



**Development and Initial Validation of a Questionnaire to  
Assess the Reading Beliefs of Undergraduate Students: The  
CCL**

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6 **Development and Initial Validation of a Questionnaire to Assess the Reading Beliefs of**  
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8 **Undergraduate Students: The CCL**  
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15 **Abstract**  
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17 The aim of this research was to develop a new questionnaire for exploring the reading beliefs  
18 of undergraduate students, since the only currently available instrument has conceptual and  
19 methodological limitations. The paper describes the process of developing the instrument and  
20 presents a range of psychometric data obtained from a sample of 558 Spanish undergraduates  
21 who were in the first or final year of a degree programme in psychology, language and  
22 literature, or engineering. The results provide evidence of the psychometric quality of items  
23 and reveal a dual structure of two and six factors, both obtained through exploratory and/or  
24 confirmatory factor analyses. Adequate reliability based on internal consistency of the factors  
25 was also demonstrated. As a measure of criterion validity, differences in reading beliefs by  
26 gender, academic year and knowledge area were also explored. The findings support the  
27 psychometric adequacy of this new instrument developed through an exploratory piece of  
28 research. Overall, the process of constructing the instrument and the results from this study  
29 provide a framework for research and intervention, in addition to presenting a tool that both  
30 researchers and teaching staff could use in the context of reading and reading comprehension.  
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## **Development and Initial Validation of a Questionnaire to Assess the Reading Beliefs of Undergraduate Students: The CCL**

Research on reading and academic literacy in the higher education context has contributed to a better understanding of the processes that students follow when required to read complex texts, as well as of the outcomes they achieve. One of the findings to emerge from this research is that undergraduates often have a relatively superficial grasp of the texts they need to read because of the inadequate way in which they approach the task. Specifically, the strategies they use may not be sufficient to engage in the in-depth reading and critical appraisal that is required to develop their knowledge of a discipline. While there are many variables that might explain why even good readers can find it difficult to understand and to know how to use course texts, the focus of the present article is on reading beliefs and the way in which reading is conceived. In what follows we analyse two different perspectives on reading and consider the concept of reading beliefs and the findings of empirical research that has examined it. This review of the literature justifies the development of a new questionnaire, the process of which is described later in the article. By helping to identify the reading beliefs of undergraduates and improving our understanding of how they approach the kinds of texts they must constantly work with, this new questionnaire should prove useful for both academics and professionals in the field. It will also offer a measure that can be considered in relation to students' reading comprehension performance and results. This knowledge could then be used to map out guidance for effective reading intervention.

### **Reading and Reading Comprehension**

The epistemic potential of reading, its capacity to produce deeper levels of understanding and learning, has not always enjoyed the recognition it does today (Olson,

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3 1994). Furthermore, it is clear from the contributions made with regard to conceptualization,  
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5 research, and practice in this field that reading can be conceived of in different ways (for a  
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7 review, see Pearson, 2009).  
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10 What is referred to as the *simple view* of reading and reading comprehension  
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12 (Hoffman, 2009; LaBerge & Samuels, 1974) establishes a direct and causal relationship  
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14 between the ability to decipher written language and the degree of understanding that is  
15  
16 achieved, since it is assumed that meaning lies within the text. This, then, is the element  
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18 regarded as most important in a reading process that would appear to be somewhat  
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20 mechanical, superficial, and reproductive, one in which the reader absorbs the meaning that  
21  
22 the writer sought to give to the text. From this perspective, the ability to understand texts  
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24 depends primarily on the capacity for fluent and automatic deciphering, and the extent to  
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26 which these skills can be applied to other texts will determine the reader's ability to  
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28 understand them.  
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34 This perspective has been criticized by various authors (e.g., Stahl & Hiebert, 2005;  
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36 Norris & Phillips, 2009) who adopt the postulates of cognitive research on reading, a  
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38 viewpoint that considers reading to be an intense intellectual activity involving not only the  
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40 text but also the knowledge schemas, expectations, and motivation of the reader (e.g., Adams  
41  
42 & Collins, 1979; ~~Authors, 1992;~~ Buehl, 2013; Pearson, 2009; Pressley & Gaskins, 2006; Solé,  
43  
44 1992; Van Dijk & Kintsch, 1983). Among the various contributions to this more complex  
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46 view of reading, the work of Norris and Phillips (2009) is of particular interest for its  
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48 exploration of the epistemic dimension of reading and its key role in the constitution of  
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50 scientific knowledge. Reading, for these authors, is *iterative*, recursive. It involves several  
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52 steps that lead to reading and re-reading, and each step may result in a more refined, complete,  
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54 and critical interpretation. Reading is also *interactive*, since it takes place in the interaction  
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56 between text and reader, whose prior knowledge, expectations, and motives come into play  
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3 here. Moreover, it is in this interaction that the reader encounters the evidence that will  
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5 enable him or her to corroborate or refute the interpretation that is made of the text. This is  
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7 because reading is *principled*; in other words, the reader, based on criteria of consistency and  
8  
9 globality, must choose the most plausible, complete, and consistent interpretation. As Norris  
10  
11 and Phillips (2009) point out, reading, from this perspective, is not merely the product of  
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13 certain skills, however sophisticated they may be. Rather, critical and epistemic reading  
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15 requires the reader to conceive of the text as an object that can be subjected to scrutiny and  
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17 critical analysis. Consequently, there is no single interpretation for literary, academic, or  
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19 scientific texts, and their meaning does not emerge from the text but is constructed by its  
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21 readers, who will do so in accordance with their own goals and knowledge, as well as on the  
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23 basis of the restrictions imposed by the text itself.  
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30 More than being a skill that can be applied once it has been acquired, reading is an  
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32 ability that is reconstructed in each situation. In fact, it is possible to speak of several levels  
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34 of reading competence, from the more executive and functional, to critical and epistemic  
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36 reading (Freebody and Luke, 1990). This gives rise to different ways of reading and  
37  
38 understanding, among which will be those that characterize a given community of readers  
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40 (Carlino, 2005), such as the members of a discipline, with their particular ways of generating  
41  
42 and sharing knowledge. At university, students are constantly asked to perform tasks that  
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44 require an in-depth and critical reading of texts so as to acquire meaningful learning, some of  
45  
46 which will require strategies to deal with multiple texts. Dealing with multiple texts involves  
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48 complex integration, sourcing, and corroboration processes, which make reading from several  
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50 sources a task that promotes constructive learning and not just memory of the texts (Goldman  
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52 et al., 2010; Perfetti, Rouet, & Britt, 1999; Willey & Voss, 1999). This kind of  
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54 comprehension implies that reading must be regarded as a way of thinking and of  
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3 transforming one's own knowledge, rather than as a means of reproducing existing  
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5 knowledge.  
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### 10 **Reading Comprehension and Reading Beliefs**

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12 Reading competence depends on different aspects, and research has sought to  
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14 determine how several factors affect comprehension. Some of these factors, such as prior  
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16 knowledge, text structure, the assigned task, or the use of different strategies, have been  
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18 widely explored (e.g., Bråten & Strømsø, 2010; Cerdán & Vidal-Abarca, 2008; Gil, Bråten,  
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20 Vidal-Abarca, & Strømsø, 2010a; 2010b; Gil, Vidal-Abarca, & Martinez, 2008; Kobayashi,  
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22 2009; Le Bigot & Rouet, 2007; Wiley & Voss, 1999), whereas others, such as reading or  
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24 epistemic beliefs, have only been examined more recently. Among the latter, reading beliefs  
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26 is the topic that has attracted the least attention.  
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32 The notion that beliefs play a role in comprehension is generally recognized by  
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34 theoretical perspectives and empirical studies that take a complex, lifelong learning view of  
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36 reading. From this perspective, it makes sense to consider the beliefs that students hold about  
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38 reading, as these beliefs will influence the way in which they approach texts (Norris &  
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40 Phillips, 2009; Simpson & Nist, 2000) and, consequently, the extent to which they understand,  
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42 transform, and use the information from sources.  
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46 The small amount of published research on reading beliefs has been conducted from  
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48 the perspective of implicit theories (Schraw & Bruning, 1996). This approach considers  
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50 beliefs as a system of representations that the reader has developed about reading and which  
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52 he or she applies unconsciously to the task; hence, these representations mediate the  
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54 relationship between reader and text. Due precisely to the implicit nature of beliefs this  
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56 approach proposes that they are best accessed via instruments that gather information  
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58 indirectly. For instance, studies of students' reading beliefs have used questionnaires based  
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3 on Likert scales, a type of instrument that is commonly used to investigate epistemological  
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5 beliefs (Schommer, 1998; 2004; Schraw, Bendixen, & Dunkle, 2002) and beliefs about  
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7 writing (Lavelle & Zuercher, 2001; Villalón & Mateos, 2009; White & Bruning, 2005).  
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10 Schraw and Bruning (1996) distinguished two implicit models of reading: the  
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12 transmission model and the transaction model. The transmission model views reading as a  
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14 one-way process in which the reader receives the author's intended meaning in the text,  
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16 thereby assuming the role of a passive reader who is barely involved in the reading process.  
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18 By contrast, the transaction model, based on Rosenblatt's reader-response theory (1978, 2004),  
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20 conceives of reading as a dynamic process in which the reader is actively involved in  
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22 developing a personal and complex representation of the text's meaning, a meaning that  
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24 already exists in the reader's mind and which must be actively constructed by establishing  
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26 relations between the text and the reader's own knowledge.  
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31 Based on these ideas Schraw and Bruning developed the *Reader Belief Inventory* (RBI;  
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33 Schraw & Bruning, 1996, 1999), to date the only instrument available for assessing reading  
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35 beliefs. The RBI comprises two scales corresponding to the two implicit models mentioned  
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37 above, and in its original version contains a total of 14 items that respondents must rate on a  
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39 5-point scale (from 1: *strongly disagree*, to 5: *strongly agree*). The results of Schraw and  
40  
41 Bruning's research showed that students who scored high on transaction beliefs achieved a  
42  
43 more holistic, personal, and sophisticated representation of the meaning of the text, and they  
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45 also included a wider range of critical arguments and personal reactions in a text they wrote as  
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47 a response to what they had read, in comparison to students with low transactional reading  
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49 beliefs.  
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54 Using an adapted 16-item version of the RBI, Schraw (2000) also found that  
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56 transaction beliefs, but not transmission beliefs, were associated with the construction of  
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58 personal meaning and better recall of the read text. Dai and Wang (2007) also used the RBI  
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3 with university students and confirmed some of the results reported by Schraw and Bruning,  
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5 for both narrative and expository texts. The authors concluded that transaction beliefs  
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7 predispose readers to take into account their personal experiences and prior knowledge when  
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9 reading, and also to engage more, both cognitively and emotionally, with the task; this has a  
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11 positive effect in terms of the comprehension that is achieved, whereas transmission beliefs  
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13 have a negative effect.  
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17 As a whole, these results indicate that students whose beliefs are consistent with the  
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19 more sophisticated transaction model actively engage with the reading process, achieve a  
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21 more integrated and holistic view of the text, and are also able to develop more critical  
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23 responses to it. By contrast, students who hold simpler, transmission beliefs engage less with  
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25 reading, are less questioning of the author's view, and recall more isolated and concrete  
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27 details of the text, leading them to a more superficial understanding of its content.  
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32 The few studies that have examined reading beliefs provide evidence to suggest that  
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34 they should be regarded as an important variable in relation to students' reading processes and  
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36 the level of comprehension they achieve. However, despite its contribution to research on  
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38 reading beliefs, the RBI has certain limitations that need to be addressed. In terms of  
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40 conceptual limitations, although the transmission model of beliefs fits fairly well with the  
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42 simple view of reading, the transaction model omits important features of the more complex  
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44 and widely accepted viewpoint, it being derived from a different theoretical perspective.  
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46 Since it draws conceptually on the postulates of Rosenblatt (1978; 2004) regarding literary  
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48 reading the transaction model is focused more on what the reader is feeling or experiencing in  
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50 relation to the text, rather than on the construction of meaning through interaction with the  
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52 text. Thus, the RBI considers aspects related to the message and the author's intentions, and  
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54 to the personal construction of the meaning of the text, but it omits other key elements such as  
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56 metacognitive aspects (i.e. awareness of reader's own cognitive processes, self-regulation) or  
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3 the mediated nature of reading (i.e., elaborating some kind of writing while reading, like notes  
4 or diagrams, as an aid for text comprehension). Furthermore, it only partially addresses not  
5 only the process through which reading is planned and meaning constructed, but also the uses  
6 and functions which reading may have; in fact, these aspects are addressed in greater detail  
7 from the transmission perspective on reading, but are given little attention in the transaction  
8 model. The fact that the instrument gives less weight to the transactional view of reading is  
9 important when one considers that this transaction model has been linked to the possibility of  
10 achieving a better understanding of written texts.  
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22 As for methodological problems, the first point of note concerns the lack of  
23 statistically significant results in the study by Schraw (2000) regarding the relationship  
24 between transmission beliefs and a measure of low-level reading comprehension based on  
25 recognition of main ideas. These findings were not consistent with previous results (Schraw &  
26 Bruning, 1996, 1999), and caution should therefore be exercised when assessing the  
27 conclusions drawn by this study. Second, the internal consistency results from the application  
28 of an adapted Spanish version of the RBI showed that the reliability of the instrument was  
29 either low or on the limits of acceptability (Mateos et al., 2011), which means that the two  
30 factors cannot be reliably considered in subsequent analyses, or at least that it will be difficult  
31 to draw firm conclusions from the results obtained. Third, 25-30% of the items that make up  
32 the two reported versions of the RBI (Schraw, 2000; Schraw & Bruning, 1996) did not, in the  
33 factor analysis, achieve a factor loading in excess of .30. Fourth, although the authors provide  
34 data about both the construct and criterion validity of the instrument, it is difficult to assess its  
35 content validity since they do not explain the specific steps they followed in constructing the  
36 scale or the precautions they took to avoid bias when developing it. Finally, all the studies  
37 that have used the RBI have applied it mainly to psychology and humanities undergraduates,  
38 thus limiting its validity to this small sector of the university population. This restriction may  
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3 have implications, since research examining the question of whether students from different  
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5 knowledge areas hold different epistemological beliefs has found both similarities and  
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7 differences in their beliefs. In their exhaustive review, Muis, Bendixen, and Haerle (2006)  
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9 attribute this result to the fact that knowledge areas may differ in certain epistemological  
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11 features, while sharing others. Specifically, based on specialized literature, knowledge areas  
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13 have been further classified as hard/soft (Biglan, 1973), well-/ill-structured (Frederiksen,  
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15 1984). Hard knowledge areas would be those for which an extended agreement among experts  
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17 on its epistemological and methodological paradigms exists, while soft knowledge areas  
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19 would be those with a broader debate and diversity of theories and methods employed.  
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21 Moreover, in well-structured knowledge areas problems would have more identifiable  
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23 solution strategies than problems in more ill-structured knowledge areas. The studies  
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25 reviewed report an increased presence of naive beliefs in hard/well-structured knowledge  
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27 areas (such as engineering) as compared with soft/ill-structured knowledge areas (e.g.  
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29 humanities), results that are supported by other recent research (Hakan & Munire, 2012).

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36 Consistent with previous studies about epistemological beliefs, the results of an  
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38 ongoing research project by our team that explores reading beliefs using the RBI  
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40 (Authors Mateos, Castells, Cuevas, Martín & Solé, in preparation) likewise indicate that in  
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42 addition to knowledge domain, other variables such as gender or educational level also  
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44 influence beliefs. However, in the case of gender this influence is not always conclusive,  
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46 while in the case of educational level it is often nuanced. With regard to gender, while some  
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48 studies have found that women tend to hold more sophisticated beliefs than do men (Baxter  
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50 Magolda, 1992; Cano, 2005; Mason, Boldrin, & Zurlo, 2006; Schommer, 1993), others have  
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52 observed no significant differences (Buehl, Alexander, & Murphy. 2002; Hakan & Münire,  
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54 2012; Nayebi & Tahriri, 2014). In terms of educational level, differences have been observed  
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56 in the degree of sophistication of beliefs between undergraduate and secondary school  
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3 students (Schommer, 1998) and between graduates and undergraduates (Jehng, Johnson &  
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5 Anderson, 1993), in favour of those who were at the higher level. In the case of  
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7 undergraduates, some studies report differences between course years (King & Magun-  
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9 Jackson, 2008) while others do not (Jehng, Johnson & Anderson, 1993; Hakan & Münire,  
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11 2012; Ulucinar, Akar, Demir, & Demirhan, 2012). These results suggest that research on  
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13 beliefs should include participants from both genders and from across different knowledge  
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15 areas and educational levels.  
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20 The above points justify the development of a new instrument for investigating the  
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22 reading beliefs of university students. This instrument would not only need to be valid and  
23  
24 reliable but must also be derived from a complex view of reading that emphasizes its  
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26 epistemic dimension. Obviously, it should also overcome some of the aforementioned  
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28 limitations of the RBI. Given the limited amount of previous research on reading beliefs and  
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30 the relative novelty of our proposal, we regard our study as being of an exploratory nature. As  
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32 previous research has shown that gender, educational level and knowledge area all have an  
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34 influence on beliefs, a further aim of the study is to explore whether these variables produce  
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36 some variation in reading beliefs. In order to achieve our objectives the study was organized  
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38 into two distinct phases: the first involved the construction of a questionnaire, while the  
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40 purpose of the second was to examine its internal structure and to obtain the final version.  
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### 48 **Phase 1: Construction of the *Cuestionario de Creencias sobre la Lectura* (CCL)**

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51 The process of constructing the *Cuestionario de Creencias sobre la Lectura* (Reading  
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53 Beliefs Questionnaire, hereinafter the CCL, in accordance with its original name in Spanish)  
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55 involved several stages: an item development stage based on generating a first bank of items,  
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57 a content validation stage aimed at assessing the content and format of the questionnaire, and  
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59 a pilot study.  
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### Item development stage

In accordance with the two perspectives on reading described in the previous section, and after a thorough review of the specialist literature, we conceptualized the construct of interest in terms of two kinds of reading beliefs: a *reproductive* viewpoint, akin to a simple view of reading, and an *epistemic* viewpoint, consistent with a complex view.

Three different sources were then used to develop an initial item bank. First, a number of items were adapted from existing instruments for measuring reading beliefs (Schraw, 2000; Schraw & Bruning, 1996), as well as from other instruments designed to measure writing beliefs (Lavelle, 1993; Villalón & Mateos, 2009; White & Bruning, 2005) or epistemological beliefs (Schommer, 1998; Schraw, Bendixen, & Dunkle, 2002) but which include items referring to reading or knowledge acquisition through reading. Second, new items were created based on the answers that a group of 32 Spanish undergraduates (21 female, 11 male) gave to a questionnaire comprising 12 open-ended questions (Appendix 1). This questionnaire was created ad hoc with the aim of identifying certain beliefs and behaviour patterns of undergraduate students concerning reading. The students who completed this questionnaire came from the University of Barcelona or the Technical University of Catalonia (Spain) and were in the first or final year of a degree in either psychology or engineering (average age: 22.06,  $SD = 3.31$ ). Their answers were subjected to content analysis using a category system developed ad hoc for each of the 12 questions following a deductive-inductive method. Finally, new items were generated based on a comprehensive review of the literature on reading and reading beliefs, specifically as regards those aspects of reading not taken into account in previous studies, or which were partially or not at all covered by the items that we had adapted or created in the previous two steps.

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3 These three steps yielded an initial item bank of 74 items. It was decided that they  
4 would be rated using a 6-point Likert scale anchored by *totally disagree* (1) and *totally agree*  
5 (6) so as to avoid the common tendency to select the middle value. The questionnaire design  
6 was then planned, and both the item bank and the format were included in the next stage.  
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### 13 14 15 **Content validation stage** 16

17 Given the recommendation that at least five judges should be selected for content  
18 validation (McKenzie, Wood, Kotecki, Clark, & Brey, 1999), seven researchers from  
19 universities and research institutions in Spain and other countries were asked to serve as a  
20 content validation panel. Three of the researchers were experts in the construct we are  
21 exploring (reading beliefs), two of them were experts in reading and the other two were  
22 experts in beliefs. All seven experts agreed to participate and were provided with a content  
23 validation form which included a description of the construct of reading beliefs, a list of the  
24 74 items, and two possible response formats for the questionnaire. The judges were asked to  
25 independently assess each of the 74 items according to four criteria: a) the item is clear and  
26 understandable in its wording, b) the item is relevant to the measurement of reading beliefs, c)  
27 the item is tendentious and could generate stereotyped answers, and d) the reading beliefs  
28 scale (i.e., reproductive or epistemic) which they believed the item measured. In addition,  
29 judges were free to add comments in order to clarify their ratings. A separate instrument was  
30 created to assess the format of the CCL in terms of the instructions, the response scale, and its  
31 appearance.  
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52 Inter-judge agreement was analysed using a derivation of a previously described  
53 Content Validity Index (CVI; Wynd, Schmidt, & Schaefer, 2003). The CVI provides a  
54 quantifiable method for evaluating the judgments of content experts, using proportion  
55 agreement for each item on each evaluation criterion, for example, the proportion of experts  
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3 who were in agreement about an item's relevance to the domain of content (criteria b) or who  
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5 matched the item to its intended scale (criteria d). Only items with a CVI > .70 were  
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7 preserved. For the purposes of the present study, the qualitative information provided by the  
8  
9 judges was also taken into account in order to modify the wording of some items, or to  
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11 maintain items that the judges considered were worth testing in the pilot study even though  
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13 their corresponding CVI was slightly below .70. A total of 63 items were retained as a result  
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15 of this content validation process.  
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### 22 **Pilot study**

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24 A pilot study was then conducted using the 63-item version of the questionnaire. The  
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26 aim was to determine whether the items were easily understandable by the target population,  
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28 and also to carry out preliminary psychometric analyses in order to obtain the version of the  
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30 questionnaire that would be used in the second phase of this study.  
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34 The questionnaire was administered to a sample of 152 undergraduates (111 female,  
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36 41 male) who were enrolled in the first or final year of a degree in either language and  
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38 literature or psychology at the University of Barcelona (average age: 22.71,  $SD = 7.25$ )  
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40 (Table 1).  
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46 **Insert Table 1**

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50 The internal consistency of the students' answers to this initial version of the CCL was  
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52 analysed by calculating Cronbach's alpha coefficients (Cronbach, 1960). The results showed  
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54 that reliability was more than acceptable for the instrument as a whole ( $\alpha=.84$ ), as well as for  
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56 the two hypothetical scales that were established theoretically and which refer to reproductive  
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58 and epistemic beliefs about reading (reproductive scale:  $\alpha=.81$ ; epistemic scale:  $\alpha=.82$ ). Item-  
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3 test Pearson correlation analysis was nevertheless carried out to test how well each item fitted  
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5 into the instrument and the subscale for which it was created. For item discrimination, the  
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7 correlation between the item and the total test score provides an approximation to the  
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9 correlation between the item and the latent construct measured by the instrument (Dawber,  
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11 Rogers, & Carbonaro, 2009; Urry, 1974). Items for which the correlation coefficient was  
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13 below .30 were eliminated (Alberta Education, 1999), leading to a reduction of the pool to 49  
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15 items.  
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## 22 **Phase 2: Exploratory and Confirmatory Analysis of the Internal Structure of the CCL**

### 26 **Method**

#### 31 **Participants**

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34 A sample of 558 undergraduates (358 female, 200 male) took part in the study. They  
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36 were enrolled in the first or final year of a degree programme in psychology, language and  
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38 literature, or engineering at either the University of Barcelona or the Technical University of  
39  
40 Catalonia (Spain). All the students (average age: 21.14,  $SD = 4.61$ ) took part in the study  
41  
42 voluntarily, and they received no financial recompense or extra course credits for doing so  
43  
44 (Table 2).  
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Insert Table 2

#### 55 **Materials**

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58 The instrument used in this phase of the study was the 49-item version of the CCL that  
59  
60 resulted from the pilot study. This questionnaire was designed to explore the reading beliefs

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3 of undergraduates, who were asked to rate each item statement on a 6-point Likert scale, from  
4  
5 *totally disagree* (1) to *totally agree* (6). Respondents were instructed to answer taking into  
6  
7 account the reading situations they most typically encountered in both academic and daily life.  
8  
9  
10 Thirty-nine of the questionnaire items were presented indirectly (e.g., “Good readers  
11  
12 remember almost everything they read word for word”), while the remaining 10 items  
13  
14 referred to the students’ own activity as readers (e.g., “When I read, I usually think about  
15  
16 what I want to achieve from my reading”).  
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## 22 **Procedure**

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24 Data were collected in group sessions lasting 15-20 minutes. With the consent of the  
25  
26 teaching staff who voluntarily agreed to collaborate with the study, the first author  
27  
28 administered the CCL to the students in their usual classroom and in the presence of their  
29  
30 teacher. Once the students had finished the task, the researcher collected the completed  
31  
32 questionnaires. When designing the study and its implementation (data collection and  
33  
34 analysis), steps were taken to ensure that the participants’ wellbeing was not undermined in  
35  
36 any way, and also that their right to privacy was respected. The first author was responsible  
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38 for ensuring that all aspects of the research process were conducted in accordance with the  
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40 ethical principles required by scientific investigation.  
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## 51 **Results**

### 52 **Exploratory Factor Analysis and Evidence of Validity Based on Internal Structure**

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54 The CCL was analysed using a principal factor analysis with oblimin rotation and  
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56 Kaiser normalization. All 49 items were examined in this analysis in order to identify the  
57  
58 factors that emerged from them. The Kaiser-Meyer-Olkin (KMO) measure of sampling  
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3 adequacy was .78, which is well above the acceptable limit of .5 (Field, 2013), and Bartlett's  
4  
5 test of sphericity (BTS) was significant,  $\chi^2 = 5273.30, p < .0001$ . These results suggest that  
6  
7 the sample size was sufficient in relation to the number of items, and also that the correlation  
8  
9 matrix was not an identity matrix; therefore, the matrix was deemed factorable.  
10  
11

12  
13 The analysis yielded 15 factors with an eigenvalue greater than one, which together  
14  
15 explained 57.54% of the total sample variation. The scree plot provides a fairly reliable  
16  
17 criterion for factor selection when a sample includes more than 200 participants (Stevens,  
18  
19 2009). For this analysis, the scree plot indicated that both two and six eigenvectors could be  
20  
21 extracted (Bryant & Yarnold, 1995). First, we selected the two factors for closer inspection in  
22  
23 order to determine whether they corresponded to our two hypothesized factors: epistemic and  
24  
25 reproductive beliefs about reading. At this point, 18 items from the original 49-item CCL  
26  
27 were eliminated on the basis of two main criteria (Costello & Osborne, 2005): a) item  
28  
29 loadings and cross-loadings, and b) the conceptual consistency of the items with the factor  
30  
31 they loaded on in terms of factor interpretability. Items with a factor loading below .30 were  
32  
33 eliminated, except in two cases (see Table 3; loadings of .24 and .25, respectively) where the  
34  
35 items were preserved because they were conceptually consistent with the other items that  
36  
37 clustered on the same factor. It is important to remember that the significance of a factor  
38  
39 loading depends on the sample size (Stevens, 2009). Stevens recommends that for a sample of  
40  
41 400 the loading should be greater than .25, while for 600 participants it should be greater  
42  
43 than .21. Therefore, maintaining these two items is perfectly acceptable given that our sample  
44  
45 comprised 558 students. Items with cross-loadings were excluded, except in three cases (see  
46  
47 Table 3) that presented substantially higher loadings on one factor (above .43) and lower  
48  
49 loadings on the other (equal or close to .20). Finally, two items that were not conceptually  
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51 consistent with the factor on which they loaded were also eliminated.  
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3 The two factors from the forced two-factor solution were represented by 31 statements  
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5 (KMO = .76; BTS = 2931.49,  $p < .0001$ ) (Table 3). The two factors identified were  
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7 uncorrelated ( $r = .021$ ,  $p = .64$ ), indicating that an individual's degree of agreement with  
8  
9 reproductive reading belief statements did not relate to the extent of his or her agreement with  
10  
11 epistemic reading belief statements. The two factors accounted for 23.34% of the sample  
12  
13 variation: *epistemic scale*: 19 items, eigenvalue = 3.90, explained variance = 12.59%;  
14  
15 *reproductive scale*: 12 items, eigenvalue = 3.33, explained variance = 10.75%. The internal  
16  
17 consistency for the two factors, using Cronbach's alpha, was .77 and .74, respectively.  
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25 Insert Table 3  
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29 Given that reading beliefs is a complex construct, and taking as our starting point the  
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31 31 items from the forced two-factor solution, we further explored whether there might be  
32  
33 more dimensions to this measure, and if so, whether they explained a larger proportion of the  
34  
35 variance. Specifically, a new exploratory factor analysis was conducted to examine a forced  
36  
37 six-factor solution, as had been indicated by the scree plot (KMO = .76; BTS = 2931.49,  $p$   
38  
39  $< .0001$ ). The six factors accounted for 43.53% of the sample variation.  
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43 The first factor corresponded to the epistemic scale and was labelled *mediating role of*  
44  
45 *writing while reading*, since it reflects the belief that using some kind of writing (e.g., taking  
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47 notes, producing summaries, outlines, or diagrams) to organize and elaborate on the  
48  
49 information from texts helps comprehension (4 items, eigenvalue = 3.90, explained variance =  
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51 12.59%). The second factor corresponded to the reproductive scale and was labelled *the text*  
52  
53 *is the most important aspect* (7 items, eigenvalue = 3.33, explained variance = 10.75%), since  
54  
55 it refers to the idea that a text has the meaning that the author intended it to have, and hence it  
56  
57 can be understood by everyone who is a "good reader" independently of the contextual or  
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3 source features. The third factor corresponded to the epistemic scale and was labelled *reading*  
4 *as a constructive process* (5 items, eigenvalue = 1.75, explained variance = 5.63%) as it  
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6 reflects the idea that every reading situation is different in terms of goals, context, sources,  
7  
8 etc., and therefore a strategic approach is required in order to attain a good understanding.  
9  
10 The fourth factor corresponded to the epistemic scale and was labelled *setting goals and*  
11 *planning the reading process* (5 items, eigenvalue = 1.59, explained variance = 5.14%) as it  
12  
13 appears to reflect the importance of having specific reading goals and planning the reading  
14  
15 process in order to reach understanding of the text. The fifth factor, corresponding to the  
16  
17 reproductive scale and labelled *reading as a mechanical process* (5 items, eigenvalue = 1.46,  
18  
19 explained variance = 4.72%), reflects the idea that reading is a mechanical, superficial process  
20  
21 in which thinking about the content and elaborating on the information while reading does not  
22  
23 help to understand the source material better. Finally, the sixth factor corresponded to the  
24  
25 epistemic scale and was labelled *reader's active involvement in reading* (5 items, eigenvalue  
26  
27 = 1.46, explained variance = 4.70%), it being related to the need to engage actively with the  
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29 reading process, contributing one's personal knowledge and going over and discussing  
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31 relevant information from the sources.  
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#### 43 Insert Table 4

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48 Pearson correlations indicated that the two factors corresponding to the reproductive  
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50 scale were correlated positively with one another, as were the four factors that corresponded  
51  
52 to the epistemic scale (Table 5). A significant negative correlation was found between *the*  
53  
54 *text is the most important aspect*, a factor that corresponded to the reproductive scale, and  
55  
56 *reading as a constructive process*, a factor corresponding to the epistemic scale ( $r = -.09$ ,  $p$   
57  
58 = .03). Aside from the negative sign, which is appropriate in this case, Cohen's interpretation  
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3 guideline (1988) indicates that the size of the Pearson correlation between these two factors is  
4  
5 below the lower limit for what would be considered a small correlation ( $r \leq .10$ ), and it can  
6  
7 therefore be concluded that no relevant relationship exists between the abovementioned two  
8  
9 factors. Again, these findings indicate independence between reproductive and epistemic  
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11 beliefs.  
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#### 17 18 Insert Table 5 19 20 21

22 The internal consistencies for each factor, based on Cronbach's alpha, were as follows:  
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24 *mediating role of writing while reading = .70, the text is the most important aspect = .72,*  
25  
26 *reading as a constructive process = .57, setting goals and planning the reading process = .57,*  
27  
28 *reading as a mechanical process = .60, reader's active involvement while reading = .65.*  
29  
30 Thus, good and acceptable internal consistency results were obtained for both the scales and  
31  
32 the dimensions of the CCL. Indeed, the reliability is more than acceptable given that we are  
33  
34 dealing here with a psychological construct (Kline, 1999) and a newly created instrument,  
35  
36 where the limit for reliability coefficients is .50 (Hair, Anderson, Tatham, & Black, 1999;  
37  
38 Nunnally, 1978). Factor loadings for individual variables considering both the two-factor and  
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40 six-factor structures are shown in Tables 3 and 4, respectively.  
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#### 48 49 **Confirmatory Factor Analysis**

50 To examine how well the six-factor model suggested by the exploratory factor analysis  
51  
52 [previously explained in this paper](#) represented students' beliefs about reading, we also  
53  
54 conducted a confirmatory factor analysis using Mplus 7.11 (Muthén & Muthén, 2013; Bryant  
55  
56 & Yarnold, 1995). Support was found [for the three-dimensional model of six factors](#) in that  
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60  $\chi^2(419, n = 558) = 828.44, p < .001$ . Although a non-significant  $\chi^2$  would ideally be obtained,

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3 it should be noted both that statistical significance is almost always observed in models with  
4 participants of 400 or more (Kenny, 2012), and also that a good-fitting model may be  
5 indicated when the ratio of the  $\chi^2$  to the degrees of freedom (in this case, 1.98) is less than two  
6 (Tabachnick & Fidell, 2007). Moreover, the standardized root mean square residual (RMSR),  
7 which should be less than .10, was .058, and the root mean square error of approximation  
8 (RMSEA), which should be less than .05, was .042 (90% CI = .038 - .046). Taken together,  
9 these fit indices indicate that the hypothesized model fits the data well (Hu & Bentler, 1999).

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20 As a complement to the above findings, and although a detailed analysis and  
21 interpretation of the differences in reading beliefs across gender, educational levels and  
22 knowledge areas is beyond the scope of the present study, an overview of the results obtained  
23 will now be offered as one measure of the CCL's goodness. Several univariate and  
24 multivariate analyses of variance (ANOVAs and MANOVAs) were conducted with the  
25 aforementioned three factors as the independent variables and the two scales or the six  
26 dimensions of the CCL as the dependent variables. Regarding gender, and for the two- and  
27 six-factor structures of the CCL, female students generally ascribed more value to epistemic  
28 reading beliefs than did male students, whereas there were no significant gender differences in  
29 regard to reproductive reading beliefs. In terms of educational level, and again for the two-  
30 and six-factor solution of the CCL, students in the first year of their degree were more likely  
31 to hold a reproductive point of viewpoint on reading than were final-year students, whereas  
32 only non-significant differences were found for epistemic beliefs. Finally, with respect to  
33 knowledge domain and both the two- and six-factor structure of the CCL, the beliefs of  
34 psychology students appeared to be the most epistemic and least reproductive in comparison  
35 with the beliefs of language and literature and engineering students, while engineers seemed  
36 to hold the least epistemic and most reproductive beliefs of the three groups ([Authors Lordán](#)  
37 & Solé, in preparation).

## Discussion

The purpose of this study was to create a new questionnaire for identifying undergraduates' beliefs about reading. Exploratory and confirmatory factor analyses produced two main findings. The first was that the CCL yielded two psychometrically reliable factors, which were captured by 31 items in its final version and were consistent with those proposed previously on the basis of theory: one factor corresponded to epistemic beliefs about reading, while the other reflected reproductive beliefs. In addition, however, the results illustrate that reading beliefs is a complex construct, since the analysis also revealed a six-factor structure based on the same 31 items that was conceptually and methodologically more complex and richer than the initially hypothesized two-factor solution. These six dimensions, which are constituent aspects of our perspective on reading and are supported by the literature on this topic, concerned the role of the reader, the role of the text, the nature of the reading process from both a simple and complex viewpoint, the importance of establishing and considering a reading objective and of planning the process on this basis, and the role of writing as a support for comprehension during the reading process. Together, these results provide empirical support for the notion that there are different views on reading, - more simpler, more complex (e.g., Stahl & Hiebert, 2005; Norris & Phillips, 2009). The second main finding was that the two kinds of reading beliefs (epistemic and reproductive) were uncorrelated, which is consistent with the findings of previous research in the field (Schraw & Bruning, 1996; 2000). Thus, an individual's relative agreement with the premises of the epistemic dimensions did not determine whether he or she agreed with the assumptions of the reproductive dimensions.

The process of constructing and validating this questionnaire involved a combination of quantitative and qualitative methods, and the rationale for the retention and deletion of

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3 items was clearly linked both theoretically and empirically. Overall, the instrument has good  
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5 initial psychometric properties. The content validation review served as a way of selecting  
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7 those items for which a high degree of agreement was achieved among the seven experts,  
8  
9 these being the items that were representative of reading beliefs. The two- and six-factor  
10  
11 structures both yielded good internal consistency results. It should be noted that two  
12  
13 dimensions in the six-factor solution had a reliability coefficient slightly below .60 (.57 in  
14  
15 both cases). However, this can be considered acceptable for a new instrument that explores a  
16  
17 construct about which little previous research has been conducted and for which the  
18  
19 remaining factors achieved good reliability indices. The moderate reliability of these two  
20  
21 factors could be due to cross-loading on one of the factors and to the presence of the item with  
22  
23 the lowest factor loading (.30) for the instrument as a whole, although, importantly, the  
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25 loading on the other factor was acceptable. Despite these findings, both items were retained  
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27 in the questionnaire due to their conceptual relevance and to the value of their loading on the  
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29 principal factor. Consequently, the resulting structure should be viewed as rationally  
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31 constructed with the aid of empirical evidence.  
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39 Beyond the limitations which are inherent to any exploratory study, our work  
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41 contributes to the identification of variables that have an influence on comprehension, and  
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43 offers a new framework for research and educational intervention in this field. Importantly, it  
44  
45 also extends the scope of previous research: these studies have explored reading beliefs in  
46  
47 samples of junior undergraduates drawn mainly from psychology and the humanities, and the  
48  
49 validation of instruments therefore relies on data derived from these samples. The present  
50  
51 study adds new knowledge to the field of reading beliefs by considering both junior and  
52  
53 senior undergraduates in different areas of knowledge. The study also reports interesting  
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55 results regarding the influence that these two factors, as well as the gender of the students, can  
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57 have on reading beliefs; specifically, females, students in the final year of their degree and  
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3 students in soft knowledge areas tend to be more epistemic and/or less reproductive than are  
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5 males, first-year students and those studying in hard knowledge areas.  
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8           The questionnaire developed here to explore the reading beliefs of undergraduates can  
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10 contribute, alongside other variables, to a better understanding of how they approach the  
11  
12 kinds of texts they will constantly encounter during their education and professional  
13  
14 development. Indeed, a good instrument of this kind can help us to understand and explain  
15  
16 what students think about reading, how they describe their use of it, and, consequently, how  
17  
18 they tackle situations involving reading and comprehension. In addition to the usefulness of  
19  
20 this questionnaire for generating knowledge about its target construct, we believe that the  
21  
22 present study makes a further two contributions to the field of educational psychology,  
23  
24 specifically as regards the role of reading in literacy: a) it provides an instrument for research  
25  
26 in this field that is coherent with and respectful of a complex, constructive view of reading;  
27  
28 and b) this same instrument offers teaching staff a way of exploring and identifying their  
29  
30 students' reading beliefs and, in turn, of raising students' own awareness of these beliefs. This  
31  
32 knowledge could then be used to design reading and learning tasks that would challenge the  
33  
34 simple view of reading. The CCL may also prove useful for training purposes, since it can  
35  
36 help future and current teachers to identify their own conceptions of reading, highlighting any  
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38 aspects that need to be addressed. As it is based on a wide-ranging yet specific and explicit  
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40 theoretical background of reading and reading comprehension, the questionnaire may be  
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42 capable of identifying readers with overly simplistic reading beliefs, thereby helping to map  
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44 out avenues for effective reading intervention.  
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52           Questionnaires are a widely used method for collecting data about psychological  
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54 constructs such as beliefs, including those that concern reading. Although as instruments they  
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56 have certain limitations, they nonetheless provide an indirect, relatively straightforward and  
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58 quick way of exploring individual responses in relation to variables whose implicit nature  
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3 makes them difficult to access. In studies that have explored beliefs it is recommended that  
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5 instruments such as questionnaires be used in combination with problem-solving tasks that  
6  
7 can provide information about actual behaviour in relation to the construct under study,  
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9 information that can then be compared with the declarative information so as to check the  
10  
11 latter's validity (Pérez Echevarría et al., 2006). Studies such as this often ask students to  
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13 produce a piece of writing based on their reading of source material, or to answer a series of  
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15 questions about the content of a text, the aim being to explore the influence of reading beliefs  
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17 on the level of comprehension that is achieved.  
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22 With regard to the above, it is acknowledged that while the present study provides  
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24 validity evidence in relation to the dimensionality of the CCL and the variation in reading  
25  
26 beliefs across gender, educational levels and knowledge domains, further work is required to  
27  
28 gather more evidence about its criterion validity. Specifically, it is necessary to explore the  
29  
30 relationship between the reading beliefs addressed by the CCL and other variables that,  
31  
32 according to the literature and research in this area, are likely correlates, reading  
33  
34 comprehension being a case in point. We are already working on this endeavour, an  
35  
36 important task when one considers that reproductive and epistemic reading beliefs may have a  
37  
38 notable impact on reading comprehension tasks of different levels of complexity. .  
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44 Additionally, and as a complementary measure of the suitability of the instrument, we have  
45  
46 recently begun a study aimed at producing an English version of the CCL, thereby making it  
47  
48 available to the academic and educational community in two languages. In the meantime, the  
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50 questionnaire is offered to the scientific and academic community as a tool for conducting  
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52 new research on reading beliefs and for considering the implications they have for teaching.  
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3 **Appendix 1: Sample items from the open-question format questionnaire**  
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8 1. What does reading mean to you?  
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10 4. Are there any reading situations in which you read with a clear purpose or objective?  
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12 Please give details, indicating the situation or situations, and the objective or objectives.  
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15 7. Which factor or factors most influence your ability to understand a text?  
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Table 1.

*Participants in the pilot study*

	Psychology	Language & Literature	Total per year
First year	64	10	74
Final year	58	20	78
Total per degree	122	30	152

Table 2.

*Participants in the final study*

	Psychology	Language & Literature	Engineering	Total per year
First year	100	113	89	302
Final year	100	86	70	256
Total per degree	200	199	159	558

Table 3.

*Factor loadings for the two-factor solution of the CCL*

Items	Components	
	I (Epist.)	II (Reprod.)
Q25. Taking notes while reading helps to organise the information in the text.	.65	
Q30. Discussing the content of a text with other people helps to understand it better.	.54	
Q48. When I reread a text, I often understand some of its ideas better.	.53	
Q43. Rereading helps me to better understand what I am thinking about the content of the text.	.52	
Q19. Taking notes on the important concepts in your own words is one of the best strategies for understanding a text.	.51	
Q11. To understand a book, one method that really works is to reorganise the information according to one's own outline.	.50	
Q33. Different types of text force one to learn new ways of reading.	.49	
Q45. When I am reading something that I want to learn, I usually take notes, make summaries, etc.	.48	
Q15. One of the aspects that most affects whether reading is easy is having sufficient knowledge of the topic.	.45	
Q36. What a person already knows about the topic of a text has a great influence on the extent to which he will be able to understand it.	.44	
Q49. The process of reading differs according to the text or the reading situation.	.43	-.20
Q29. One of the aspects that most affects whether reading is easy is knowing what one is looking for.	.39	
Q39. The main purpose of reading is to construct a personal meaning out of the information in texts.	.39	
Q38. A good reader thinks about how he will read the text (quickly, slowly, the entire text, some portions, etc.) before reading it.	.38	
Q14. How to read and understand texts should be taught at university.	.34	
Q26. While reading a text, making predictions about what will come next helps to understand it better.	.32	

Q21. When I read, I usually think about what I want to achieve from my reading.	.31	
Q31. What is understood from a text depends a lot on the reader.	.25	
Q7. A book can have different meanings depending on who the reader is.	.24	
Q46. People who know how to read rarely encounter texts that are difficult for them to understand.		.62
Q10. If a text is written correctly, everyone can understand it.		.61
Q24. Good readers remember almost everything they read word for word.		.60
Q42. Any text can be understood if one is highly focused.		.59
Q2. If one knows how to read, few texts will be difficult to understand.		.58
Q5. Using a dictionary can solve almost all comprehension problems that you encounter when reading a text.		.47
Q32. If you try to relate the new ideas in a book to what you already know about the topic, the only thing you will achieve is confusing yourself.	-.20	.46
Q16. Asking questions about what one is reading only serves as a distraction.	-.23	.45
Q28. Thinking about what one is reading is confusing, it is better to do so at the end of the text.		.44
Q37. One must wait until the end of the text to know whether one understands it.		.42
Q23. We learn to read when we are children, and this learning is sufficient to deal with different texts and reading situations throughout life.		.41
Q3. If I reread, I do so after I have read the entire text.		.37
<i>Eigenvalue</i>	3.90	3.33
<i>% explained variance</i>	12.59	10.75
<i>% accumulated explained variance</i>	12.59	23.34
<i><math>\alpha</math> coefficients</i>	.77	.74

Note 1: Factor loadings below .20 have been eliminated.

Note 2: This version of the CCL is a translation of the validated Spanish version, the results for which are presented in this paper. The English version shown here is in the process of being tested, and it should therefore be considered with due caution.

Table 4.

*Factor loadings for the six-factor solution of the CCL*

Items	Components					
	I	II	III	IV	V	VI
Q45	.75					
Q19	.73					
Q25	.71					
Q11	.58					
Q42		.70				
Q2		.65				
Q46		.64				
Q5		.62				
Q10		.55				
Q23		.43				
Q24		.42				
Q7			.78			
Q31			.70			
Q49			.54			
Q33			.50			
Q14			.30			
Q21				-.73		
Q29				-.60		-.34
Q38				-.59		
Q26				-.45		
Q39				-.41		
Q28					.74	
Q16					.72	
Q32					.54	
Q37					.49	
Q3					.35	
Q36						-.76
Q15						-.62
Q48						-.59
Q43						-.53
Q30						-.35
<i>Eigenvalue</i>	3.90	3.33	1.75	1.59	1.46	1.46
<i>% explained variance</i>	12.59	10.75	5.63	5.14	4.72	4.70
<i>% accumulated explained variance</i>	12.59	23.34	28.97	34.10	38.88	43.53
<i>α coefficients</i>	.70	.72	.57	.57	.60	.65



Table 5.

*Pearson correlations among the six dimensions of the CCL*

	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>	<i>V</i>	<i>VI</i>
I. Mediating role of writing while reading						
II. Text as the most important aspect	.02					
III. Reading as a constructive process	.26**	-.09*				
IV. Setting goals and planning the reading process	.28**	.08	.26**			
V. Reading as a mechanical process	-.01	.35**	-.03	.03		
VI. Reader's active involvement in reading	.37**	.037	.26**	.27**	-.05	

*Note:* \*  $p < .05$  (two-tailed), \*\*  $p < .01$  (two-tailed)

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