



To Evaluate or to Justify: Do Readers Become
Less Likely to Construct a Documents Model
After Choosing a Side Among Conflicting
Science Texts?

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Title: To evaluate or to justify: Do readers become less likely to construct a documents model after choosing a side among conflicting science texts?

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Abstract

One-hundred and thirteen undergraduates read and recalled two opposing documents on the use of opioids to treat chronic pain. One third were instructed to summarize the texts, another third to evaluate the claims, and the last third to evaluate their personal agreement with the texts. The results suggest that the instructions may have affected the writing task, but not the underlying representation of texts in memory.

Keywords

Multiple text, evaluation, documents model, biased model

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Socio-scientific controversies, such as the opioid crisis, the genetic manipulation of embryos, or identifying the best ways to stop the spread of highly contagious diseases tends to highlight disagreements among experts and requires people to read multiple documents to obtain a full understanding. Multi-text comprehension involves going beyond the situation depicted in isolated texts to construct a *documents model* (Britt et al., 1999) (i.e., an integrated model of the different texts together with the sources of those texts). In truth, however, a reader's actual representation can vary with respect to how well the information from the texts is integrated—ranging from a “mush model”, in which contents from multiple texts are fully integrated, without regard to sources, to completely separate representation models, in which each text may be linked to its source, but remains unintegrated with the other text(s) (Britt et al., 1999).

This variation is contingent upon strategic factors (e.g., Britt et al., 2018). For example, instructing participants to produce an argument after reading a set of texts usually leads to documents model construction, as compared to instructing them to produce a summary (Wiley et al., 2018). At the same time, multi-text representations can be influenced by less strategic determinants, such as when the content aligns with a reader's prior attitudes and beliefs. In these cases, a so-called *text-belief consistency* effect is observed, whereby the reader builds a biased or one-sided model, with more information consistent with their own beliefs, instead of a rather balanced, multi-perspective model (Richter & Maier, 2017). The text-belief consistency effect presupposes the existence of prior beliefs about which perspective is true or more acceptable. However, it is unclear whether it can be observed immediately after a reader expresses agreement with a perspective for the first time.

This study examined whether an evaluation task could induce readers without a prior belief on a topic to construct a more or less balanced multi-text representations after reading two opposing texts on the use of opioids to treat chronic pain. In line with prior research (Wiley et al., 2018), we hypothesized that readers would more likely produce a documents model when prompted to evaluate the claims than when prompted to summarize the texts. Additionally, we predicted that readers would produce more one-sided representations and would show less memory for text contents and sources (in a latter memory task) when prompted to evaluate their personal agreement with the texts.

Method

Participants

One-hundred and thirteen Psychology undergraduates from two South American universities with no prior opinion on the topic (Age $M:20.59$, $SD=2.95$; 85% female) volunteered for course credits.

Materials and design

Two conflicting science texts from a Psychology textbook (Smith et al., 2003), dealing with the use of opioids to treat chronic pain (one advocated for its use and the other was against it) were adapted in length (304-333 words), readability (moderate difficulty) and structure (four paragraphs per text presenting eight idea units). Each text was accompanied by information about its author (in bold, above the text). Both authors were presented as trustworthy (i.e., expert and benevolent) scientists and described through name, position, workplace, and achievements.

Participants were randomly assigned to one of the three Task Instructions: summarizing (summarize condition, $n=37$), evaluating the texts' claims (document evaluation condition, $n=38$), or evaluating the personal agreement with the texts (agreement

evaluation condition, $n=38$). The exact instructions were (manipulation in italics): “Your task now is to *describe and summarize what you just read / evaluate and explain the claims you just read / evaluate and explain the agreement option you just marked*. You don’t need to use all the information, but your response should be based on what you read. You can also give your opinion if you want, but do not use information other than what you read”.

The dependent variables were: a) the type of representation reflected in the written production, and b) the number of texts’ claims and source features recalled in a latter task. Written production coding adapted List et al.’s (2019) criterion. A production was classified as a “documents model” when it established connections between the two texts while also referring to the sources, as a “mush model” when it integrated/discussed information presented in both texts without tagging them to different sources, as a “separate representation model” when it presented text information sequentially without intertextual integration, or as a “one-sided model” when it presented contents from only one of the texts, with or without references to the source. The first three authors coded 15 % of the protocols independently and resolved disagreements by discussion. The first author classified the rest of the protocols.

The memory task consisted of recognizing which claim corresponded to each text (max. 8 points) and to recall the descriptions of the authors of each text (max. 8 points).

Indicators of self-reported topic knowledge (10-point scale: “How much do you know about the use of opioids to treat chronic pain?”, $M=1.72$, $SD=1.59$) and digital skills (Burin et al., 2016) were also collected for control purposes. These did not predict the outcomes and are not further considered.

Procedure

Participants first completed the prior-knowledge scale, reported whether they had an educated opinion on the use of opioids for the treatment of chronic pain (yes-no), and read a 145-words paragraph with definitions and basic information on pain and opioids. Then they read the texts and indicated their agreement with the texts (response options were “I agree more with text [A] ...with text [B] ... I equally agree with both texts). 80.4% of the participants sided with one of the two texts and 19.6% expressed equal agreement. No differences were found between conditions, $\chi^2(4)=7.66, p= .11$. Then, they were instructed for the writing task (depending on the experimental condition), completed the digital skill test, and finished by completing the memory task.

Results and discussion

Data were analyzed with logistic regressions (for Type of Representation) and ANOVAs (for memory measures) using IBM SPSS 24.

Written productions

The overall contribution of Task Instructions was significant, $\chi^2(6)=77.72, p< .001$ (see Figure 1). In line with prior research (e.g., Wiley et al., 2018), the document evaluation condition was more likely to produce documents models than the other two groups [summarize: $OR=5.12, CI_{95\%} (1.92, 13.68)$, agreement evaluation: $OR=17.69, CI_{95\%} (5.95, 52.59)$]. Also as expected, the agreement evaluation group produced more one-sided representations than the other two groups (summarize: $OR=61.71, CI_{95\%} [7.60, 500.69]$; document evaluation: $OR=3.08, CI_{95\%} [1.72, 5.51]$).

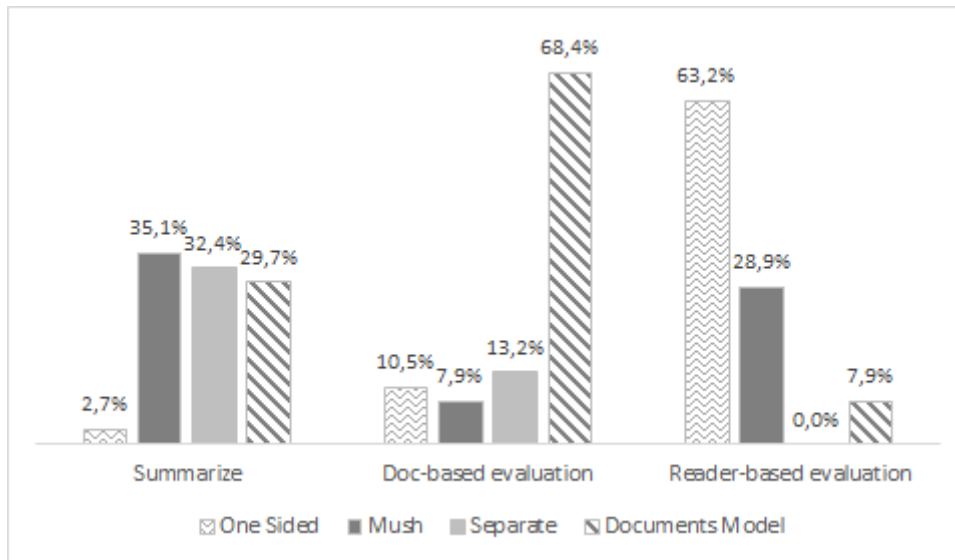


Figure 1.
Written production types as a function of Task Instructions

Although not included initially in the coding criteria, we also counted the number of unwarranted information included in the written productions (i.e., information that was not derived from the texts, such as personal experiences, speculations on how people suffering from chronic pain must feel, etc.) as a supplementary indicator of performance. Unwarranted additions concentrated heavily in the reader-based evaluation group, $M=1.42$, $SD=1.29$ (summarize group: $M=0.05$, $SD=0.23$; document-based evaluation group: $M=0.24$, $SD=0.71$), $F(2,110)=27.89$, $p<.001$. In 65% of the cases, this added information was fused with text claims by means of causal, contrastive, and additive connectors.

Memory task

Participants did very well at identifying text claims ($M=6.87$, $SD=1.21$) and poorly at recalling source features ($M=1.06$, $SD=1.45$), regardless of task instructions, $p<.69$.

To sum, after a common situation (i.e., reading and expressing agreement with two conflicting texts), participants produced different intertextual integrations as a function of the writing instructions they received. The evaluation of texts claims lead to documents model-type of productions, whereas the evaluation of the personal agreement lead to one-

sided productions. This tended to include unwarranted information, even after explicitly reporting no prior opinions nor knowledge on the subject. However, the lack of differences on the memory task suggests that the manipulation may have affected the writing task, but not the underlying representation of the texts. Alternatively, the memory task may have lacked sensitivity, being either too easy (i.e., recognizing text claims) or too difficult (i.e., recalling source descriptions). A follow-up study is planned to clarify this last point.

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