszentmihalyi, 1975) and sport-specific (Kimiecik & Stein, 1992) flow contentions. In this study we are aiming to re-examine the findings by Jackson et al. (1998), before extending research on the flow-performance relationship.

Previous research frequently used cross-sectional designs in order to test direct, linear associations between flow and a number of flow antecedents (Jackson, et al., 1998, 2001; Koehn, et al., 2013) and between flow and performance (Jackson, et al., 2001; Koehn & Morris, 2012). Despite these efforts, however, there is little evidence on the flow-performance relationship in team sports and whether indirect effects may be present when testing flow and performance. Therefore, mediation analysis would provide additional information on direct or indirect effects on the flow-performance relationship in sports. The aims of the study were twofold: (1) to examine the relationship between flow and its key correlates: anxiety, motivation, and perceived ability; (2) to assess whether the relationship between these measures and performance is direct or mediated.

Methods

Participants

The sample consisted of 60 male athletes, 18-35 years of age (M = 24.43; SD = 3.63). Participants competed in team sports, including cricket and football. All participants had been involved in their sports for at least two years and had extensive training and competition experience (M = 7.86; SD = 4.38). For this first aim (i.e., to examine the relationship between flow and its key correlates, anxiety, motivation, and perceived ability), all participants were included in the analyses. Football (n = 20) and cricket (n = 40) players had achieved a moderate to high skill level, but only the cricket players' performance could be examined objectively (i.e., to assess whether the relationship between these measures and performance is direct or mediated). Cricket players had a batting average of 23.04 (SD = 9.52) with a minimum of 10.60 and a maximum of 37.30.

Measures

Dispositional Flow Scale (DFS; Marsh & Jackson, 1999). The DFS assesses the frequency of flow and consists of 36 items representing nine subscales, each comprising four items. Thus, the nine subscales represent the nine dimensions of flow: challenge-skills balance (CSB), action-awareness merging (AAM), clear goals (CG), unambiguous feedback (UF), concentration on the task at hand (CTH), sense of control (SC), loss of self-consciousness (LSC), time transformation (TT), and autotelic experience (AE). The response format is a 5-point Likert scale anchored by 1 (*never*) and 5 (*always*). The subscales showed acceptable Cronbach's alpha values, ranging between .70 and .88 (Jackson, et al., 1998). Previous research has frequently used the DFS (e.g., Jackson, et al., 1998, 2001).

Sport Anxiety Scale (SAS; Smith, Smoll, & Schutz, 1990). The SAS is a trait measure, which was employed to assess athletes' anxiety levels during previous performances. The SAS consists of three subscales, labelled concentration disruption, worry, and somatic anxiety with five items per subscale. Responses are given on a 4-point Likert scale, ranging from 1 (*not at all*) to 4 (*very much so*).

Sport Motivation Scale (SMS; Pelletier, et al. 1995). The SMS consists of a unidimensional measure of amotivation and multidimensional measures of intrinsic and extrinsic motivation. The

subscales are subdivided into measures of intrinsic motivation to know, intrinsic motivation to accomplish, and intrinsic motivation to experience stimulation, and extrinsic motivation is assessed through subscales labelled identified, introjected, and external regulation. Each item is addressed based on the stem *Why do you practice your sport*? Each subscale includes four items; responses are provided using a 7-point Likert scale, anchored by 1 (*does not correspond at all*) and 7 (*corresponds exactly*).

Perceived Sport Ability (PSA; Lee, 1999). The PSA is a 5-item unidimensional measure assessing athletes' perception of their skills. Response format is a 7-point Likert scale, anchored by 1 (*strongly disagree*) and 7 (*strongly agree*). Overall score ranges between 5, indicating athletes' perception of their low performing ability, and 35 indicating that they consider they can perform very well. The final item "I can't play the sport very well" is reverse-scored.

Performance. Performance was assessed for a subsample of cricket players (n = 40). Athletes' batting average was employed as an objective measure of performance. This information has been retrieved from public records on the cricket county championships. The batting average per match was 23.04.

Procedure

Following approval from the local University's Ethics Committee, athletes from the North-West England were approached to participate in this study. Participants were selected based on a minimum of two-year involvement in team sports. Information statements and consent forms were handed out to coaches who passed on the information statements and consent form to their players. All participants who volunteered and provided informed consent, completed the various questionnaires at their home venue and returned the completed scales to the second author. All participants received oral and written information regarding the measures. These included instructions on their general experience in their sports and participants should reflect on the same time period when completing the various scales.

Statistical procedures

This study used a cross-sectional design. A relationship between dispositional flow, its correlates: anxiety, motivation, perceived ability, and performance was explored employing Pearson product moment correlational coefficients, regression analyses and mediational analyses. The power analysis, based on the calculations by Cohen (1988), indicated that with a sample size of 60 participants there is a 78% chance to find significant correlations on a moderate level.

Examining mediation effects, Baron and Kenny (1986) have suggested that the assessment of three paths is crucial in detecting potential mediators, that is, (i) if changes in the independent variable account for changes in the mediator (Path a); (ii) whether changes in the mediator account for changes in the dependent variable (Path b); and (iii) if the association between the independent and the dependent variables changes from a significant (Path c^1) to a non-significant (Path c^2) relationship when the independent variable is controlled for by the mediator. Baron and Kenny (1986) proposed a full meditation model, i.e., when Path c^2 shows almost zero correlation, then the notion of a sole dominant mediator is tenable, whereas a partial mediation model, i.e., when Path c^2 is still significant but weaker than Path c^1, indicates that more than one mediator affects the relationship between independent and dependent variables.

Statistically, we employed the approach described and used by Short, Tenute, and Feltz (2005) in order to test a three-path mediation model. Short et al. (2005) proposed four steps to assess mediation effects, including regression analysis between the independent and mediation variables (step 1), between independent and dependent variables (step 2), and "finally, hierarchically regressing the dependent variable on the mediator and then on the independent variable" (p. 956) (steps 3, 4).

Results

Reliability

Cronbach's alpha coefficients were acceptable for the DFS (.98), SAS (.85), SMS (.84), and PSA (.95). At a subscale level, Cronbach's alpha indicated high values for DFS dimensions, anxiety subscales, and two (out of seven) motivation subscales (Table 1).

A relationship between flow, correlates of flow, and performance

As shown in Table 1, the relationship between flow dimensions and correlates of flow generally signified (i) a negative relationship with anxiety variables and amotivation, (ii) a strong positive relationship with perceived ability, and (iii) moderately strong association with intrinsic motivation characteristics. At a global level, the correlation coefficients between flow and flow correlates showed moderate-to-strong values ranging from r = -.39 (anxiety), r = .36 (motivation), to r = .87 (perceived ability). Correlations with performance varied between r = .41 (flow), r = .57 (motivation), r = .73 (perceived ability), and r = -.74 (anxiety). The coefficients indicated moderate-to-strong correlations between independent and dependent variables, which met a necessary assumption for the testing of mediation models (Baron & Kenny, 1986).

Table 1. Correlation matrix, means, standard deviations, and Cronbach's α (in brackets) for individual subscales

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1	**Performance**																					
2	**PSA**	.89	(.95)																			
	SMS																					
3	IM to know	.39	.29	(.72)																		
4	IM to accomplish	.51	.51	.71	(.78)																	
5	IM to experience	.55	.53	.64	.66	(.66)																
6	EM identified	.41	.39	.64	.69	.57	(.61)															
7	EM introjected	.28	.27	.54	.58	.63	.60	(.59)														
8	EM external	.47	.31	.56	.66	.59	.47	.59	(.68)													
9	Amotivation	-.26	-.16	-.54	-.55	-.53	-.52	-.32	-.41	(.63)												
	SAS																					
10	Somatic	-.45	-.38	-.38	-.40	-.30	-.34	-.30	-.35	.39	(.83)											
11	Conc. Disruption	-.56	-.50	-.26	-.36	-.17	-.13	-.13	-.34	.17	.60	(.76)										
12	Worry	-.36	-.18	-.30	-.19	-.26	-.18	-.12	-.35	.15	.37	.39	(.76)									
	DFS																					
13	CSB	.74	.82	.09	.38	.33	.20	.14	.22	.01	-.23	-.38	-.05	(.92)								
14	AAM	.84	.85	.18	.45	.44	.31	.19	.31	-.13	-.32	-.47	-.19	.92	(.94)							
15	CG	.81	.87	.14	.31	.34	.23	.16	.26	-.07	-.38	-.51	-.16	.79	.84	(.89)						
16	UF	.76	.83	.17	.34	.29	.26	.13	.28	.01	-.34	-.50	-.13	.80	.80	.88	(.92)					
17	CTH	.67	.79	.15	.33	.23	.22	.08	.20	.03	-.27	-.45	-.08	.78	.78	.85	.88	(.84)				
18	SC	.84	.87	.15	.40	.39	.25	.18	.30	-.05	-.35	-.52	-.16	.94	.96	.87	.86	.81	(.97)			
19	LSC	.65	.70	.18	.36	.38	.31	.19	.30	-.13	-.35	-.42	-.20	.70	.76	.71	.69	.75	.77	(.94)		
20	TT	.52	.60	.09	.41	.16	.23	.14	.22	-.05	-.23	-.28	-.04	.65	.62	.55	.62	.71	.66	.69	(.83)	
21	AE	.47	.61	-.04	.23	.23	.11	.15	.17	-.01	-.12	-.32	-.08	.72	.63	.66	.68	.71	.70	.71	.63	(.85)
	M	15.36	5.26	5.08	5.13	5.08	5.15	5.00	4.66	3.16	1.64	1.86	2.24	3.93	3.81	3.93	4.10	3.99	3.90	4.07	3.78	3.97
	SD	13.41	1.57	0.80	0.76	0.84	0.67	0.83	1.04	0.94	0.51	0.51	0.56	1.04	1.05	0.90	0.92	0.81	1.18	0.94	0.80	0.87

Note. Scores ≥ .26 are significant at $p = .05$; scores ≥ .33 are significant at $p = .01$; scores ≥ .44 are significant at $p = .001$. PSA = Perceived Sport Ability; SMs = Sport Motivation Scale; SAS = Sport Anxiety Scale; DFS = Dispositional Flow Scale; IM = intrinsic motivation; EM = extrinsic motivation; CSB = challenge-skills balance; AAM = action-awareness merging; CG = clear goals; UF = unambiguous feedback; CTH = concentration on the task at hand; SC = sense of control; LSC = loss of self-consciousness; TT = time transformation; AE = autotelic experience.

Unique variance explained in flow

We employed a hierarchical regression analysis, following the methodology proposed by Short et al. (2005), in order to examine the unique amount of variance explained by the various predictors of flow (aim 1) and performance (aim 2). Testing unique variance among predictors of anxiety, motivation, and perceived ability, we first entered anxiety into the regression equation, which allowed an overall assessment of explained variance without the interference of the other predictor variables. In the following analysis the same predictor was entered last into the regression equation, providing information on how much unique variance could be explained after all other constructs had been controlled for. This methodology was applied to each correlate. The results showed that all predictors explained a substantial amount of variance in flow when entered into the regression first: 16% (anxiety), 13% (motivation), and 77% (perceived ability). After controlling for the other correlates, the amount of unique variance accounted for in flow was substantially lower for anxiety (0%), motivation (1%), but relatively high for perceived ability (57%). For the second aim of this study, a total of 40 cricket players provided information on

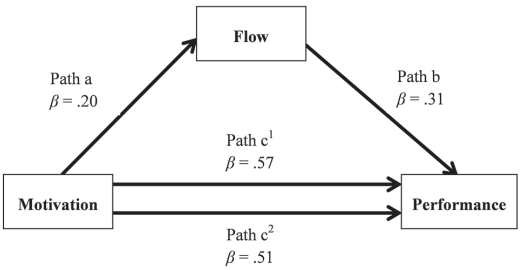

Figure 1. Mediation model between motivation, flow, and performance.

their batting average. Applying the same methodology for performance as the criterion variable, the results varied considerably when predictor variables were entered first (17% flow; 54% anxiety; 33% motivation; 54% perceived ability) or last (0% flow; 8% anxiety; 5% motivation; 8% perceived ability).

Flow as a mediator of performance

The results showed that flow had a direct effect on batting performance (Table 2). A direct effect was also confirmed for the three flow correlates of motivation, perceived ability, and anxiety. Flow was not detected

Table 2. Regression analysis assessing flow as a mediator between its key correlates and performance

Analysis	Criterion	Predictor	*R*	R^2	R^2 adj.	*B*	*SE*	*β*	*t*
SAS									
Equation 1	Flow	Anxiety	.49	.24	.22	-0.40	.12	-.49	-3.45**
Equation 2	Performance	Anxiety	.74	.54	.53	-16.39	2.43	-.74	-6.74***
Equation 3	Performance	Step 1 Flow	.41	.17	.15	11.08	4.00	.41	2.77**
	Performance	Step 2 Flow	.74	.55	.52	1.78	3.42	.07	0.52
		Anxiety				-15.68	2.82	-.71	-5.57***
SMS									
Equation 1	Flow	Motivation	.20	.04	.01	0.14	0.11	.20	1.24
Equation 2	Performance	Motivation	.57	.33	.31	11.12	2.59	.57	4.30***
Equation 3	Performance	Step 1 Flow	.41	.17	.15	11.08	4.00	.41	2.77**
	Performance	Step 2 Flow	.65	.42	.39	8.35	3.45	.31	2.42*
		Motivation				9.93	2.48	.51	4.00***
PSA									
Equation 1	Flow	Perceived Ability	.46	.21	.19	.20	.06	.46	3.18**
Equation 2	Performance	Perceived Ability	.73	.54	.52	8.74	1.32	.73	6.63***
Equation 3	Performance	Step 1 Flow	.41	.17	.15	11.08	4.00	.41	2.77**
	Performance	Step 2 Flow	.74	.54	.52	2.56	3.38	.10	0.76
		Perceived Ability				8.22	1.49	.69	5.51***

Note. *$p < .05$; **$p < .01$; ***$p < .001$.

as a mediating variable for anxiety and perceived ability, although a weak partial mediation effect was found between motivation and performance.

Discussion and conclusions

The main aims of this study were to examine anxiety, motivation, and perceived ability as correlates of flow (aim 1), and flow as a potential mediator between flow correlates and performance (aim 2). This study closely followed theoretical contentions by Kimiecik and Stein's (1992) flow model and methodologies previously used by Jackson and colleagues (1998). The findings provided support for the relationship between flow and its correlates. Particularly strong correlations between flow and perceived ability and between performance and anxiety and perceived ability can raise concerns about multicollinearity and potential suppressor effects (Hair, Black, Babin, & Anderson, 2010). In order to detect potential issues, we conducted multicollinearity analyses with flow as the criterion variable (aim 1 of the study) and batting average as the criterion variable (aim 2 of the study), and a hierarchical regression analysis to examine the unique variance explained by each variable.

Further testing of the main psychological variables were based on three specific criteria. First, independent variables need to show moderate-to-strong associations with dependent variables. Pedhazur (1982) suggested that a minimum correlation of .30 should exist for meaningful interpretations of relationships. Second, variable reliability need to be at satisfactory levels. Third, multicollinearity analyses need to indicate acceptable values of collinearity statistics. Hair et al. (2010) proposed cutoff values for tolerance at .10 and a cutoff score of 10 for the variance inflation factor (VIF). The tolerance score reflects a minimum value; an increase in tolerance value indicates a smaller degree of collinearity, whereas the VIF represents a maximum score (Hair, et al., 2010). Reliability and correlation results suggested that assessments at a global rather than a subscale level would be preferable. With flow as the criterion variable, the tolerance value for the correlates ranged from .70 to .77 and the VIF score from 1.31 to 1.43. With batting performance as the criterion variable, the DFS, SAS, SMS, and PSA showed tolerance scores between .54 and .72, and VIF scores between 1.29 and 1.93. On the basis of the sum of these findings, global measures of flow, anxiety, motivation, and perceived ability were retained for further analysis.

Flow correlates shared a large amount of common variance, but only revealed a small amount of unique variance in the prediction of flow. This finding generally confirms results by Jackson et al. (2001), although perceived ability still accounted for 57% of the unique variance, which makes it a key variable underlying flow. Jackson et al. (1998), who also looked into antecedents of flow, argued that anxiety would prevent the experience of flow, stipulating a negative association between anxiety and flow. In addition, the previous research findings (e.g., Jackson, et al., 1998) and theoretical suggestions (Csikszentmihalyi, 1975; Kimiecik & Stein, 1992) indicate that anxiety is not only a consequence but also an antecedent of flow. In this context we assessed anxiety as an antecedent of flow state. Interestingly, the results of this study only partly supported theoretical propositions that anxiety was significantly associated with flow, providing additional evidence for the results by Jackson and colleagues (1998), but no significant mediation effect emerged between anxiety, flow, and performance. It appears that anxiety is not only a consequence of flow, as suggested by Csikszentmihalyi (1975) as a function of a mismatch between challenges and skills, but anxiety is also an antecedent, which showed significant associations with flow and performance (Table 2).

The second aim of the study showed a weak evidence for the flow mediation model between correlates and performance. Support has been found for direct effects on performance, providing further evidence for the positive flow-performance relationship and that predictors of flow also functioned as performance predictors. The correlation results showed that independent variables shared substantial amounts of variance in their relationship to flow and performance. Although the mediation results were rather weak, the findings showed that each of the tested variables had a direct impact on performance. These results add more evidence to previous assessments by Jackson et al. (2001) and Koehn and Morris (2012). A small mediation effect emerged between motivation, flow, and performance, indicating that flow partially mediated this relationship. This may be due to the factor that flow is closely conceptually linked to intrinsic motivation, and, therefore, both constructs may share substantial amount of variance.

Several limitations could have affected the results of this study. The first one is the design that could have masked the strength of some of the relationships. Although this study closely followed a theoretical framework, aligned the previously used methodologies with the current one, and assessed the potentially negative impact of multicollinearity, the results might have been affected by a suppressor effect. Particularly the cross-sectional study design could have contributed to this finding, leading to a greater shared variance between the constructs. A prospective study design and testing on a state rather than a dispositional level could have minimized suppressor effects. Performance measurement was not a part of the self-assessment of participants' evaluations, and hence common-method vari-

ance should not have affected the results. Perceived ability appeared to be a very dominant variable in predicting flow and performance. Given the conceptual similarities between perceived ability and confidence, future studies should focus on this construct when conducting research on flow and performance. The second limitation is related to the sample characteristics. The inclusion of team rather than individual athletes might have limited the detection of relevant flow processes, given the immediacy with which individual athletes experience performance in their sports compared to team athletes. Although evidence was found for an association between team flow and performance (Bakker, Oerlemans, Demerouti, Bruins Slot, & Karamat Ali, 2011), future research should evaluate and compare flow levels in individual and team sports and how it effects performance in both settings. Flow in team events could have minimized the mediation effect, and it is possible that sport setting, i.e., individual versus team sports, is a potential moderating factor in the experience of flow.

The third limitation is related to the testing of alternative, such as equivalent vs. non-equivalent, models. We developed this specific mediation model on theoretical grounds and research findings. Although alternative mediation models can be contrasted statistically, and a "significant test of mediation may provide support for all of these models equally, it does not provide support for one model over the other" (Little, Card, Bovaird, Preacher, & Crandall, 2007, p. 214). Testing various models would go beyond the aim, design, and scope of this study. Nonetheless, conducting model comparisons in the context of mediation analysis would be a fruitful way forward to assess the relationship between flow and performance in more depth and potential directional relationships. This would require the formulation of specific aims in conjunction with a complex design, and the development of models that are strongly based on theoretical contentions in order to test different predictive chains (Little, et al., 2007).

The study provided relevant information in regard to practical applications for coaches, practitioners, and sport psychologists. A number of studies used imagery interventions to increase both flow and performance (Pates, et al., 2003; Koehn, et al., 2014), which were partly based on quantitative approaches, using questionnaire-based data from cross-sectional studies (Koehn, et al., 2013). Similarly to this study, the current findings could help develop flow interventions in team sports that incorporate motivational elements. Based on the imagery model by Hall, Mack, Paivio, and Hausenblas (1998), the use of motivational imagery, such as motivational general mastery incorporating images of confidence, should have a positive effect on athletes' flow experience and performance. Future studies incorporating team rather than individual athletes could shed more light into the relationship between motivation, flow, and performance.

In conclusion, the association between flow and performance is intriguing and more research needs to be devoted to this particular relationship, given the positive reciprocity between positive experience and successful performances. The findings provide support to extent research on a conceptual and applied level. The direct impact of anxiety, motivation, and perceived ability, alongside flow, on performance can point to new research avenues to improve performance. Extensions to Kimiecik and Stein's (1992) flow model seem to be tenable, particularly the conceptual addition of performance. A number of imagery interventions indicated that an increase in flow also enhances performance (e.g., Koehn, et al., 2014; Pates, et al., 2003). Empirical results of cross-sectional studies can feed into the development of intervention programs, as outlined by Koehn and colleagues (2013, 2014). A tailored intervention that aims to enhance athletes' flow experience, motivation, and perceived ability, and reduces anxiety could provide a strong methodological approach to increase cricket performance.

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Submitted: October 5, 2016
Accepted: April 24, 2018
Published Online First: July 13, 2018

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