



## Externalizing behaviors and learning from text in primary school students: The moderating role of mood



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### ABSTRACT

Previous research indicates that externalizing problems and negative mood can impair learning. However, the interaction between these variables in predicting learning from text is not well understood. This study examined the moderating role of negative mood in the association between externalizing behaviors and learning from text in primary school children.

Fifth graders ( $N = 160$ ) were randomly assigned to either a negative or a neutral mood condition. Students were mood-induced by watching a video-clip. Subsequently, they read a text, answered a post-reading knowledge question, and reported on their externalizing behaviors.

Ordinal logistic regression and simple slope analysis revealed that more externalizing behaviors were related to poorer learning gain in students in the negative mood condition, but not in those in the neutral mood condition. These results show that negative mood moderates the effect of externalizing behaviors on learning from text, thus giving important hints for practice in educational settings.

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### 1. Introduction

The ability to acquire knowledge from a written text is central to successful learning in most, if not all, academic subjects. The comprehension of an informational text results from the reading process as well as from the reader's skills and characteristics. Moreover, the link between reading achievement and behavioral problems is well documented (Cain & Bignell, 2014; Gray, Carter, Briggs-Gowan, Jones, & Wagmiller, 2014; Sarver et al., 2012), and estimates of co-occurrence between externalizing behaviors and academic underachievement in school-age children can reach 50% (Gray et al., 2014). Early externalizing problems play a particularly important role in the emergence of reading difficulties and in the development of learning from texts skills in the school years (Gray et al., 2014). The reciprocal effects between externalizing behaviors and academic achievement can be moderated by students' characteristics, such as self-esteem (Zimmermann, Schütte, Taskinen, & Köller, 2013). However, with very few exceptions (Bohn-Gettler & Rapp, 2011; Broughton, Sinatra, & Nussbaum, 2013), little attention has been devoted to the influence of affective states, which lie outside of explicit control, on students' ability to read and comprehend a text. To our knowledge, no previous study has investigated the role of everyday mood variations in the relation between externalizing behaviors and learning from text.

In this study, we focused on students at the end of their primary education. This period is particularly interesting because at this

age, students prepare themselves to enter a period of major transitions characterized by greater requests in academic efforts (i.e., transition to secondary school) and striking body and behavioral changes (i.e., onset of puberty). The presence of changes, challenges, or stressors at this stage of the child's life may accentuate or trigger externalizing behaviors, which can seriously affect learning in this phase of students' academic path (van Batenburg-Eddes & Jolles, 2013).

Student misbehavior and conduct problems in the classroom represent a common experience in everyday school life and are a frequent cause of concern for parents and teachers. These externalizing behaviors only in rare exceptions are of clinical relevance; more often they represent a phase of transitional development. Yet, there are important individual differences, and while some students experience only sporadic or transitory externalizing problem behaviors, others engage in these acts more frequently and may face emotional and learning consequences (Breslau, Breslau, Miller, & Raykov, 2011; Gray et al., 2014). In the long term, externalizing problem behaviors can lead not only to low engagement in academic activity, but also to school drop-out and low achievement in postsecondary education (Finn, Fish, & Scott, 2008).

In daily life, students are continuously facing learning tasks and activities in various moods (Pekrun & Linnenbrink-Garcia, 2014). It is a common experience for students having to read a text or a sentence again because their emotional state affects the ability to process and comprehend the written material. In recent years, the influence of emotion on learning has been empirically investigated through experimental studies based on mood induction, which addressed the effects of mood on cognitive processing.

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Research has shown that normal mood fluctuations may positively affect, impair, or have no effect on different aspects of cognition (e.g., Mitchell & Phillips, 2007; Yang & Yang, 2014). Studies using negative mood induction show that a negative emotional state is associated with a reduction in cognitive functioning (Brand, Reimer, & Opwis, 2007; Scrimin, Mason, & Moscardino, 2014), which may be explained by a reduction of information processing capacity (Ellis & Ashbrook, 1988). More specifically, recent studies have focused on the effects of mood on various learning performances (Brand et al., 2007; Bohn-Gettler & Rapp, 2011). For example Brand et al. (2007) have shown that negative mood impairs transfer effects and learning, while Bohn-Gettler and Rapp (2011) found that happy-induced participants generated more text-based inferences while reading texts, compared with sad and neutral-induced students. In our own work, we also recently found that undergraduate students in a negative mood processed and comprehended a scientific text worse than students in a positive or neutral mood (Scrimin & Mason, 2015).

Hence, externalizing behaviors and normal mood variations have separately been shown to affect learning from text. However, whether these variables can influence each other and, in turn, affect the process of learning from a written text, has yet to be investigated.

The aim of the present study was to examine the relationship between externalizing behaviors, negative mood, and learning from text. Based on the extant literature, we expected students in a negative mood to acquire less knowledge from a written informational text compared with students in a neutral mood. We also hypothesized to find a negative association between externalizing behaviors and learning from text. Furthermore, we examined the possible moderating role of negative mood in the link between students' externalizing behaviors and learning from text. Given the lack of studies on this issue, no a priori hypothesis was formulated.

## 2. Method

### 2.1. Participants

Participants were 160 (74 male) primary school students attending 5th grade (age:  $M = 10.14$ ;  $SD = .35$ ). Students were recruited through local primary schools in a middle-sized town located in northeastern Italy. All students were Italian first language speakers and had no certified learning disorders. Most students were from middle class families and reported a moderate (24.5%) or high (75%) score on the Family Affluence Scale (FAS; Boyce, Torsheim, Currie, & Zambon, 2006), with an overall mean score of 6.58 ( $SD = 1.50$ , range 3–10). Parents' average years of schooling were 13.48 years ( $SD = 2.94$ , range = 8–20), with 79.1% of mothers reporting they were employed outside the home. Participants were randomly assigned to either a Negative ( $n = 80$ ) or a Neutral ( $n = 80$ ) mood induction condition. Parental written permission (students brought the letters home from school) and child verbal assent were required for participation; in addition, written informed consent was obtained from school principals. The study was also approved by the Institutional Review Board.

### 2.2. Reading material and learning measures

The text described in 254 words (in Italian) how a suction cup works and the role played by air pressure, also with the support of an image.

Knowledge about the working mechanism of a suction cup at pretest and posttest was assessed through a written explanation: "How would you explain to a child of your age why a suction cup remains attached to the wall?". Explanations were scored from 0 to 3 according to their degree of correctness and completeness. Examples of coding were as follows: a. "When we press the suction cup against the wall, you squeeze out the air from under it. Then, the rubber that the cup is made out of tries to return to its original shape. This causes an area of lower pressure under the cup, and the higher external atmospheric

pressure pins it to the window" (scored 3); b. "When we squeeze the suction cup against the wall all the air comes out from under it. Then this air is responsible for keeping the cup glued to the wall" (scored 2); c. "When you press the suction cup against the wall, the air comes out and the cup remains glued to the wall" (scored 1); and d. "The air between the suction cup and the wall keeps the cup glued to the wall" (scored 0). All answers were scored by two independent raters who were blind to the participants' mood induction condition. Interrater reliability was .90 at pretest, and .88 at posttest, as revealed by Cohen's  $k$ . Disagreement was resolved through discussion.

### 2.3. Externalizing problems

Students' externalizing problems were measured via the Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997). The SDQ is a 25-item questionnaire measuring children's hyperactivity, conduct problems, emotional problems, problems with peers, and prosocial behavior. Items are scored on a 3-point scale, with 0 = not true, 1 = somewhat true, and 2 = certainly true. A total difficulties score can be generated by the sum of scores from all the scales except the prosocial scale (Goodman, 1997). Goodman, Lamping, and Ploubidis (2010) recently reported theoretical and empirical support for combining the SDQ's emotional and peer subscales into an 'internalizing' subscale, and the behavioral and hyperactivity subscales into an 'externalizing' subscale. Because we were interested in studying hyperactivity and behavioral problems, in this study we used the externalizing subscale. In the current sample, the internal consistency coefficient for this scale, measured through Cronbach's Alpha, was .79.

### 2.4. Mood induction procedure and mood measure

#### 2.4.1. Mood induction

To induce negative and neutral moods, participants viewed a 12-min video clip containing three scenes from child-animated cartoons or documentaries. Specifically, students in the negative mood group viewed three sad four-min clips derived by Disney animated cartoons: "Bambi", "The Lion King", and "Red and Toby". It should be noted that in the negative mood induction video, we choose to include parts of well-known cartoons in order not to expose children to particularly disturbing scenes. Participants in the neutral condition viewed three four-min clips with National Geographic documentaries on the formation of glaciers, the prairie's plant life, and the stalagmite process of formation. This procedure is similar to the one used in numerous studies that have elicited a mood with video-clips (e.g., Mitchell & Phillips, 2007; Scrimin et al., 2014).

#### 2.4.2. Mood assessment

Before and after the mood induction procedure, participants completed the Positive and Negative Affect Scale for Children (PANAS-C; Laurent et al., 1999), a 30-item questionnaire assessing current mood (positive and negative affect) in children and adolescents. This scale requires participants to rate a series of adjectives describing how they feel at the moment (e.g., Positive—Enthusiastic, Negative—Afraid) on a 5-point scale ranging from 1 (not at all) to 5 (extremely). The list of emotional terms can be grouped into two subsets for assessing positive and negative affect. In the present sample, the alpha coefficient was .87 for the negative affect scale, and .84 for the positive affect scale.

### 2.5. Control variables

Other participant characteristics that could interfere with learning from text were also measured.

#### 2.5.1. Demographics

Students reported on their age and gender. In addition, family socioeconomic status was assessed via the Family Affluence Scale (FAS), a

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