Motivational and Emotional Effects of Phonetic Orthography Instruction Approaches With Delayed Correction

Julia Erdmann, Ruhr-University Bochum, julia.erdmann@rub.de
Nikol Rummel, Ruhr-University Bochum, nikol.rummel@rub.de

Abstract: In widespread German orthography instruction approaches, children's misspellings are not corrected for a prolonged time-period in the initial learning phase. Advocates argue that these approaches lead to high student motivation. We hypothesize that when regular correction of misspellings sets in eventually, motivation will reverse and further, frustration will evolve. The results of our experimental study indicate that the timing of correction does have the hypothesized effect on student's intrinsic motivation and frustration.

Introduction

Widespread German orthography instruction approaches, encourage children to write words freely in the way in which they pronounce them. These approaches foresee no systematic correction of spelling errors for a prolonged time-period in the initial learning phase (e.g., Reichen, 1988, Brinkmann, 2018). Advocates of these approaches claim that through creating self-guided learning opportunities and through enabling learners to use written language freely and early in the learning process leads to high student motivation (e.g., Reichen, 1988, Brinkmann, 2018). However, so far, there is no empirical evidence for this claim (Funke, 2014).

Building upon results from research on instruction approaches with delayed instruction that are constructivist-inspired, it can be assumed that children do experience higher motivation to learn when they can engage in self-guided and little teacher-directed learning activities in comparison to approaches with a high amount of guidance (e.g., Glogger-Frey et al., 2015). These positive motivational effects can be explained with the help of self-determination theory (e.g. Deci & Ryan). Students' needs for autonomy and perceived competence should be optimally satisfied, when learning with constructivist-inspired instruction approaches.

Based on these findings, we assume that in phonetic spelling instruction with delayed correction, students' needs for autonomy and competence are being satisfied in the initial phase of learning how to spell. However, from a certain point in time, schools do not tolerate phonological spelling anymore and the phase of non-correction ends eventually. We hypothesize that when error correction sets in (which in Germany starts the latest in secondary school) motivation should decrease, as students' satisfaction of needs for autonomy and competence should then be frustrated all of a sudden. Further, it is reasonable to assume that not receiving feedback for a prolonged time could lead to an illusion of competence. When this illusion of competence is shattered, when eventually correction sets in, this could lead to negative emotional reactions, such as frustration towards the object of learning (see Weaver, 2017).

Method

The present study aims at uncovering causal mechanisms underlying the motivational and emotional effects of phonetic spelling instruction approaches with delayed correction. Therefore, we investigated the aforementioned hypotheses in a maximally controlled laboratory setting, systematically investigating the timing of correction. We compared two conditions, one in which participants were corrected with a delay (delayed correction) and one in which participants were corrected immediately after an error occurred (immediate correction).

Participants were 79 students from Ruhr-University Bochum (71 women, M_{age} = 24, age range: 18-33). To measure intrinsic motivation, we used the "Short Scale of Intrinsic Motivation" (Kurzskala intrinsischer Motivation [KIM], Wilde, Bätz, Kovaleva & Urhahne, 2009). To measure frustration, we engaged the "Epistemically-Related Emotion Scales [EES]" (Pekrun, Vogl, Muis & Sinatra, 2016).

Participants were presented with the learning and instructional materials on the screen of a personal computer and via headphones. Participants learned, in two consecutive learning phases, to spell sounds of an artificial vocabulary with the help of a phonetic instruction method. Using this method, inevitably led to orthographical errors in half of the-to-be learned words. In the first learning phase, immediate-correction participants received corrective feedback prompts after an orthographical error occurred. In delayed correction, however, participants did not receive corrective feedback in the first learning phase but merely a motivational prompt. After completing learning phase one, participants filled in the IMI and EES short scale questionnaires and then had a short break for five minutes. Afterwards, they moved on to learning phase two. In learning phase two orthographical errors were corrected in both conditions. At the end of the session, participants again completed the IMI and EES questionnaires.

Results and discussion

We ran a multivariate mixed model ANOVA with condition as between-subjects factor, test time as within-subjects factor and motivation and frustration as dependent variables.

Given the assumptions based on self-determination theory (see introduction), we hypothesized that intrinsic motivation at different time points would depend on when in the learning process correction sets in. We predicted that an advantage of the delayed correction condition after the initial learning phase of non-correction would diminish after correction set in. In accordance with our expectations, univariate analysis revealed a significant interaction effect ($F(1.\ 77) = 51.49$; $p < .001$; $\eta p^2 = .401$), indicating that motivation differed between the two test times depending on the condition. Also in line with our expectation, the descriptive statistics reveal that delayed correction participants were more intrinsically motivated ($M = 3.21$; $SD = 0.60$) after the phase of non-correction, compared to immediate correction participants ($M = 2.96$; $SD = 0.49$). As we predicted, after correction set in, the difference between the groups reversed (delayed correction: $M = 3.08$; $SD = 0.77$; immediate correction: $M = 3.58$; $SD = 0.56$). This reverse, however, is against our predictions, mainly due to an increase of motivation in immediate correction and not a decrease in delayed correction

We further assumed that delayed correction participants would develop an illusion of competence and that the shattering of that illusion through the provision of feedback would lead to frustration in the delayed correction participants after the second learning phase. As we expected, univariate analysis revealed a significant interaction effect ($F(1, 77) = 30.27$; $p < .001$; $\eta p^2 = .282$), which indicates that frustration differed between the test times depending on the condition. In the first learning phase, delayed correction was less frustrated ($M = 2.01$; $SD = 0.91$) than immediate correction ($M = 2.40$; $SD = 0.99$). In line with our hypothesis, this difference reversed after the second learning phase and delayed correction reported higher frustration ($M = 2.20$, $SD = 1.18$) than immediate correction ($M = 1.35$; $SD = 0.39$). We did, however, expect that frustration would substantially increase in delayed correction, but the difference after learning phase two was instead mainly due to a decrease of frustration in the immediate-correction condition.

Taken together, the results of the present study confirm our assumptions that phonetic spelling acquisition with delayed correction compared to immediate correction has positive motivational and emotional effects only in the initial phase of non-correction and that these effects diminish after correction sets in. Hence, our study provides first evidence that the often-claimed motivational advantage of phonetic spelling instruction with delayed correction might be short-termed, and that it is effective only in the phase of non-correction. Our study was designed to test our hypotheses in a maximally controlled laboratory setting, ensuring internal validity. Hence, the most concerns of the present study refer to the generalizability of our results to the reality of classrooms. In a classroom-setting, intrinsic motivation and frustration might develop differently over time in the process of learning with the investigated instruction approaches. Hence, future research should work towards bringing the investigation of the effects found in our study, to the field.

References

Brinkmann, E. (2018). Der Spracherfahrungsansatz. Freies Schreiben von Anfang an. *Grundschule, 50*(6), 28-32.

Deci, E. L., & Ryan, R. M. (2000). The" what" and" why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological inquiry*, 11(4), 227-268.

Pekrun, R., Vogl, E., Muis, K. R., & Sinatra, G. M. (2017). Measuring emotions during epistemic activities: the Epistemically-Related Emotion Scales. *Cognition and Emotion*, *31*(6), 1268-1276.

Funke, R. (2014). Erstunterricht nach der Methode Lesen durch Schreiben und Ergebnisse schriftsprachlichen Lernens–eine metaanalytische Bestandsaufnahme. *Didaktik Deutsch*, *19*(36), 20-41.

Glogger-Frey, I., Kappich, J., Schwonke, R., Holzäpfel, L., Nückles, M., & Renkl, A. (2015). Inventing motivates and prepares student teachers for computer-based learning. *Journal of Computer Assisted Learning, 31*(6), 546-561.

Reichen, J. (1988). *Lesen durch Schreiben. Heft 1: Wie Kinder selbstgesteuert lesen lernen*. Zürich: Sabe.

Weaver, J. (2017). Eliminating the Illusion of Learning from Engineering Courses. *In Proceedings of the Conference of the American Society for Engineering Education Rocky Mountains Section Conference Proceedings.* [Retrieved online from: https://www.researchgate.net/profile/Jason_Weaver2/publication/328917289 (20.11.2019)].

Wilde, M., Bätz, K., Kovaleva, A., Urhahne, D. (2009). Überprüfung einer Kurzskala intrinsischer Motivation (KIM). *Zeitschrift für Didaktik der Naturwissenschaften, 15*, 31-45.