On the Mechanics of Goal Striving:

Experimental Evidence of Coasting and Shifting

Online Supplementary Material (OSM)

Different data analytic strategies may have different advantages, and may even lead to

substantially different results (Silberzahn et al., 2018). Our reasoning for using an ANCOVA

approach in the primary analyses just reported was that it removes superfluous variance

(Tabachnick & Fidell, 2013). However, the editor and one reviewer pointed to two important

alternative approaches to analyzing the data, namely to treat time (baseline vs. post-

manipulation) as a within-subject factor or to calculate difference scores (Time 2 – Time 1).

These two approaches investigate intra-individual change in response to performance

feedback.

For the repeated measures analysis, we used the procedure MIXED with the command

TEST in SPSS 25 (IBM Corp., 2017) and included Time (baseline vs. post-manipulation) as a

within-subject factor and condition as a between subject factor. The editor reasoned that

differences between conditions should be apparent only in Round 2 (after the experimental

manipulation was delivered), but not in Round 1 (at baseline, before it was administered). We

therefore tested (a) the Time × Contrast interaction by reversing Round 1 contrasts, and (b) if

a significant contrast was found, separately tested Round 1 (setting the experimental contrast

to 0) and Round 2 (setting the baseline contrast to 0) effects. We expected (a) a significant

interaction, (b) no effect at Round 1, and (c) a significant effect for Round 2.

Experiment 1

Additional analyses: Repeated measures and difference scores. Regarding accuracy,

we observed (a) the Time × Contrast interaction, $t(146) = 3.58$, $p < .001$, $r_{contrast} = .284$, (b) no

baseline contrast, $t(146) = 0.81$, $p = .211$, $r_{contrast} = .067$, and a (c) significant contrast in

Round 2, $t(146) = 2.82$, $p = .003$, $r_{contrast} = .228$. Regarding speed, we again observed (a) a significant Time × Contrast interaction, $t(146) = 1.67$, $p = .048$, $r_{contrast} = .137$, but neither (b) a significant contrast at baseline, $t(146) = 0.29$, $p = .385$, $r_{contrast} = .024$, nor (c) in Round 2, $t(146) = 1.49$, $p = .069$, $r_{contrast} = .122$. Regarding mood, we again observed (a) a significant Time × Contrast interaction, $t(146) = -4.26$, $p < .001$, $r_{contrast} = .333$, (b) no contrast at baseline, $t(146) = 0.61$, $p = .273$, $r_{contrast} = .050$, and (c) a significant contrast in Round 2, $t(146) = -2.41$, $p = .009$, $r_{contrast} = .195$. Regarding self-reported effort, we did not observe a Time × Contrast interaction, $t(146) = -1.27$, $p = .104$, $r_{contrast} = .104$. In sum, results regarding errors and mood were robust in the repeated measures analysis, but while we observed a Time × Contrast interaction for speed, the Round 2 contrast was not significant.

Difference score contrast analyses without covariates were fully consistent with our ANCOVA approach: We observed significant contrasts for accuracy, $F(1,146) = 12.84$, $p < .001$, $\eta_p^2 = .081$, speed, $F(1,146) = 3.95$, $p = .049$, $\eta_p^2 = .026$, and mood, $F(1,146) = 18.15$, $p < .001$, $\eta_p^2 = .111$. Again, no contrast emerged for self-reported effort, $F(1,146) = 1.61$, $p = .207$, $\eta_p^2 = .011$. Moreover, to account for baseline performance level, we repeated these difference score analyses using Round 1 as a covariate, which yielded the same significant effects.

Experiment 2

Additional analyses: Repeated measures and difference scores. We again performed additional repeated measures and difference score analyses, as in Experiment 1. Regarding accuracy, repeated measures analyses showed the Time × Contrast interaction, $t(218) = 2.63$, $p = .005$, $r_{contrast} = .176$, but we neither observed a Round 1 contrast, $t(218) = -1.13$, $p = .130$, $r_{contrast} = .076$, nor a Round 2 contrast, $t(218) = 0.94$, $p = .175$, $r_{contrast} = .063$. Regarding speed, we observed the Time × Contrast interaction, $t(218) = -4.03$, $p < .001$, $r_{contrast} = .263$, no Round 1 contrast, $t(218) = -0.66$, $p = .255$, $r_{contrast} = .044$, and a significant Round 2

contrast, $t(218) = -3.00$, $p = .002$, $r_{contrast} = .199$. In sum, the Round 2 contrast for accuracy was not significant, but results were otherwise consistent with our hypotheses.

Difference score analyses were again fully consistent with our ANCOVA analyses. We observed a significant contrast for reaction time, $F(1,218) = 16.26$, $p < .001$, $\eta_p^2 = .069$, and errors, $F(1,218) = 6.94$, $p = .009$, $\eta_p^2 = .031$. Including Round 1 as a covariate in a separate analysis yielded the same significant effects.

General Discussion

According to helpful suggestions during the review process, we conducted subsidiary repeated measures and difference score analyses. Repeated measures analyses were largely consistent with our theory, with the exception of two expected Round 2 contrasts (speed in Experiment 1 and accuracy in Experiment 2) that did not emerge. We speculate that our experimental task may have been less well suited for observing intra-individual change than between-condition differences. Fulford, Johnson, Llabre, and Carver (2010) did observe coasting in intraindividual change in a field setting, and future research should therefore aim to develop stronger tasks that can replicate coasting within individuals.

As we discuss in the main paper, Carver (2003) has suggested that coasting and shifting become more likely as the person's resources are taxed by an increase in the number of goals being pursued. Perhaps stronger effects would be obtained if the load on the participant was further increased by superimposing additional, extraneous tasks onto the lexical task used in the present study or by using words of different lengths. Although the repeated measures analyses were not fully consistent with the results of the primary analyses, it is noteworthy that difference score analyses with and without baseline as a covariate fully replicated the primary findings presented. In sum, apart from two follow-up contrasts in the repeated measures analysis our findings were consistent across all analyses.

References

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