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Opening the Closed Mind: The Effect of Exposure to Literature on the Need for Closure

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The need for cognitive closure has been found to be associated with a variety of suboptimal information processing strategies, leading to decreased creativity and rationality. This experiment tested the hypothesis that exposure to fictional short stories, as compared with exposure to nonfictional essays, will reduce need for cognitive closure. One hundred participants were assigned to read either an essay or a short story (out of a set of 8 essays and 8 short stories matched for length, reading difficulty, and interest). After reading, their need for cognitive closure was assessed. As hypothesized, when compared to participants in the essay condition, participants in the short story condition experienced a significant decrease in self-reported need for cognitive closure. The effect was particularly strong for participants who were habitual readers (of either fiction or non-fiction). These findings suggest that reading fictional literature could lead to better procedures of processing information generally, including those of creativity.

The need for cognitive closure is a need to reach a quick conclusion in decision-making and an aversion to ambiguity and confusion. It encourages “seizing” on an early statement or proposition in the process of acquiring knowledge, followed by rigidly “freezing” on the seized item, and remaining impervious to additional information (Kruglanski & Webster, 1996, p. 265). Two general properties of this need are an urgency to reach a conclusion, and a rigidity or *viscosity* of the conclusion that is reached.

Heightened need for closure, which causes reliance on early information cues and a corresponding reduction in internally generated hypotheses (Mayselless & Kruglanski, 1987), is among the biases that have been posited as impedances to rationality (Stanovich, West, & Toplak, 2011). Paradoxically, the smaller the number of alternative hypotheses, the greater is the thinker’s confidence in their validity (Kelley, 1971; Kruglanski & Webster 1991, Webster, 1993). The quality of the subjects’ information also suffers, because the pressure of

seizing causes one to seek more prototypical information about categories, rather than diagnostic information that enables one to differentiate among categories (Kruglanski & Mayselless, 1988; Trope & Bassok, 1983). Furthermore, heightened need for cognitive closure seems to lead to a preference for considering smaller amounts of information before making final decisions (Choi, Koo, Choi, & Auh, 2008; Ford & Kruglanski, 1995; Houghton & Grewal, 2000) and a reliance on simple, rather than complex, cognitive structures when interpreting or making sense of that information (Van Hiel, 2001; Van Hiel & Mervielde, 2003).

It is not only rationality, but creativity as well, that is impeded by the heightened need for closure. Research has shown that individuals high on the need for closure produced objects and figures that were judged to be less creative by independent judges than individuals who are low in the need for closure (Rocchi, 1998). In a group setting, both situational manipulation of need for closure (through time pressure) and individual differences in the need for closure lead to less creativity and ideational fluidity (Chirumbolo, Livi, Mannetti, Pierro, & Kruglanski, 2004). If having a closed mind can affect both rationality and creativity, the question becomes: Can anything be done to reduce the need for cognitive closure, and help open the closed mind?

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This article deals with whether reading fictional literature can affect the need for cognitive closure. The framework here is built on the insight that fictional literature can be conceptualized as a cognitive and emotional simulation in which the travails of fictional characters are run on minds and brains, as a computer application runs on a computer's operating system and hardware (Oatley, 1999). Although cognitive processes involved in reading fiction are very similar to cognitive processes in everyday life (Gerrig, 1998), the two differ in important ways. Unlike in everyday life, the thinking a person engages in while reading fiction does not necessarily lead him or her to a decision, and therefore has tendencies neither of urgency nor permanence that propel the need for cognitive closure. Furthermore, while reading, the reader can simulate the thinking styles even of people he or she might personally dislike: One can *think along* and even *feel along* with Humbert Humbert in *Lolita*, no matter how offensive one finds this character. The kind of thinking that persons do while reading simulates thinking in real life so closely that Zwann (2004) hypothesized that reading automatically activates neural events similar to those occurring in the lives of the characters one reads about. This double release—of thinking through events without concern for urgency and permanence and thinking in ways that are different than one's own—may produce effects of opening the mind.

One question tackled in this study is whether reading nonfictional texts such as essays has effects on belief processing that are different from those of reading fictional texts such as short stories. In both cases, a reader tries to understand another's thinking (and feeling). The difference, though, is that in nonfiction there is a clear delineation between the author's and the reader's opinions, such that the reader is either persuaded or not by the author's arguments and stances. With nonfiction, changing or not changing the content of one's belief system is still bound by permanence and, in at least some cases, by urgency, because one's opinion, once settled upon, can have implications for decision making. The content of one's belief system may change, but meta-cognitive processes may be unaffected. With fiction it was hypothesized that there may be greater flexibility of a meta-cognitive kind. It was previously found that whether a text was nonfiction or fiction made no difference to whether changes occurred in participants' self perceived personality when they read the text; only the text's artistic level affected personality (Djikic, Oatley & Carland, 2012). In this article, there is a different, meta-cognitive question in relation to beliefs. Is fiction, specifically, able to open closed minds?

A second question tackled is whether, as compared with reading a nonfictional essay, reading a fictional short story would have a stronger effect when habitual nonfiction readers are asked to read it, because they

would thereby be introduced to a nonhabitual manner of thinking, or whether, on the contrary, the effect may be stronger for habitual fiction readers.

Both these questions are tested in this study. Participants were asked to read either an essay or a short story, chosen from a set that was controlled for length, complexity, and interest level. Also measured was the amount of nonfiction and fiction that participants engaged in reading habitually. The first hypothesis was that, as compared with those who read an essay, participants who read a fictional story would show reduced need for cognitive closure, and the second hypothesis was that there would be differences in this effect as a function of whether people tended habitually to read more non-fiction or fiction.

METHOD

Participants

One hundred¹ university students at the University of Toronto participated in the experiment (69 women). The age range for the participants was between 18 and 53 ($M = 21.7$, $SD = 5.74$). The average number of years participants spent speaking English in English-speaking environment was between 4 and 53 ($M = 17.8$, $SD = 6.98$). No data on ethnic or racial belonging were collected. The campus, located in downtown Toronto, is highly multicultural. Participants were recruited through posters that were posted on bulletin boards all across University of Toronto (libraries, classrooms, social spaces), in which they were offered \$20 to participate in a study. Interested participants were instructed to contact the experimenters through e-mail. Participants were treated in accordance with American Psychological Association and Canadian Psychological Association's ethical standard for treatment of human participants.

Instruments

Demographics questionnaire Participants were asked for their gender, age, and number of years they had spent speaking English in English-speaking environments.

Author Recognition Test—Revised (ART-R; Mar, Oatley, Hirsh, dela Paz, & Peterson, 2006). The original version of the ART questionnaire was designed by Stanovich and West (1989), and it offers a good measure of exposure to print during a participant's lifetime. ART

¹Please note that effective sample sizes in statistical analyses were smaller because some of the participants did not successfully complete the experimental manipulation (reading of the text).

predicts reading comprehension and oral language skills (Mol & Bus, 2011); it correlates with diary-based and other measures of reading (Allen, Cipielewski, & Stanovich, 1992) and also correlates with direct behavioral measure of reading behavior (West, Stanovich, & Mitchell, 1993). Respondents are asked to check off from a list of names those they recognize as authors. Guessing and social desirability effects are discouraged by letting the respondents know that some names are not authors (they are foils). Mar et al. (2006) revised the original ART to include 50 writers of fiction only, 50 writers of nonfiction only, and 40 foils. Four participants who checked more than two foils were excluded from analyses.

Type of writing: Essays and short stories. Essays and short stories were chosen from anthologies. For the most part, they were from the first half of the 20th century. The criteria for inclusion were that they had to be around 6,000 words, a length that was successfully used previously in a study of reading fiction (Djikic, Oatley, Zoeterman, & Peterson, 2009b). They were by known authors. Essays and short stories were chosen so that the subject matter varied across the chosen set. The authors and titles of essays and stories are presented in Table 1. The readability (level of reading difficulty) of each text was measured by the Flesch-Kincaid Grade Level score. This score is calculated for a text by the following formula: $(.39 \times ASL) + (11.8 \times ASW) - 15.59$, where ASL is average sentence length (the number of words divided by the number of sentences), and ASW is average number of syllables per word (the number of syllables divided by the number of words). The greater the reading difficulty the higher the grade level (thus, children in higher grades at school can read more difficult texts).

In their original form, the essays generally had longer sentences and more polysyllabic, rare words than short

stories. This meant a potential presence of a confounding variable. If the readability of the essays and short stories were not the same, it would be impossible to know whether any experimental effect was due to the exposure to the variable of essay versus short story or to the exposure to the text of higher versus lower readability. Given that making essays more readable could be done less invasively than making short stories less readable, the essays were modified. Modifications were undertaken to reduce the overall length of some of them, and to increase their readability until, overall, the eight essays were of the same average length and in the same range of Flesch-Kincaid readability scores as the eight short stories. The readability was increased in three ways: long sentences were divided, low frequency words were replaced with more common synonyms, and complex syntax was simplified. The short stories were left unmodified.

Need for Closure Scale (NFCS; Kruglanski, Webster, & Klem, 1993). This 42-item scale measures the need for closure across five different subscales: preference for order and structure (e.g., “I think that having clear rules and order at work is essential for success”); discomfort with ambiguity (e.g., “I don’t like situations that are uncertain”); decisiveness (e.g., “I would describe myself as indecisive”); predictability (e.g., “I like to have friends who are unpredictable”), and closed-mindedness (e.g., “I dislike questions which can be answered in many different ways”). Past research indicated that the NFCS has excellent convergent and discriminant validity, with test-retest reliability of .86, and high internal consistency, with Cronbach’s alpha of .84 (Webster & Kruglanski, 1994).

Procedure and Manipulation Checks

Procedure. Participants were ushered into a cubicle and seated at a desk. They were given a package to complete. First, they completed seven questionnaires, including the demographics questionnaire and the ART-R. Then, they were asked to read either an essay or a short story. After answering content questions about the text they had read, and rating it on how artistic and interesting they found it, participants filled out another set of eight questionnaires, which included the NFCS. It was hoped that the multiplicity of questionnaires, both before and after participants had read the text, would mask the purpose of the experiment and prevent demand characteristics. Participants were then fully debriefed and received \$20 for their participation.

The participants, instruments, and procedure for this study were the same as those described by Djikic, Oatley and Carland (2012), but in our study data was analyzed on a different outcome variable than previously: the NFCS.

TABLE 1
Essays and Short Stories Used in the Experimental Procedure

<i>Essays</i>	<i>Short Stories</i>
Henri Bergson: <i>Why Do We Laugh?</i>	Paul Bowles: <i>The Echo</i>
John Burroughs: <i>Science and Literature</i>	Katherine Brush: <i>Night Club</i>
Havelock Ellis: <i>What Makes a Woman Beautiful?</i>	Frank O'Connor: <i>My Oedipus Complex</i>
Sigmund Freud: <i>Dreams of the Death of Beloved Persons</i>	Jean Stafford: <i>A Country Love Story</i>
John Galsworthy: <i>Castles in Spain</i>	Jean Stafford: <i>In the Zoo</i>
Stephen Jay Gould: <i>Nonmoral Nature</i>	Wallace Stegner: <i>Beyond a Glass Mountain</i>
George Bernard Shaw: <i>Killing for Sport</i>	Clark van Tilburg: <i>The Wind and Snow of Winter</i>
Rabindranath Tagore: <i>East and West</i>	Glenway Wescott: <i>Prohibition</i>

Reading and Content Check

Each participant was randomly assigned to read either an essay or a short story, each of which bore the heading of its title (but not author). After reading, each participant was given five short questions about the text's content to test whether he or she had read and understood the text. The questions were factual rather than interpretative. Six participants got three or more answers of the five incorrect; they were considered not to have read the text in its entirety and were excluded from statistical analyses.

Level of Interest and Artistic Merit

Following reading of the text, participants were asked to report how interesting and how artistic they found the text, on Likert scales from 0 to 10 (0 = *not at all*, 10 = *extremely*). The measure of level of interest was necessary to ensure that one set of texts—essays or stories—was not systematically more interesting than the other. The measure of artistic merit was included to tell whether any effects were due to the sheer fact of the text being nonfiction or fiction, or whether it could be due to the artistry of the writing.

Completion of the NFCS

After they had completed the scales of level of interest and artistic merit, participants completed the NFCS. To protect against the social desirability bias, an additional 5-item lie scale was included (e.g., "I have never known someone I didn't like"); 7 participants scored over 15 on this scale, and their data were not used in the analyses. Overall, 13 participants (6 who did not demonstrate they had read the text, and 7 who scored to high on the lie scale) were excluded from analyses.

RESULTS

To test whether there are any potential confounds regarding length and the complexity of essays and short stories, *t*-tests were conducted. There was no significant difference between the average length of short stories ($M_{ss} = 5,616$, $SD_{ss} = 1,525$) and essays ($M_e = 5,088$, $SD_e = 1,137$), $t(14) = .79$, $p = .45$, and no significant difference in readability, as measured by Flesch-Kincaid Grade Level, $t(14) = -.04$, $p = .97$ ($M_{ss} = 7.2$, $SD_{ss} = 1.7$; $M_e = 7.2$, $SD_e = .62$).

To test whether there were significant differences in level of interest and artistic merit between essays and short stories, a one-way ANOVA was conducted, and it showed no significant difference between the groups of those who read an essay and those who read a short

story, $F(1, 85) = .92$, $p = .34$ (level of interest), and $F(1, 85) = .39$, $p = .53$ (artistic merit). The potential confound of the participants finding either essays or short stories more interesting or artistic was thus avoided.

Finally, a reliability analysis for NFCS showed Cronbach's alpha value as .77 for the entire scale. Alpha values for the subscales were .74 (order), .78 (predictability), .72 (decisiveness), .62 (ambiguity), and .56 (closed mindedness).

To test the central hypothesis, a univariate analysis (general linear model) was conducted, with type of writing (essay or short story) as a fixed factor, and level of interest and artistic merit as covariates. Type of writing was found to be a significant predictor, $F(1, 83) = 4.21$, $p < .05$, $R^2 = .10$. That is to say, as compared with those who read an essay ($M = 3.97$, $SD = .44$), participants who read a short story had significantly lower scores on the NFCS ($M = 3.79$, $SD = .37$); $t(85) = -2.13$, $p < .05$. This decrease in the need for cognitive closure was effected mainly by the decrease in the two subscales of the NFCS, need for order, $t(85) = -2.22$, $p < .05$ (one-tailed), and discomfort with ambiguity, $t(85) = -1.87$, $p < .05$ (one-tailed). Difference on other subscales did not reach significance.

Neither of covariates reached significance, though there appeared to be trends: $F(1, 83) = 3.73$, $p = .06$ for level of interest, and $F(1, 83) = 2.49$, $p = .12$ for artistic merit. Pearson's bivariate correlation between the need for closure and level of interest, $r(85) = -.17$, $p = .11$, and between the need for closure and artistic merit was $r(85) = .08$, $p = .47$.

The means and standard deviations for ART were $M = 4.59$, $SD = 4.40$ for nonfiction and $M = 6.41$, $SD = 7.62$ for fiction. Nonfiction and fiction scores were significantly positively correlated, $r(85) = .72$, $p < .01$, and this confirms previous findings (Mar et al., 2006) that people who read a lot of non-fiction also tend to read a lot of fiction.

To test the second hypothesis, a median split was performed such that those who scored above the median on ART-nonfiction were classified as *high nonfiction readers*, and those who scored below the median as *low nonfiction readers*. Low nonfiction readers did not differ from high nonfiction readers in need for closure when they read an essay, but there was a significant difference when they read a short story: $t(41) = -2.21$, $p < .05$, such that high nonfiction readers showed lower need for closure than low nonfiction readers.

A similar classification was made into *high-fiction readers* and *low fiction readers*, for those scoring above and below the median, respectively. As in the previous analysis, although there was no significant difference between the groups for those who read an essay, high fiction readers (as compared with low fiction readers) who read a short story had a lower need for closure,

$t(41) = -2.59, p < .05$. It appears that high readers (of both nonfiction and fiction) benefited from reading a short story rather than an essay, in terms of lowering their self-reported need for closure.

DISCUSSION

The principal hypothesis was supported. When compared to reading an essay, reading a literary short story led to a significant short-term decrease in participants' self-reported need for cognitive closure. The effect did not depend on the artistic properties of the text (some essays were judged more artistic than some short stories), but on the genre—the type of writing—of the text that was read: essay or short story. When one reads fictional literature, one is encouraged to simulate other minds, and is thereby released from concerns for urgency and permanence. As was found in testing the subscales of the NFCS, this occurred principally by means of a decreased need for order and a decreased discomfort with ambiguity.

Since only short-term decreases on the need for closure were produced, it is reasonable to ask whether the suspension of urgency and permanence that reduced the need for cognitive closure ends as soon as one closes a book and returns to an everyday life that requires quick opinions and decision making. The next step in the investigation of this phenomenon will be to find how long the single-exposure effect lasts, and, if steady-state changes can be induced, how much exposure to literature is needed to achieve long-term decreases. In taking this next step, it should also be investigated whether and how far a decreased need for closure that follows exposure to literary fiction generalizes to a greater openness of mind when faced with problems of reasoning or creativity.

From the simulation perspective, the decrease in the need for closure may depend on the same meta-cognitive processes that usually make opening the mind so difficult. Reading fiction often prompts one toward thinking from a different perspective, from the point of view of (at least one) other person. It is likely that only when experiences of this kind accumulate to reach some critical mass would they lead to long-term changes of meta-cognitive habits. Given the suboptimal information-processing strategies that result from premature need for closure, exposure to literature may offer a pedagogical tool to encourage individuals to become more likely to open their minds.

There are two additional potential benefits of reading fiction as a systematic way of opening minds. Experiential and practice strategies with a potential to change meta-cognitive processes, as shown by Arkes, Christensen, Lai, and Blumer (1987) and Arkes, Faust, Guilmette,

and Hart (1988), involve manipulating situations in ways that are labor and time intensive for trainers. By contrast, literary fiction can be read in participants' own time, and only occasional encouragement may be needed. A second benefit is that reading fiction can affect even individuals with highly developed cognitive mechanisms of defense against anxiety (Djikic, Oatley, Zoeterman, & Peterson, 2009b). The effect may occur because it does not rely on confrontational or instructive methods. When reading about fictional characters, one does not feel the need of defend one's own perspective. One can simulate the workings of other minds without the fear of undermining one's own.

An additional result suggested by this experiment is that it is the most frequent readers (of both nonfiction and fiction) who are likely to experience the most beneficial effects of exposure to literature. This is encouraging with regards to pedagogical interventions in professions such as law, medicine, and business, in which training demands extensive nonfiction reading, but at the same time requires people to become insightful about others and their perspectives. Although nonfiction reading allows students to learn the subject matter, it may not always help them in thinking about it. A physician may have an encyclopedic knowledge of his or her subject, but this may not prevent the physician from seizing and freezing on a diagnosis, when additional symptoms point to a different malady (Groopman, 2008). There is a small literature on the influence of premature closure on decision-making in medical diagnosis (Warner, Najarian, & Tierney, 2010), and police investigation (Häkkinen, Ask, Kebell, Alison, & Granhag, 2009). It highlights closure effects that may be beneficially addressed through exposure to fictional literature, which can balance practitioners' extensive content knowledge with the development of meta-cognitive habits that favor improved information processing, so this, in turn, may have applications in professional fields.

CONCLUSION

It is hoped that this experiment will stimulate further investigation into the potential of literature in opening closed minds, as well as give one a pause to think about the effects of current cut-backs of education in the arts and humanities. In ancient Greece, all students, no matter their future profession, had to know Homer by heart. The method may seem outdated, yet one may still wonder how such an immersion in literature may have contributed to the education of philosophers, mathematicians, and writers who, although separated from present time by two-and-a-half millennia, developed minds whose supple and agile turns are still admired.

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