

Sent: Wednesday 5 December 2018 16:31:44

To: Cowley, Ben

Subject: Your Submission XGE-2018-1459 - [EMID:587226fa723a7786]

XGE-2018-1459

Flow experiences during visuomotor skill acquisition reflect deviation from a power-law learning curve, but not overall level of skill
<i>Journal of Experimental Psychology: General</i>

Dear Dr Cowley,

I have received your manuscript entitled "Flow experiences during visuomotor skill acquisition reflect deviation from a power-law learning curve, but not overall level of skill" (XGE-2018-1459) that you recently submitted to Journal of Experimental Psychology: General. I have read this manuscript, as has one other editor. Although the paper has several admirable qualities, there are some major concerns, on the basis of which we have decided to decline to publish the manuscript in Journal of Experimental Psychology: General.

We believe that the study of skill acquisition and performance, and the particular subtopic of flow, could be one that is suitable for readers of this journal. We also thought that the overall experimental design, the task, and the methods of data analysis were sound. However, our view is that your experimental results have interpretations that cast doubt on your central conclusions. At the heart of the issue is the use of a self-reported Flow scale as your key dependent variable. This scale may indeed be a valid measure of flow as commonly conceived. However, the fact that no scale is a pure measure of its underlying construct means that the answers to the question that make up the Flow scale are potentially susceptible to other influences. In your experimental design, subjects performed multiple instances the CogCarSim task, answering those questions after each. It seemed to us that this within-subjects design might have invited subjects to interpret some of the Flow questions (e.g., "My thoughts/activities run fluidly and smoothly") as simply asking about their relative performance on that trial. That is, the fact that subjects reported greater flow on those trials in which they performed better may have occurred because subjects were self-reporting their performance rather than their flow. You did report another result (that blink rate is related to learning rate) but that result is not directly related to the empirical phenomenon around which the paper is organized, namely flow.

I realize that there are subjective aspects of these sorts of judgments but we receive many more submissions than we can publish and so strive to spare authors from a needless delay if it does not seem likely that the paper will eventually be published in the journal. If you decide to pursue publication in another journal at some point, I hope that the comments offered here will be helpful.

Thank you for submitting your work to the Journal. I wish you the best in your continued research, and please try us again in the future if you think you have a manuscript that would be a good fit for JEP:G.

Sincerely,

Bob Rehder

Associate Editor

<i>Journal of Experimental Psychology: General</i>

APA asks that you please take a moment to give us your feedback on the peer review process as you experienced it, by completing a short survey, available at <http://goo.gl/forms/qzKP6Zkqx9>.

In compliance with data protection regulations, please contact the publication office if you would like to have your personal information removed from the database.

Re: Your Submission XGE-2018-1459 - [EMID:587226fa723a7786]

Cowley, Ben

Mon 10/12/2018 23:28

To: Journal of Experimental Psychology: General <estern@apa.org>;

FAO Bob Rehder, Elizabeth Stern

Dear

Dr. Rehder

Thank

you indeed for your judgement and insightful comments. I have a couple of questions, the first for yourself, the second for the journal manager Elizabeth.

First,

as you say, these things tend to be subjective, so we might as well try to persuade you otherwise. Is it possible to reconsider the judgement in light of our counter-argument, and send the paper to peer-review? If so, I enclose below our responses to you.

Note, we fully realise the possibility that reviewers will reject us anyway: however, because we have something substantive to say about Flow and because you have a journal with profile, the chances are greater that we can get the input of true experts in

Flow, e.g. Csikszentmihalyi or Johannes Keller, who would then help us resolve the issue you raised to give greater final value to the community.

Second

(to Elizabeth), if the decision will not be reconsidered, is it possible for us to resubmit our paper to JEP: Human Perception and Performance as a transfer of the existing submission?

**Our
response:**

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In your experimental design, subjects performed multiple instances the CogCarSim task, answering those questions after each. It seemed to us that this within-subjects design might have invited subjects to interpret the some of the Flow questions (e.g., "My thoughts/activities run fluidly and smoothly") as simply asking about their relative performance on that trial.

Firstly,

we note that (high) performance is always reflected in the Flow experience. What seems, across the definitions in the literature, to be the subjective distinction between non-Flow and Flow states is the feeling of effort or ease which was required to perform at a high level. Flow Short Scale (FSS) questions reflect that distinction more than they reflect the distinction

between high and low performance (less fluid thoughts/activities can still produce high performance, but it requires greater subjective effort).

However,

it is true that the FSS self-reports might reflect some aspect of performance self-evaluation: it is almost expected!

Self-reports that are collected after task performance (rather than during the task) in general cannot be guaranteed to not be affected by the respondent's knowledge of performance outcomes.

Is there

any alternative?

Sampling

Flow experiences during the task might avoid performance outcome knowledge (if such knowledge is not self-evident during the task, which it is in our task), but would itself change the experience (promote self-awareness and disrupt Flow), or the performance,

or both. Given reasonable means, it is basically impossible to collect written self-reports while subjects perform an immersive and Flow-inducing task requiring motor skills. Also, currently the principle way to access personal experiences is via self-report,

which is most reliable in written form using validated psychometric tools. For these reasons,

most Flow research to date is based on post-hoc self-report

measures, which are considered the gold standard in measuring Flow (witness

the large literature on generating and validating such measures for a range of applications).

Is this

a serious issue for the validity of self-report measures of Flow?

If it

is, then **all**

Flow research is suspect (i.e. this is not a specific flaw in our design). But to treat it so, is to make a strong and substantive assumption that any measure of Flow (including self-reported Flow) SHOULD measure ONLY the experience elicited during task performance.

I.e. any effect of knowledge of outcome is treated as artefactual. We know of no reason to define Flow in this way (to exclude e.g. the elation of strong performance from the underpinnings of Flow).

Thus,

while these measures are "confounded" by performance outcomes, the magnitude of this confound cannot be determined, and cannot be argued to be fatal unless one chooses to

a priori

define Flow experience to arise from processes distinct from knowledge of outcome -- in which case most Flow research to date would have been (and will continue to be) potentially invalid.

In other

words, such measurement confounding is an unavoidable feature of this type of work (i.e. longitudinal tracking of experience of skill acquisition), and that is why we attack the problem as we do, by modelling learning.

>>

That is, the fact that subjects reported greater flow

on those trials in which they performed better may have occurred because subjects were self-reporting their performance rather than their flow

Here

is the crux of the matter: what is important in this analysis is the distinction between the global reference level (total improvement over baseline) versus the local reference level (the trial-wise divergence from the power-law learning curve model). This

shows how Flow responds in practice, which does not rely on the component experiential properties measured by the FSS DV.

So in

summary to the main point of this debate: (a) even if the FSS DV reflects performance to some degree (and we believe it does and it has to), it nevertheless still fully and validly reflects Flow (in agreement to how this construct has been measured in prior

literature); and (b) **our result illustrates how this**

concept of Flow interacts with skill acquisition, responding to a power-law model of learning/performance but not an absolute level thereof.

>>

You did report another result (that blink rate is related

to learning rate) but that results is not directly related to the empirical phenomenon around which the paper is organized, namely flow

This

issue may not be central to the decision, but to be precise: in fact the RQ3 result that relates blink rate and learning becomes truly robust only thanks to an interaction with mean Flow. This does bear directly on the main result, which links learning and

Flow, showing how a between-subjects relationship might be mediated by physiological characteristic.

Thus,

in closing, while we do not dispute your claim in essence, we feel it does not fully reflect the work, and our hope is to take this debate onwards with some group of expert reviewers. If you feel that (in order to begin the review process) we should already amend the paper at this point to reflect what we've written above and clarify our position, we'll be happy to do so.

best regards

Ben

Benjamin Cowley PhD

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Docent, Cognitive Science unit, University of Helsinki, Finland.

From: em.xge.0.5fb682.761b708f@editorialmanager.com <em.xge.0.5fb682.761b708f@editorialmanager.com> on behalf of Journal of Experimental Psychology: General <em@editorialmanager.com>

Regarding your submission to Journal of Experimental Psychology: General - XGE-2018-1459 - [EMID:f5845553e5ded552]

em.xge.2e39f.5fefc2.b4af0e9e@editorialmanager.com on behalf of
Bob Rehder <em@editorialmanager.com>

Sat 15/12/2018 20:48

To: Cowley, Ben <ben.cowley@helsinki.fi>;

XGE-2018-1459

Flow experiences during visuomotor skill acquisition reflect deviation from a power-law learning curve, but not overall level of skill

Dr Benjamin Ultan Cowley

Journal of Experimental Psychology: General

Dear Dr. Cowley,

Thank you for your message regarding the manuscript you submitted. I'll only add a few brief comments. I'm glad that we agree about the likely presence of a confound in your flow DV. I would only add that within subject designs seem likely to exacerbate that confound. In your experiment, I can imagine a subject searching for a reason for why they're repeatedly being asked the same question and concluding that they're suppose to compare the current trial against the previous one and that accuracy occurs to them as the most obvious dimension on which to carry out that comparison. Under this interpretation, your findings illustrate that subjects are aware of their own trial-by-trial performance, which of course fluctuates around their current baseline level of performance (as estimated by the power law fits you carried out). Given this possibility, it remains unclear to me what new conclusions about flow itself can be drawn from these data.

Speaking for myself, it seems what is needed is alternative measures of flow that don't suffer from the confound. I don't know what those measures are but I suspect they will likely need to be something implicit rather than an explicit judgment. Without them, it is hard for me to see how the concept of flow can undergo additional theoretical development.

Again, I hope you find these comments helpful as you move forward with your research.

Best regards,

Bob Rehder
Associate Editor
Journal of Experimental Psychology: General

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