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Flow Experiences across Multiple Performance Domains

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ABSTRACT

As the construct of flow is currently under revision, the nine dimensions of the Jackson-Marsh Model of flow have been examined more closely. The current study aims to add to this examination by comparing these dimensions across four performance domains: academic, individual sport, spectator sport, and team sport. Participants completed two different flow assessments within one hour following their specified performance activity. One of the assessments measured state specific flow (FSS-2, Jackson & Marsh, 1996). A total of 118 performers participated: academic (n = 26), individual sport (n = 26), spectator sport (n = 32), and team sport (n = 34). Multivariate analysis of variance analyses conducted on the dimensions that represent antecedents of flow (challenge to skills match, clear goals, and unambiguous feedback) revealed less unambiguous feedback for the exam takers (academic) in comparison to the individual sport athletes, spectator sport athletes, and team sport athletes. A multivariate analysis of variance was then conducted comparing dimensions of the experience of flow between activity types. Individual sport athletes experienced higher levels of merging of action and awareness while spectator sport athletes experienced less loss of self-consciousness between the performance domains. Implications of these differences for the flow construct are discussed.

Keywords: flow, flow antecedents, flow experience, activity type, loss of self-consciousness, autotelic.

FLOW EXPERIENCES ACROSS MULTIPLE DOMAINS

The construct of flow has received substantive attention since it was first described by Csikszentmihalyi in 1975. Flow is the feeling of being completely absorbed in a task with such intense focus that irrelevant stimuli are not noticed, and the task can be performed in a fluid and automatic fashion, feeling almost effortless. This state is typically quite enjoyable and is thought to increase the likelihood of improved performance, making it a much sought after state in many performance domains such as sport and music. Csikszentmihalyi (1975) proposed flow as an answer in his quest to describe the meaning of life and happiness. He based his definition on multiple, rich qualitative studies of individuals participating in a variety of different activities. Csikszentmihalyi outlined nine dimensions associated with flow; challenge-skills balance, merging of action and awareness, clear goals, unambiguous feedback, concentration on the task at hand, sense of control, loss of self-consciousness, transformation of time, and autotelic experience (Jackson & Csikszentmihalyi, 1999; Jackson & Marsh, 1996, 2006). These dimensions were then used to create a model and scale of flow by colleagues Jackson and Marsh in their creation of the Flow State Scale (FSS, Jackson & Marsh, 1996).

The Jackson-Model of flow has been criticized for including dimensions that are not as consistently experienced as a part of flow (Alameda, et al., 2022; Norsworthy, et al., 2021; Swann, et al., 2018). In particular, transformation of time and loss of self-consciousness are not always experienced to the same degree as the other dimensions of flow (Csikszentmihalyi, 1990; Jackson, 1992; Swann, et al., 2018; Swann et al., 2012, Tenenbaum, et al., 1999). After interviewing a sample of elite figure skaters about their experience with flow, Jackson (1992) reported that the majority of them did not report a loss of self-consciousness. This was later supported by Swann and colleagues (2012) systematic review of the flow literature where they found that less than 30% of athletes reported these dimensions as a part of their flow experience. The dimensions of time transformation and loss of self-consciousness consistently showed the lowest factor loadings of all the 9 dimensions on both in the original Flow State Scale (FSS, Jackson & Marsh, 1996) and shortened form of the Flow State Scale (FSS-2, Jackson & Eklund, 2004).

During periods of high concentration, such as flow, information that is not relevant to performance on the task is ignored. If time-tracking is not necessary to the task and, in fact, could distract from performance (ie. distance running), it is likely the performer will have a change in their perception of time simply because they are not attending to it. However, in tasks where time needs to be tracked closely (ie. basketball game) they may not experience a transformation of time. The same applies to self-consciousness. It is likely to be attended to in spectator sports (ie. cheer teams) where the appearance of the athlete to others is important for high performance. This would also explain why Jackson (1992) reported that figure skaters did not report a loss of self-consciousness. In many other activities, such as exam taking and endurance running, how one looks to others is not relevant to task performance and, thus, is not attended to.

Certain sports and activities may lend themselves more to the experience of flow (Csikszentmihalyi, 1975). If the structure of the task includes correlates of flow onset (challenge-skill balance, clear goals, and unambiguous feedback) the performer will be more likely to experience flow (Abuhamdeh, 2020). Since flow requires sustained attention and is characterized by the ignoring of irrelevant dimensions, task that have less distractions may lead

to a higher overall experience of flow (aka "deep flow") or at least some of the dimensions of flow that correspond to attention, such as merging of action and awareness and concentration on the task at hand. For example, a distance runner will typically have very few distractions and only need to track their own performance and environment around them while a soccer player will have other players and the location of the ball to track and potentially be distracted by. Since the experience of flow is feelings of intense focus while the task performance feels almost "effortless", the ability to operate in an automatic fashion while still feeling some challenge will increase the likelihood of flow. Thus, challenging tasks with few distractions or tracking requirements will lead to higher flow experiences.

These thoughts are not novel as similar ideas have been expressed in previous publications, including the authors of the FSS (Jackson & Ecklund, 2004). However, to our knowledge, this discrepancy in dimension loading as a result of activity type has not been directly examined. Thus, it is the goal of the current study to examine the effect of activity type on the experience of flow. We hypothesize that flow will be experienced at higher levels overall when there is a higher experience of the antecedents. In addition, we hypothesize that the dimensions of transformation of time and loss of self-consciousness will be scored more highly when the performance domain does not require close tracking of time (individual endurance sports) and appearance (spectator sports), respectively, in order to perform well.

In the current study, flow antecedents (balance of challenge to skills, goal clarity, unambiguous feedback) and experience (merging of action and awareness, concentration, loss of self-consciousness, transformation of time, and autotelic) were measured within 1 hour of participants completing their activity. Flow antecedent scores and experience scores were then compared between activity types: academic exam-takers, individual sports, spectator sports, and team sports.

Our hypotheses are as follows:

- Hypothesis 1: There will be a significant, positive correlation between flow antecedent levels and flow experience levels.
- Hypothesis 2: Individual sport athletes will rate higher on flow experience dimensions than the other activity types.
- Hypothesis 3: Individual sport athletes will experience significantly more transformation of time than the other activity types.
- Hypothesis 4: Spectator sport athletes will experience significantly less loss of self-consciousness than the other activity types.

METHOD

Participants

The current study was approved to have met all ethical standards by the IRB committee of the first author's institution. All participants were recruited from the researchers' university and from two locally held races. Participants were recruited from the university's soccer (n = 34), dance (n = 21), cheer (n = 11), and swim teams (n = 14) and exam-takers from an advanced sport and performance psychology class (n = 26). The runners (n = 12) were recruited from local races. The final sample included 118 participants with the majority female (72 female, 46 males) ranging from 18 to 59 years of age (M = 23, SD = 5.86).

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Measures

All participants completed an online survey through the platform Qualtrics that asked them to assess their experience of flow during their performance or sport activity. Each survey consisted of a consent form, a demographic questionnaire, the FSS-2 (Jackson & Eklund, 2002), and the DFS-2 (Jackson & Eklund, 2002). The FSS-2 is a 36-item self-report instrument designed to assess flow experiences of individuals involved in physical activity and is designed to be effectuated within 1-hour of activity completion (Jackson & Eklund, 2002). The DFS-2, also 36-items, weighs an individual's frequency of flow experiences to quantify individual differences in the proclivity to experience flow (Jackson & Eklund, 2002). The DFS-2 was created to test Csikszentmihalyi's theory that certain individuals are predisposed to experience more flow states despite sub-optimal environmental conditions (Jackson & Eklund, 2002). Results of the DFS-2 are not presented here.

Procedures

All procedures were reviewed and approved by the Institutional Review Board at the researchers' university before any data collection began. After receiving verbal agreement from university coaches and instructor, researchers administered the survey to athletes and exam-takers at the completion of their performance activity (ie. dance practice). Additionally, the researchers hosted a booth at two community races with a sign advertising the study and providing a small, free gift for participating. The survey collected demographic data of participants after obtaining consent and affirming that participants were above 18 years old. All surveys were administered within one hour of activity completion.

Analyses

Participant scores were grouped into activity types: academics (exam-takers), individual sport (runners and swimmers), spectator sport (cheerleaders and dancers), and team sport (soccer players). Due to criticism of the FSS-2 for including dimensions that should be considered antecedents of flow rather than a description of the experience, we analyzed the antecedent dimensions (challenge-skills balance, clear goals, unambiguous feedback) separately from the dimensions that are deemed to be a part of the experience of flow (merging of action and awareness, concentration on the task at hand, sense of control, loss of self-consciousness, transformation of time, and autotelic). Flow antecedent scores were combined to create a total flow antecedent score and flow experience scores were combined to create a total flow experience score. A Pearson's r correlation was used to assess a relationship between total flow antecedent scores and total flow experiences scores. A 3 x 4 MANOVA was conducted comparing antecedent dimension scores between activity types and a 6 x 4 MANOVA was conducted comparing flow experience dimension scores between activity types.

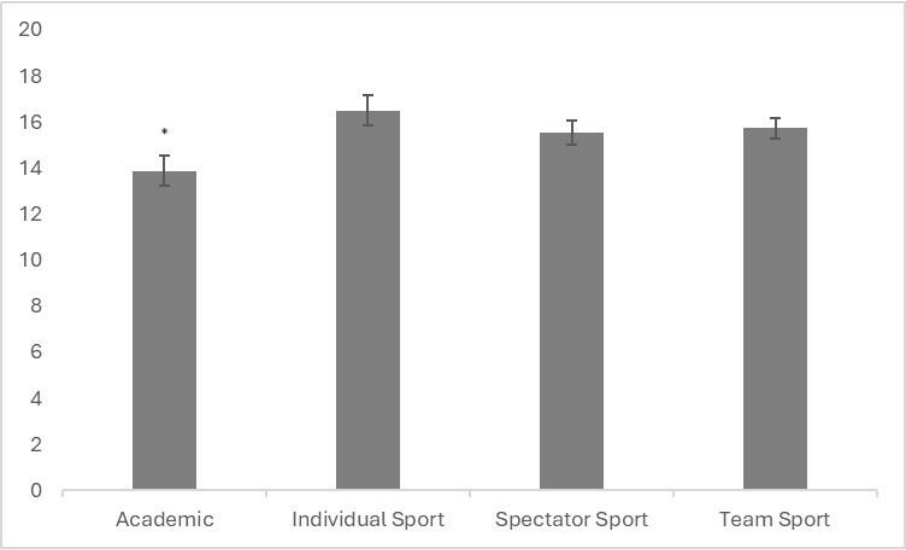
RESULTS

Participants were classified into four activity types: academic (N = 26), spectator sport (N = 32), individual sport (N = 26) and team sport (N = 34). Their scores on the FSS-2 were calculated for each of the 9 dimensions measured. The scores on the FSS-2 dimensions that represent antecedents flow (challenge to skills match, goal clarity, and unambiguous feedback) and the scores on the FSS-2 that represent flow experience (merging of action and awareness, concentration, loss of self-consciousness, transformation of time, and autotelic) were compared between activity types using separately ran multiple analysis of variances (MANOVAs).

An independent t-test was conducted in order to look for differences between the specific activity types that made up the activity types. No differences were found in any of the dimensions when cheer and dance (spectator activity) were compared or when running and swim (individual activity) were compared, $p > .05$.

Flow antecedent dimension scores were combined to create total flow antecedent scores and the flow experience dimension scores were combined to create total flow experience scores. The relationship between total flow antecedent scores and total flow experience scores was examined using a Pearson's r correlation analysis. A significant positive correlation was found between total flow antecedent scores and total flow experience scores, $r(118) = .615$, $p < .001$.

A 3 x 4 MANOVA was conducted to determine if the antecedent dimensions (challenge-skills match, clear goals, and unambiguous feedback) differed between activity type. Box's test of equality of covariance and Levene's test of equality of error variances indicated both assumptions were met ($p > .001$, $p > .05$). The overall model was significant, $F(3, 114) = 5.407$, $p = .002$, $\eta 2 = 0.125$. Tests of between-subjects effects found a significant effect of unambiguous feedback $F(3, 114) = 3.388$, $p = .021$, $\eta 2 = 0.82$, but no significant effect of balance between challenge and skills or goal clarity, $p > .05$. Follow-up Tukey's pair-wise comparisons revealed that academic exam-takers scored significantly lower on feedback ($M = 13.88$, $SD = 3.35$) than the individual sport athletes ($M = 16.5$, $SD = 3.38$, $p = .003$), the spectator sport athletes ($M = 15.56$, $SD = 2.98$, $p = .04$), and the team sport athletes ($M = 15.73$, $SD = 2.64$, $p = .022$). No other differences between activity types were found, $p > .05$ (Figure 1).



A 6 x 4 MANOVA was conducted to determine if the experience dimensions (merging of action and awareness, concentration, control, loss of self-consciousness, transformation of time, and autotelic) differed between activity type. Box's test of equality of covariance and Levene's test of equality of error variances indicated both assumptions were met ($p > .05$). The overall model was significant, $F(6, 111) = 7.519$, $p < .001$, $\eta 2 = 0.289$. Follow-up univariate ANOVAs showed that merging of action and awareness ($F(3, 114) = 5.656$, $p = .001$; partial $\eta 2 = .130$), loss of self-consciousness ($F(3, 114) = 10.309$, $p < .001$; partial $\eta 2 = .213$), and autotelic ($F(3, 114) = 7.076$, $p < .001$; partial $\eta 2 = .157$) were statistically significantly different between the activity

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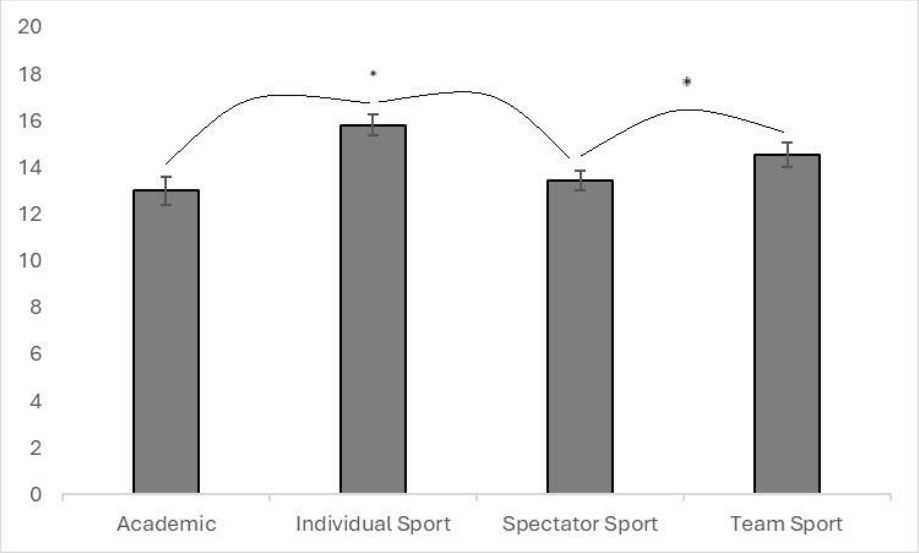
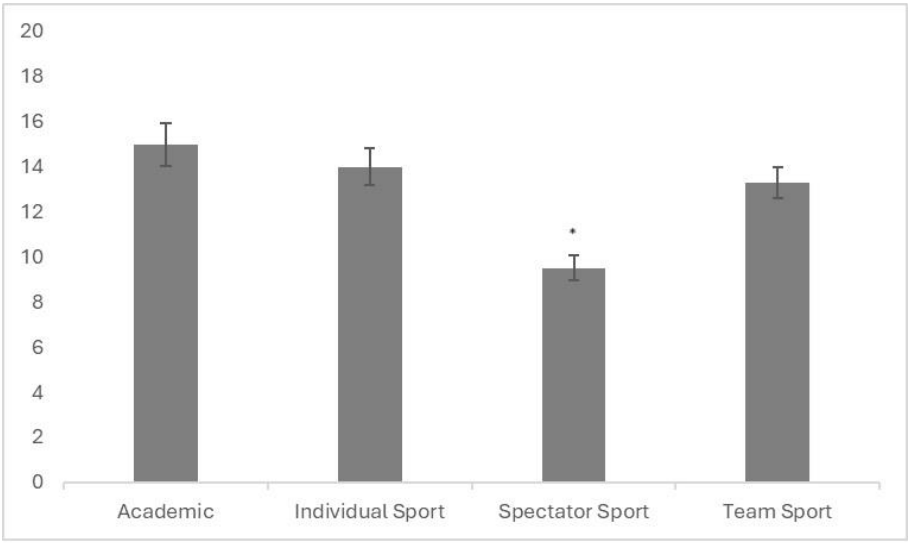
types. Tukey post-hoc pairwise comparisons were conducted for merging of action and awareness, loss of self-consciousness, and autotelic. For merging of action and awareness, independent sport athletes (M = 15.807, SD = 2.298) scored higher than academic exam-takers (M = 13, SD = 2.979, p < .001) and spectator sport athletes (M = 13.437, SD = 2.523, p = .001), and team sport athletes (M = 14.529, SD = 3.027) scored higher than academic exam-takers (p = .034), but there was no significant difference for any of the other comparisons (Figure 2).



For loss of self-consciousness, spectator sport athletes (*M = 9.5, SD = 3.152)* scored lower than academic exam takers (*M = 15, SD = 4.882, p* < .001), independent sport athletes (*M = 14, SD = 4.270, p* < .001), and team sport athletes (*M = 13.294, SD = 4.108, p = .001), but there was no difference in any of the other pairwise comparisons (Figure 3).*



For autotelic, academic exam-takers showed lower scores (M = 12.269, SD = 3.231) than individual sport athletes (M = 15.384, SD = 3.96, p = .001), spectator sport athletes (M = 15.125, SD = 3.581, p = .002), and team sport athletes (M = 16.206, SD = 2.847, p < .001, Figure 4).

DISCUSSION

Differences between activity types included significantly lower levels of unambiguous feedback (antecedent) and autotelic (experience) for academic exam-takers, significantly lower loss of self-consciousness (experience) for spectator sport athletes, and significantly higher levels of merging of action and awareness (experience) for individual sport athletes (compared to academic exam-takers and spectator sport athletes) and team sport athletes (compared to academic exam-takers).

A strong, positive relationship between total flow antecedent scores and total flow experience scores was found, supporting our first hypothesis. This was to be expected and simply served as a check. The relationship was quite strong, despite the low scores of feedback by the academic exam-takers.

Our second hypothesis, that individual sport athletes will experience more of the flow experience dimensions than the other activity types, was partially supported by the finding that individual sport athletes experienced more merging of action and awareness than academic exam-takers and spectator sport athletes. There were no significant differences between team sport athletes and individual sport athletes on any of the flow experience dimensions, which does not support our hypothesis. However, individual sport athletes had numerically higher scores of merging of action and awareness than team sport athletes. This difference may have been significant had we had larger sample sizes. It also could be that this is simply reflecting a continuum of flow from shallow to deep flow states (see Tenenbaum, et. al., 1999) where individual sport athletes experienced deep flow states, academic exam-takers and spectator sport athletes experienced shallow flow states, and team sport athletes were somewhere in the middle.

Our third hypothesis, that individual sport athletes would experience significantly more transformation of time than the other activity types, was not supported. While numerically they had the highest level of transformation of time than the activity types, it did not reach significance. While it is possible this difference may have reached significance if we had had higher sample sizes, it may also be that the swimmers, all members of the swim team at a division one university, were attending to the passing of time given the importance of their lap times. The samples sizes were too small conduct this comparison.

The finding that spectator sport athletes experienced significantly less loss of self-consciousness than the other activity types supported our fourth hypothesis. This is in alignment with Jackson's (1992) finding that elite figure skaters largely did not experience a loss of self-consciousness and with the weak loading of this dimensions on the FSS-2 (Jackson & Eklund, 2004). In spectator sports, such as dance, cheer, and, arguably, figure skating, considering how you appear to the crowd is a crucial part of the activity. This fits with the explanation that self-consciousness is lost only when how one is perceived by others is an irrelevant dimension to performance of the activity.

Academic exam-takers experienced significantly less unambiguous feedback and autotelic feelings than all of the other activity types. Given that the exams did not provide any feedback and that taking exams is not generally deemed to be an enjoyable experience, these findings were not surprising. The finding that the activity type that was significantly lower in a well

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agreed upon dimension of the flow experience (autotelic) also was significantly lower in one of the well agreed upon antecedents of flow (unambiguous feedback) is in line with what is expected: when antecedents of flow are not met it is more difficult, if not impossible, to experience flow.

These results support the idea that the flow state cannot be experienced equally across activity type and that participation in certain activities, those that meet the antecedents and limit distraction, will lead to a higher likelihood of experiencing flow and experiencing higher levels (or deeper) flow. In addition, it further supports newer models of flow that are not including loss of self-consciousness as a part of the flow experience (Norsworthy, et al., 2023; Swann, et al., 2022).

Limitations

Limitations of this study are the mediocre sample size, the age differences, and the lack of more activity types. While our sample size was sufficient for the analyses we conducted, it may have been too small to pick up on some of the smaller but meaningful differences, such as differences between team sport athletes and individual sport athletes on merging of action and awareness or differences in experience of transformation of time between activity types. Also most of our participants were college students, but the endurance runners also consisted of older adults. Thus, there was a disparity in age between the individual sport athlete (runners) and the rest of the participants that could have affected the results. Finally, we would have loved to have included more activity types, such as artists, musicians, and writers. This would have provided us with even more insight into the way that flow is differentially experienced across activity types.

Future Directions

There is a need for the experience of flow to be examined across multiple activity types beyond sport and academics. Part of the difficulty in flow research is that it is described, measured, and even labeled differently in sport, performing arts, education, meditation, and work environments. An examination of how flow is experienced across activity types in a variety of domains will help lead to a consensus on the definition of flow.

Conclusion

The current study provides further evidence that loss of self-consciousness is not a part of the flow experience for spectator-sport athletes. These athletes experienced significantly less loss of self-consciousness than all of the other activity types even though there was no difference in their ratings on the flow antecedents. In addition, the finding that in individual sports there is more experience of merging of action and awareness indicates that certain activities, such as endurance running, lend themselves more to flow. In a complementary fashion, the academic exam-takers scored significantly lower on unambiguous feedback and autotelic than all other activity types, supporting the idea that it could be quite difficult to experience flow in some activity types. Thus, we conclude that loss of self-consciousness should not be considered a part of the flow experience and that further examination on the relationship between activity type and flow experience should be explored.

We have no known conflict of interest to disclose.

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