



## Reading Medium and Interest: Effects and Interactions

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Virginia Clinton

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## **Reading Medium and Interest: Effects and Interactions**

Reading from screens, also known as digital reading, has become a commonplace activity for many people in modern life (Mangen, Olivier, & Valey, 2019). Three recent meta-analyses have indicated reading from screens is less effective than reading from paper (Clinton, 2019; Delgado, Vargas, Ackerman, & Salmerón, 2018; Kong, Seo, & Zhai, 2018). However, these meta-analyses have also indicated substantial variability in reading medium findings and the characteristics of readers and reading situations that could vary the effect of reading medium are not well understood (Clinton, 2019; Delgado et al., 2018). One potential moderator is interest as it is well established as playing an important role in learning from text (Soemer & Schiefele, 2019). The primary purpose of this study is to examine the interplay between interest and reading medium (screen or paper) on learning from text.

A critical area of inquiry is better understanding why the differences between reading from paper and screens exist (Wylie, Thomson, Leppänen, Ackerman, Kannianen, & Prieler, 2018). One possible reason may be that reading medium could affect the interest evoked from a text, known as the situational interest. Reading from screens has been noted as less engaging and more awkward than reading from paper (Mangen & Kuiken, 2014). Moreover, the experience of reading from screens may be more disrupted and involve less immersion than that of reading from paper (Hou, Rashid, & Lee, 2017). Less engagement and more feelings of disruption when reading from screens could lessen the possibility that the readers' interest would be "caught" by potentially appealing features of the text (Ainley, 2017; Grund, Schäfer, Sohlau, Uhlich, & Schmid, 2019). The secondary purpose of this study is to examine the effects of reading medium on situational interest.

## **Methods**

Undergraduate students (N = 206) indicated their individual interest in the text topic then were randomly assigned to read an excerpt from a sociology textbook either from an iPad or paper. After reading, they answered 10 multiple choice questions and reported their situational interest. Then, they completed a maze task to briefly assess reading skill.

### Results

A mixed-effects model was used with a two-way interaction of medium condition and individual interest ratings, problem and participant as random factors, and accuracy on each item as the dependent variable. Based on the model (see Table 1), medium condition and individual interest were not significant factors. The interaction between medium condition and individual interest was not significant.

Table 1

<b>Random Effects</b>	<b>Variance</b>	<b>SD</b>		
Participant	.37	.61		
Item	.84	.91		
<b>Fixed Effect</b>	<b><math>\beta</math> estimate</b>	<b>SE</b>	<b>z value</b>	<b>p value</b>
Intercept	-1.6	.53	-3.00	.002
Medium condition	-.62	.499	-1.23	.21
Individual interest	-.01	.06	-.19	.85
Background knowledge	.17	.07	2.42	.02
Reading skill	.04	.01	3.74	<.001
Situational interest	.31	.0	4.19	<.001
Medium condition*Individual interest	.20	.12	1.67	.09

A similar model was conducted with situational interested. There was a significant interaction between situational interest and medium condition (see Table 2). As can be seen in Table 3, situational interest did not reliably predict performance when reading from paper. In contrast, situational interest was a positive predictor when reading from screens.

Table 2

<b>Random Effects</b>	<b>Variance</b>	<b>SD</b>		
Participant	.36	.60		
Item	.84	.92		
<b>Fixed Effect</b>	<b><math>\beta</math> estimate</b>	<b>SE</b>	<b>z value</b>	<b>p value</b>
Intercept	-1.60	.53	-3.01	.003
Medium condition	-1.20	.64	-1.89	.06
Situational interest	.31	.07	4.244	<.001
Background knowledge	.17	.07	2.45	.01
Reading skill	.03	.01	3.23	.001
Individual interest	.02	.06	.26	.80
Medium condition*Individual interest	.32	.15	2.23	.03

Table 3

<b>Paper</b>				
<b>Random Effects</b>	<b>Variance</b>	<b>SD</b>		
Participant	.19	.44		
Item	.67	.82		
<b>Fixed Effect</b>	<b><math>\beta</math> estimate</b>	<b>SE</b>	<b>z value</b>	<b>p value</b>
Intercept	-.62	.62	-1.01	.31
Situational interest	.17	.09	1.83	.07
Background knowledge	.18	.09	1.94	.05
Reading skill	.02	.02	1.63	.10
Individual interest	-.06	.09	-.63	.52
<b>Screen</b>				
<b>Random Effects</b>	<b>Variance</b>	<b>SD</b>		
Participant	.57	.75		
Item	1.13	1.07		
<b>Fixed Effect</b>	<b><math>\beta</math> estimate</b>	<b>SE</b>	<b>z value</b>	<b>p value</b>
Intercept	-2.66	.81	-3.29	.001
Situational interest	.48	.12	3.82	<.001
Background knowledge	.18	.11	1.66	.10
Reading skill	.04	.02	2.88	.004
Individual interest	.08	.09	.88	.38

To examine the effects of medium on situational interest, a one-way ANCOVA with medium as the independent variable, situational interest as the dependent variable, and individual interest as a covariate was conducted. There were no reliable differences between medium for situational interest,  $F(1, 203) = .17, p = .68$  (adjusted  $M = 4.33, SE = .10$  for paper;  $M = 4.39, SE = .10$ , for screen). Individual interest was significant as a covariate,  $F(1, 203) = 14.26, p < .001$ .

### **Discussion**

The findings from this study indicated that individual interest did not predict performance on the reading assessment. This was unexpected given that previous research findings have shown that individual interest in a text is usually predictive of performance for reading that text (Clinton & van den Broek, 2012). One possible reason for the findings in the current study could

be that the participants may have interpreted the items asking about interest in marriage and family structures to be about interest in how individual families functioned rather than how such structures were categorized in a sociological context. Therefore, it is possible the interest reported by participants may not have been relevant to the content of the text they read. However, this is only conjecture and there are no data to test this claim. For this reason, it is unclear whether individual interest would interact with medium in other content areas.

Situational interest interacted with medium to be more predictive of performance when reading from screens than from paper. Although not directly tested in this study, it is possible that situational interest assisted readers with better engagement and more pleasant affective experience that was more important when reading from screens than paper. This study did not address the mechanisms for why this finding occurred, but future studies could examine how exactly situational interest functions differently with screens, assuming this finding is replicated and generalized. These findings may inform an emerging integrative framework on digital literacies (Mangen & van der Weel, 2016) as well as practical implications for enhancing situational interest to improve performance when reading from screens.

However, any potential affective issues related to reading from the screen did not influence the situational interest evoked by the text. It is possible the screen did not disrupt reading in a manner that would have prevented readers from having their situational interest in the text sparked. These findings are useful in knowing that reading this study's text from a screen did not appear to have any deleterious effect on situational interest for that text.

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