Motivational Patterns During Hypermedia Learning

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Our aim was to test Vollmeyer and Rheinberg's cognitive-motivational process model (2000) in the context of learning a hypermedia program. The model assumes that initial motivation affects learning through the mediating variables *motivational state* during learning and *strategy* used for learning. Initial motivation contains four factors: *probability of success*, i.e., learners take into account their ability and the perceived difficulty of the task; *anxiety,* i.e., learners think about failing the task; *challenge,* i.e., whether learners accept the situation as an achievement situation; and *interest*, i.e., whether the topic of the learning material is important.

Method

The hypermedia program described the outbreak of World War I (Vollmeyer & Burns, 2002) on 51 pages. The 42 participants read the instructions saying that after about 25 minutes of learning they will answer a questionnaire. Before starting they answered the QCM (*Q*uestionnaire of *C*urrent *M*otivation; Rheinberg, Vollmeyer, & Burns, 2001) measuring anxiety, probability of success, interest, and challenge. When working with the program we measured two mediating variables: (1) the motivational state (three items e.g., "The task is fun"), and (2) strategy as time per page. The dependent variable was knowledge assessed with 34 questions. To take speed as well as accuracy into account we calculated knowledge as the product of correct answers in the knowledge test and number of pages looked at.

Results and Interpretation

The four factors of initial motivation have some intercorrelation (Rheinberg et al., 2001), so we looked for common patterns in initial motivation through a hierarchical cluster analysis. We found 2 groups: In the first group interest and probability of success were significantly higher, in the second group anxiety and challenge (see Table 1). Thus we interpreted the first group as interested and believing in success (I/P), the second as challenged, but fearing failure (A/C). Table 1 shows how differently these two groups learned the program. The I/P-group had a higher motivational state during learning, they looked at more pages and thus spent less time per page. Knowledge, measured as the product of number of pages * correct answers, was also higher for the I/P-group.

Table 1: Means for I/P- (n = 20) and A/C-group (n = 22).

	I/P	A/C	p
interest	5.34	4.58	.013
probability of success	5.94	4.74	.001
challenge	4.18	4.69	.065
anxiety	1.54	3.35	.001
motivational state	5.60	4.46	.004
time per page	30.55	38.81	.013
number of pages	43.70	35.91	.008
correct answers	15.05	12.86	.082
number * correct answers	653.00	460.82	.002

To test if initial motivation affects learning through the motivational state and strategy we calculated regression analyses. First we found that initial motivation correlated with motivational state, r = .44, time per page, r = -.38, and knowledge, r = .46. The mediating variables also correlated with knowledge (motivational state: r = .37, time per page: r = -.58). However, in a regression analysis, in which the predictor (I/P-, A/C-group) is controlled, only time per page is significant, β = -.46, t = 3.52, p = 0.001. In conclusion, we found that initial motivation affected learning only via strategy: More anxious and challenged learners spent more time per page but they learned less of the page's content compared to success-oriented and interested learners.

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References

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