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This chapter introduces a model for re-creative cognition of cultural products. Based on this model first a questionnaire for re-creative reading of literary works is designed. Three groups completed the questionnaire: good (N=86), bad (N=79) and neutral (N=264) who recalled a good, a bad, and a random book they had recently read respectively. Reliability and various aspects of construct and internal validity are assessed, with the fit of a confirmatory factor model, through correlation with various personality traits and cognitive abilities, and through the relationship with the quality of the literary works and genre. In order to obtain an indication of the external validity of the proposed model through induction, a replication research was conducted with an analogous questionnaire for the evaluation of motion pictures, again with three conditions good (N=83), bad (N=83) and neutral (N=269). The subjects of these conditions respectively recalled a good, a bad, and a neutral film they had recently watched. Finally the latter questionnaire was used in an experiment with two audiences, one audience is submitted to a low-rated picture, Gus van Sant’s Even Cowgirls get the Blues (N=45), the other to a high-rated film, Giuseppe Tornatore’s Nuovo Cinema Paradiso (N=45). Most results support the re-creative cognition approach for the evaluation of cultural products.
INTRODUCTION

Esthetic judgments by art critics or literary scientists are usually stated in terms of 'good' or 'bad', and 'beautiful' versus 'awful', focusing on certain features of the artwork. However, a simple scientific demand, stated by Van het Reve (1979), is that the description of a thing only describes that one thing and no other. "In literary studies," Van het Reve (1979, pp.69-70) continues, "this prerequisite is not so obvious: How to describe a good book - without using the word 'good' - such that the description does not relate to a worthless book and how to describe a bad book - not using the word 'bad' or similar words - such that good books are not described by it?" Taking up Van het Reve's challenge, this paper envisions esthetics not in terms of good or bad, but in terms of different levels of cognitive activity during processing, that is, re-creative cognition.

Since J. P. Guilford's 1950 call to arms, to further study the concept of creativity (Guilford, 1950), the topic has gained increasing attention, and recently a number of substantive reviews of the topic have been published (c.f. Sternberg, 1988b, 1999; Simonton, 2000). For one of the many possible definitions of creativity Mayer (1999) discerns creativity as a property of products, people, or processes. The arts and humanities have traditionally studied creativity as an aspect of products, whereas psychology tends to focus on people, that is, individual differences (e.g. Simonton, 1997; 1999a; 1999b), or cognitive processes (Finke, Ward, & Smith, 1992; Runco & Sakamoto, 1999). But where there is an increased interest in the processes that play a part in the formation of art, literature, or novel ideas, there is still minor interest in the psychology of the observer, spectator, or reader. As opposed to the psychology of the creator, this study introduces the psychology of the re-creator, with the re-creative cognition model for the perception of cultural products, bridging notions from esthetics, reader and viewer research, and cognitive psychology.

Mayer's distinction of products, people and processes is easily maintained for the study of perception of creative products, studies that focus on 1) effects of stimulus aspects on perception, 2) individual or cultural spectator differences, and 3) studies on the cognitive processes of creative product perception. Although the
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studies on the first two categories are numerous, the endeavors that focus on cognitive processes still appear underexposed. If one searched the PsychInfo/PsychLit database on 29 May 2002, exploding and combining the database keywords perception and cognitive processes, one would have found 74 references to articles with the keyword art, 5 to literature, and 9 references to motion pictures. There are less than 90 publications in psychological journal articles, book chapters, and dissertations from more then 130 years of psychological research. The 14 articles on literature and motion pictures address a wide variety of topics, such as: the role literature can play in making people of different ethnic or cultural backgrounds understand one another better (Hakemulder, 2001), the influence of film variables on story comprehension (Roberts, & Macdonald, 2000), whether cinematic cuts serve a syntactic function for film viewers (Schwan, Hesse, & Garsoffky, 1998), the effects of cinematic style on perception (Seraji, 1991), the importance of editing rules for the narrative continuity of the film (d’ Ydewalle, & Vanderbeeken, 1990), whether the violation of cinematic rules weakens the story reconstruction and the evaluation of the characters (Kraft, 1987), the degree to which the concreteness of prose interacts with lateral preference of an audience under right hemispheric conditions (Dean, 1984), and the function of the cinema screen as prosthesis to the nervous system (Buck-Morss, 1994). Close examining these results shows that the majority of these articles belong to the category related to product features. Despite the use of the keyword cognitive processes, none of the articles appear to concentrate on these cognitive processes. A similar picture emerges from an examination of the 74 articles with the combined keywords art, perception and cognitive processes. However, worth mentioning is the neurological theory of esthetic experience by Ramachandran & Hirstein (1999) that presents eight laws of artistic experience that may consciously or unconsciously be manipulated by artists to optimally appeal to the visual areas of the brain.

In spite of the apparent lack of research on the role of cognitive processes in the perception of cultural products, substantial research has been performed on cognitive processes in such areas as intellectual ability (Sternberg, 1994; Sternberg, Grigorenko, Ferrari, & Clinkenbeard, 1999), problem solving (Duncker, 1945; De Groot, 1978; Mumford, Supinski, Baughman, Costanza, & Threlfall, 1997; Newell,
Shaw, & Simon, 1958, 1962), mental models (Johnson-Laird, & Byrne, 1993) and creativity (Gruber, Terrell, & Wertheimer, 1962; Finke et al., 1992; Sternberg, 1998).

Following Mayer's (1999) distinction of products, people, or processes, the numerous product-oriented theories are considered beyond the scope of this paper. However, the next section offers a review of a number of spectator-oriented theories within the specific framework of the perception of literature and narrative motion pictures. The section thereupon provides a summarized overview of cognitive processes from a general psychological point of view, since cognitive processes cannot be discussed in relation to the perception of creative products due to the aforementioned lack of research.

**People oriented theories on literature and narrative motion pictures**

One widespread view in both psychology and the arts is, that perceivers of art (readers, spectators, listeners) look for consistency in often-irreconcilable parts, whereas especially the modern artist may strive to deregulate that process. If the perceiver has difficulty in finding coherence, this will lead to frustration and consequently a lower appreciation of the artwork. If, on the other hand, coherence is found, this will lead to a resolved frustration and consequently a higher appreciation of the artwork (cf. Kreitler, & Kreitler, 1972).

Festinger's (1957) cognitive dissonance theory claims that effort induces liking, until one reaches an optimum. Several versions of this idea are found in the works of the Prague structuralist Mukarovsky (1964), the Russian formalist Sklovskij (1965), and more recently in Striedter (1989). According to Jauss (1982) the spectator's perception is dependent on the zeitgeist, and research should therefore focus on how readers from varying epochs responded to literature. He proposed a literary-historical research based on the reception of literary texts, and introduced the concept of expectation horizon to interpret and define the reader's frame of norms.

Roman Ingarden (1973) claims that the quality of literature can be found in the indeterminateness of the work as an object. The literary text merely provides the reader with a schematic map of reality, e.g., if a story mentions a table the reader may design the specifics of this table personally; note that variations of this notion are also found among psycholinguists Barwise and Perry (1983), Sperber and Wilson (1986),
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In literary studies Iser (1978) claims that readers of literature have to fill in the blanks (‘Leerstellen’) of a story, and cognitive linguist Fauconnier (1984) refers to these blanks as mental spaces. With their claims Iser and Fauconnier not only follow the idea of the indeterminateness of literary (Ingarden, 1973) and cinematographic works (Simons, 1995), but also the principle of ‘good continuation’ from Gestaltpsychology, and the principle of schematic anticipation from Otto Selz’s psychology of thought (‘Denkpsychologie’; 1913, 1922). The writer may even apply these blanks deliberately to hamper the good continuation of the story, for instance, to maintain the attention of the reader. Similarly, contemporary German film theorists Wuss (1993) and Ohler (1994) hypothesize the existence of Piagetian schemata in the perceptual process of a movie.

As an exponent of behaviorism Berlyne (1974) introduced a model, based on the idea that objects of art elicit a conflict that needs to be resolved. Hedonic value and esthetic appreciation are predicted by the degree of uncertainty about the solution of the conflict. A bigger conflict would bring more uncertainty with it and provide a potential basis for more resolved frustration and subsequently more hedonic value. The measure of esthetic pleasure, however, has a curvilinear relation to the degree of uncertainty that may be evoked by incongruence, complexity, novelty, or surprise, since a conflict that cannot be resolved, for instance because of its complexity, will induce no hedonic value. In a further specification of Berlyne’s idea’s, Cupchik (1995; 1996) argues that product features, such as suspense, novelty, inconsistency and uncertainty urge readers and spectators to ‘deeper processing,’ thereby enhancing esthetic pleasure.

“The close linkage between stimulus features and response elements is very behavioral and is therefore subject to mechanisms such as stimulus generalization and satiation which govern such processes” (Cupchik & Leonard, 1997, 88-89).

Yet, these authors are mainly concerned with the input and output of a black box, which leads to the questions what is inside the black box, which processes are
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evoked by stimuli like surprise, suspense or novelty, and how do these stimuli determine the outcome? Which of these ‘deeper processes’ are involved in the realization of judgments such as ‘beautiful piece’ and ‘bad production’, and finally, how can these processes be identified and operationalized? These questions are addressed in the remainder of this introduction.

Cognitive Processes

The cognitive tradition in modern psychology may provide us with some answers to the questions raised above. According to Otto Selz’s psychology of thought, dating back to the first half of the 20th century, every phase in a thought-process is explained from its preceding phenomena of consciousness (De Groot, 1978). In solving a riddle or understanding a text, the outcome (goal) is schematically anticipated, in mental representations. Between the eventual goal (the solution, outcome or interpretation) and the starting-point of the process, for example the propositions of the riddle, are one or more steps, as yet gaps that have to be filled in. Selz distinguishes four basic cognitive operations: comparison, combination, abstraction, and complex-completion. After every step in the thought process the outcome is again being anticipated, using a selection and/or combination of the basic operations. As a result of the constant reorientation at the ultimate outcome, the basic operations maintain a cyclic or even dynamic relation in the thought process.

Meili (1981) represents cognitive processes using four factors: analyzing information (Plastizität), restructuring information (Komplexität), synthesizing information (Globalisation) and performance (Flüssigkeit). Following a similar scheme, Sternberg’s (Sternberg, 1994; Sternberg et al., 1999) componential structure of intelligence distinguishes processes such as meta-, performance- and knowledge acquisition-components. The meta components plan, direct and monitor the problem solving process, guiding the knowledge acquisition components that direct the resolution of new problems, and the performance components that work out the plans. In addition, Sternberg distinguishes three main processes in the social cultural context: selective encoding, selective combination and selective comparison. It can be concluded that the cognitive tradition in psychology assumes a limited number of basic operations for the processing of literary texts or motion pictures.
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The following cognitive processes occur with at least two theorists: anticipation (Sternberg’s meta component), comparison, combination, and performance. Since combining ideas or information results in modified ideas or information, the combination process is identified as modification for the present study. Therefore, the following cognitive processes are considered the most prominent in evaluating a cultural product: anticipation, comparison, modification, and performance. The conceptual demarcation of these cognitive processes is explicated in the section below that introduces a model for the re-creative cognition of cultural products.

In their pursuit of creative cognition Finke et al. (1992) distinguish two types of cognitive processes in creative thought: generative processes, and exploratory processes. The generative processes allow the construction of mental representations, referred to as preinventive structures. The preinventive structures are given meaning by the exploratory processes and can again be further modified by generative processes. This cycle is repeated until the process results in a creative product, thought, or image in its final form (Finke, 1996). According to Ward, Smith, & Finke (1999) many mental processes may be involved that, at least in principle, are observable.

Summarizing, esthetic judgments of art may not be the mere result of a black box, but may comprise of specific cognitive processes that may be observed.

Domains of Consciousness

As cognitive psychologists tend to demarcate at least two domains of consciousness, the black box may be further disentangled. Especially in relation to social (Riggio, 1986; Riggio, Tucker & Coffaro, 1989; Riggio, Messamer & Throckmorton, 1990) and emotional (Bermond, 1998) intelligence, a cognitive and an affective domain are distinguished. This assumption of a cognitive-analytical and an affective-interpretative domain is supported by neuropsychological findings (Bermond, 1998). In attitude research, aimed at the evaluation of objects, three domains are distinguished: a cognitive, an affective and a behavioral domain (Kerlinger, 1984). The concerning areas of emotional and social intelligence, and the field of evaluating social objects appear crucial for the processing and evaluation of
cultural objects. Empathy and analysis of social-emotional stimuli form important aspects of the perception and appreciation of cultural products. Therefore a rational domain and an affective domain must be distinguished, and in case of esthetic judgments a virtual behavioral domain, like fantasy or the imaginary, may be more prominent than a real behavioral domain as for instance in attitude research. This distinction will be further explicated in the next section, where the proposed model is described.

A Model For Re-Creative Cognition

The model for the Re-Creative Cognition of cultural products (RCC) specifies the cognitive processes and consciousness domains that may form the foundation of the re-creative processing and appreciation of cultural products, seizing upon elements of the work of art. Examples of these elements are rhythm, tonality, melody, counterpoint (music), color, stroke of the brush, figure, clarity (architecture/ painting/ photo), plot, characters, place, theme, dialog (literature/ movies/ theatre). These elements form a more or less comprehensible unity, in which the artist, yes or no deliberately, may have left blanks. It is hypothesized that art observers recompose a work of art by filling in these blanks, using the aforementioned cognitive processes: anticipation, comparison, modification and performance.

The recomposition of a work of art starts with the perception of elements in a work of art, such as a fictional character, a musical theme, a metaphor, a brush stroke, a happy ending, as well as a more complex idea or theory of art, that may be prominent in the rational, affective and imaginary domains. The rational domain covers concepts such as logical inferencing, abstract thinking, literal and scientific description and mathematics, the affective domain refers to notions such as emotional states and affairs, intuition and morals, while the imaginary domain contains fantasy and other not empirically evident appearances. A fictional character, for instance, has different features, which are sampled while reading or watching, e.g. the brave knight has a plan (rational domain) to liberate the princess that he loves (affective domain) from the imprisonment of the three-headed dragon (imaginary domain).

The possible purpose or meaning of the perceived element to for example the
story line is discovered with the anticipation process. The anticipation process monitors and plans the recomposition of the story, the movie, or the work of art, directing the comparison and modification processes.

The comparison process searches for matching memory-concepts (Esquenazi, 1994) of previously stored information associated with the art-element, including more general knowledge, ideas, theories, thoughts and personal memories. Expectations about such concepts are not always 'correct' or 'satisfying', but may be deregulated by the work of art. Comparison of the perceived art-elements and the associated memory-concepts can be seen as an intersection between two sets of distinctive features. The ratio of the intersection and the distinctive sets may determine the coherence between the two. If the ideas and expectations about the art elements show a lot of overlap, a sense of coherence may be experienced, whereas little overlap may induce a feeling of incoherence.

In the latter case modification takes action. If enough shared features are found, there is no need to modify earlier assumptions on, for instance, the storyline. If too many distinctive features are found, disturbance urges modification of the feature sets of the art-elements and/or the memory-concept. Reading John Irving’s *Ciderhouse Rules* may bring one to reconsider one’s morals on abortion, and watching Francis Ford Coppola’s *The Godfather* may modify one’s ideas about the level of organization of modern crime. Modification, therefore, reduces disturbance and increases coherence. Both qualities are important for the appreciation of the literary work, and depend on the individual’s own level of tolerance. A film that offers nothing new evokes too little disturbance, as there is no puzzle to be solved (cf. Sternberg, 1988a).

Performance is a process that relates to the success of the cognitive recreation or recomposition of the work of art, for example when a book is too easy or too difficult, cognitive activation may be inhibited. In the first case, cognitive activation may be inhibited because of boredom, in the second case, because of incomprehensibility. Of course, individual abilities may affect the level of performance; so that, what presents a difficulty to one person may well be easy for another. For instance, James Joyce’s *Finnegan’s Wake* may be a joy for experienced readers whom may recognize abstractions from their reading experience, but
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incomprehensible for the novel reader. Or listeners to a modern piece of music may be offered too little support to sufficiently modify their ideas about music, not enabling them to fully appreciate the ‘foreign’ atonalities of the piece. Nevertheless, the paramount assumption of the RCC model is that using more processes in more domains positively affects appreciation. Thus, by measuring the activity of these processes, an ‘inter-subjective’ measure of the quality of the work of art may be obtained. Although these processes are described here as if they function consecutively, they may as well keep up a cyclic or dynamic relation, as the processes in Selz’s theory (1913, 1922).

After every step in the thought process that uses one or more basic operations, there is a renewed reorientation on the composition, a murder may be anticipated, because a jealous cousin seeking the inheritance shows up in the novel. Each reorientation may again demand one operation or a complex of operations for the next step, in the case of literature and narrative motion pictures the ongoing construction of a rational, affective and imaginary coherent story.

Development of the model in a questionnaire

The ‘Questionnaire Re-Creative Cognition of Literature’, or the QRCL was constructed with the the facet method (Borg, 1979; Canter, 1985; Guttman, 1954; Oosterveld, 1996). The aim of the method is to optimize content validity with a systematic and ideally, exhaustive specification of a concept. Concept analysis consists of the following three steps.

First, the essential aspects (or facets) of the concept are identified. Dekking and Raadsheer (1977) for example made a facet design for social anxiety in children. They defined social anxiety as an anxiety response in a situation requiring a certain achievement. In this case anxiety response and situation are the facets of social anxiety.

Second, the elements of the facets are determined so that they describe mutually exclusive categories within the facet. In the example of social anxiety the response facet was divided in a cognitive, an affective, a physical, and an avoidance response. The situation facet was divided in a social, an intellectual, and a physical achievement.
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Third, the final structure of the facet design is determined by a representation of the facets, their elements and the relationships between the facets in a so-called mapping sentence. The mapping sentence is the verbal expression of the facet design and produces the different specific descriptions of the concept. Every single specific description (structuple) results from the combination of one facet element with one of the elements of each of the other. According to the specified mapping sentence, a number of typical performance items (Ackerman, 1994; Ackerman & Heggestad, 1997; Rolfs & Ackerman, 1996) are written per structuple.

In the case of social anxiety there were 12 combinations of facet elements (structuples), defining unique representations of social anxiety. In the case of social anxiety in children, an example of such a structuple is a physical anxiety response in a situation requiring a social achievement, e.g., blushing when entering a room full of strangers.

To design the QRCL, a concept analysis was performed following Sloman’s (1978) indications, inventorying aspects related to beauty, cognition, perception and emotion. Four facets were defined: cognitive processes, domains of consciousness, art elements, and responses. Thereupon, anticipation, comparison, modification and performance were determined as the elements of the process facet, whereas three domains were established: the rational, the affective and the imaginary. Note that encoding and retrieval are not included in the design. In addition to the universal facets, the structures or art element facet is specific to each of the arts, in the present case covering specifics pertaining to literature. Consequently, this facet contains structural and stylistic principles that in Western society are considered elementary for the analysis of a novel. In the facet approach, the responses are often represented as an observed facet on which the theoretical facets are mapped.

Table 4.1 shows the 3x4 facet design (above) and the mapping sentence (below). The main structure of the facet design is formed by the four elements of the process facet that are crossed with the three elements of the domain facet, thus comprising the two facets of the RCC model that may be universal for both art forms and spectators. The resulting 12 structuples each reflect a specific mental state, in which the novel reader may be busy anticipating affective features (AA) or modifying imaginary features (IM).
By calculating the sum of rows and columns, seven scales for cognitive processing can be created. The horizontally aggregated scales (1-3) form the domain scales, whereas the vertically summed scales (4-7) form the process scales. Statistical analyses will be performed on the level of the main structure of the facet design, whereas the mapping sentence shows the representation of all four facets, their elements, and the relationship between the facets. The mapping sentence also contains the structure facet for literary elements and the response facet, so that items can directly be derived from it.

Table 4.1  Facet design for re-creative cognition of cultural products (RCC)

<table>
<thead>
<tr>
<th>Domain facet</th>
<th>Process facet</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Anticipation</td>
<td>Comparison</td>
</tr>
<tr>
<td>Rational</td>
<td>RA</td>
<td>RV</td>
</tr>
<tr>
<td>Affective</td>
<td>AA</td>
<td>AV</td>
</tr>
<tr>
<td>Imaginary</td>
<td>IA</td>
<td>IV</td>
</tr>
<tr>
<td></td>
<td>scale 4</td>
<td>scale 5</td>
</tr>
</tbody>
</table>

Mapping sentence

<table>
<thead>
<tr>
<th>Elements of cultural product</th>
<th>Processes</th>
<th>Domains</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plot</td>
<td>Anticipation</td>
<td>Rational</td>
</tr>
<tr>
<td>Melody</td>
<td>Comparison</td>
<td>Affective</td>
</tr>
<tr>
<td>Camera activates a(n)</td>
<td>Modification</td>
<td>Imaginary</td>
</tr>
<tr>
<td>Theme</td>
<td>Performance</td>
<td></td>
</tr>
<tr>
<td>Dialog</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rhythm</td>
<td></td>
<td></td>
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<tr>
<td>Color</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Style</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Etc.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Responses

"I disagree entirely" 1
"I disagree" 2
"I agree nor disagree" 3
"I agree" 4
"I agree entirely" 5

which leads the perceiver to respond:
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Hypotheses

Because the remainder of this paper consists of four studies, the research hypotheses are explicated per study. The first study addresses the construct validity of the QRCL, study 2 is committed to the internal validity of the questionnaire, study 3 assesses the external validity of the proposed model for other art forms, and study 4 evaluates its predictive validity on the appreciation of motion pictures. In Study 1 two hypotheses concerning the construct validity of the questionnaire are formulated:

Hypothesis 1a concerns the factorial structure of the data; with respect to this hypothesis, Mellenbergh, Kelderman, Stijlen and Zondag (1979) proposed a general factorial model for the structure of data resulting from a facet design. The assumption underpinning this model is that structuples that form a facet have something in common and can be described by a common factor. Consequently the factor model is not a simple structure solution, as each structuple loads on its constituent facet element factors. Thus, in the present case, the hypothesized factor model contains four process factors and three domain factors, and each structuple has two factor loadings: one on its process and one on its domain factor. With respect to the relationships among factors, it is assumed that the factors do not correlate between the facets, while they are allowed to correlate within the facets.

Hypothesis 1b concerns the possibility of reader characteristics as a possible confounding source of variance, and therefore hypothesizes no significant overlap with personality traits and cognitive abilities.

In Study 2 two hypotheses with respect to the internal validity, i.e., the relation between levels of cognitive activity and aspects of the literary works, are investigated.

Hypothesis 2a hypothesizes that more intense cognitive processing by the reader, will positively relate to the appreciation of a literary work, i.e., the scores on the QRCL scales should be higher for books rated as more appreciated than for books
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rated as less appreciated.

Hypothesis 2b hypothesizes that stronger expression of particular genres will occur more intensely in different domains of human thinking.

Study 3 aims at the external validity of the proposed model, i.e., whether the model can be generalized to other art forms. Therefore a questionnaire to measure the re-creative cognition of film viewers was designed analogous to the questionnaire for literature.

Hypothesis 3 expects to obtain similar results for the evaluation of the construct and internal validity of cinematographic works as for the evaluations of literary works.

Study 4, addresses the predictive validity of the film questionnaire. To find stronger support for the internal validity of the questionnaire, an experiment with two audiences is conducted, one audience is submitted to a low-rated picture, Gus van Sant's *Even Cowgirls get the Blues*, the other to a high-rated film, Giuseppe Tornatore’s *Nuovo Cinema Paradiso*.

Hypothesis 4 expects that subjects who are submitted to *Cinema Paradiso* will report more cognitive activity than viewers of *Cowgirls*.

**Study 1: Construct Validity of the QRCL**

The QRCL was administered to a large sample of psychology freshmen, together with various cognitive capacity tests and personality inventories, which were used for the construct validation of the questionnaire.

When the scales form reliable measures and if hypothesis 1a is supported, i.e., the theoretical 3x4 facet design fits the data, this will be considered support for the re-creative cognition model. Additional support is expected from hypothesis 1b, that
the capacity tests and personality inventories will show weak correlations with the QRCL scales, since the appreciation of a literary work should only marginally be affected by individual reader characteristics.

Method

Sample

The questionnaire was administered to 494 psychology freshmen. Subjects were randomly assigned to one of three conditions. Subjects filled in the questionnaire, in the first condition (N=86) while thinking of a good book they had read recently, while the second group (N=79) thought of a bad book they had read recently. In the third condition (N=264) subjects answered the questionnaire while thinking of a literary book, irrespective whether they considered it to be good or bad. Sixty-five subjects were not included in the analysis, because they reported they had never read a literary book, or because they failed to complete the questionnaire. The average age of the freshmen was 21 ranging between 17 and 58, 75% of them were women.

Questionnaire Re-Creative Cognition of Literature

Eight statements emanating from the mapping sentence (Table 4.1) were written per structuple, and completed as items with a five-point response scale. For each of the twelve structuples, four items were written indicative of the trait and four items were formulated contra-indicative, or negative of the trait; table 4.2 shows the contents of one item per structuple.

The distribution of the art elements over the structuples was as follows: Characters (# of items=15), Story-line (I=12), Surroundings/Place (I=11), Events/Facts (I=11), Theme (I=9), Main character (I=8), Style (I=7), Dialogs (I=6), Time (I=4), Suspense (I=4) and Miscellaneous (I=9; among others: Symbolism, Perspective, Motive). In writing the items, an effort was made to use as many different literary elements per structuple. Because there are more literary elements
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than items per structuple, not every literary element is represented in every structuple. Apart from nine structuples that contain one pair of items of the same literary element, all other art elements have single appearances per structuple.

Table 4.2 Items of the QRCL (i= indicative; c= contra-indicative)

| Rational Anticipation: | The suspense in the novel gave me ideas about how the story would develop (i). |
| Rational Comparison: | I compared the main theme of the book with my own thoughts about that subject (i). |
| Rational Modification: | The choice of words of the dialogues changed my idea of how one can put oneself across (i). |
| Rational Performance: | Rarely I could detect the motives of the characters (c). |
| Affective Anticipation: | The ambiance of the novel prevented my intuitive feelings about how this book might affect me (c). |
| Affective Comparison: | I rarely found my feelings in line with the emotions of the main character (c). |
| Affective Modification: | The style of the author hardly altered my feelings about the story (c). |
| Affective Performance: | Seldom, the events in the book let me get carried away (c). |
| Imaginary Anticipation: | The perspective, from which the story was told, made me daydream about what else might occur (i). |
| Imaginary Comparison: | I measured my fantasies about the story up to fantasies evoked by other novels (i). |
| Imaginary Modification: | Seldom, the images that the book evoked, effected my own imaginations (c). |
| Imaginary Performance: | The time that the story was set in, made my fantasies run wild (i). |

Additional measures

Six tests of intellectual abilities were applied, representing different intellectual skills from Guilford's structure of intellect model (Carroll, 1993). In addition, two personality inventories were administered, the Adjective Check List (Gough & Heilbrun, 1980), and the Dutch big five questionnaire 5 PFT (Elshout, 1976). Combined, these two personality inventories consisted of 42 scales, covering a wide variety of personality traits.

Statistical analysis

To establish the reliability of the scales, the extent to which scale scores are subject to error, Cronbach's α was used. Nunnally (1967) considers a value of 0.70 as the lower bound for sufficient reliability; scales with a lower reliability do not
measure a construct with enough precision.

To establish the construct validity of the scales, hypotheses of convergent and discriminant validities were tested. Two hypotheses were formulated with respect to: (H 1a) the factor-analytical structure that involves the convergent and discriminant properties of the scores within the instrument, and (H 1b) with respect to the relations with external measures.

To evaluate hypothesis 1a, a confirmatory factor analysis was performed on the covariance matrix of the structuples. As stated above, a seven-factor model was fitted to the data, with two factor loadings per structuple; one relating to a process factor, and one relating to a domain factor, and all other factor loadings restricted to zero. The correlations between the process and domain factors are also restricted to zero, but the elements are allowed to correlate within a facet. This is a fairly restrictive model with 33 degrees of freedom. Note that the psychometric specification of this model is equivalent to the way Marsh & Bailey (1991) have proposed to test multitrait-multimethod (MTMM) models.

The acceptability of the model was tested with a $\chi^2$ test. This test should result in a nonsignificant p-value, since significance indicates misfit. In large samples, however, the $\chi^2$ test may have too much power and models with trivial misfit may be rejected falsely. Fit measures are available that are less affected by sample size, such as the goodness of fit index (GFI) and the adjusted goodness of fit index (AGFI) and Steiger’s (1990) root mean square error of approximation (RMSEA). Both the GFI and AGFI should exceed 0.90 (Marsh, Balla, & McDonald, 1988). The RMSEA gives the error per degree of freedom of the fit of the population covariance matrix implied by the model to the population covariance matrix itself. Browne & Cudeck (1993) suggest that values below 0.05 indicate a close fit, whereas values up to 0.08 represent reasonable errors of approximation in the population. On a more detailed level, the factor loadings provide information on the strength of the relation between the structuples and the underlying factors. A low factor loading (<0.30) indicates that the structuple does not sufficiently capture the supposed concept, giving detailed information on where to improve the questionnaire if necessary.

Regarding hypothesis 1b, it could be argued that two main sources of variance, i.e., the books and the readers, are present in the QRCL scores, implicating
that the QRCL may be measuring reader characteristics as well. Since reader characteristics are regarded to be a confounding influence, the QRCL scores must be independent of the measures of these characteristics, i.e., personality and cognitive tests, in order to claim construct validity. More specifically, the QRCL scores must show discriminant validity with respect to these external measures. The influence of reader characteristics was examined by means of correlations between the scales of the QRCL and the cognitive and personality tests; correlations smaller than 0.30 were considered adequate for discriminant validity.

**Results**

Scale reliabilities establishing the homogeneity of the scales, are presented in Table 4.3, showing values well above the 0.70 boundary, and apart from the 0.80 for rational, all values are above 0.85.

<table>
<thead>
<tr>
<th>Table 4.3</th>
<th>Reliabilities (Cronbach’s α), means and standard deviations of the final QRCL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cronbach’s α</td>
<td>Mean</td>
</tr>
<tr>
<td>Rational</td>
<td>0.80</td>
</tr>
<tr>
<td>Affective</td>
<td>0.90</td>
</tr>
<tr>
<td>Imaginary</td>
<td>0.89</td>
</tr>
<tr>
<td>Anticipation</td>
<td>0.87</td>
</tr>
<tr>
<td>Comparison</td>
<td>0.90</td>
</tr>
<tr>
<td>Modification</td>
<td>0.85</td>
</tr>
<tr>
<td>Performance</td>
<td>0.90</td>
</tr>
</tbody>
</table>

Note: N=264

The covariance structure of the structuple scores was analyzed using confirmatory factor analysis. A model with seven factors was fitted to the covariance matrix of the subjects from the neutral condition (N=264). In formal terms, the chi-square test resulted in a rejection of this model ($\chi^2 = 68.00; df=33; p=0.00$), however, the ratio of the chi-square to the degrees of freedom is quite small and the alternative descriptive goodness of fit measures are acceptable; the $GFI = 0.96$ and $AGFI = 0.91$ both exceed the 0.90 boundary; the RMSEA (0.061), although above the 0.05 boundary for close fit, is below the 0.08 boundary for acceptable solutions; and the 90 percent confidence interval for RMSEA is between 0.039 and 0.083, with a $p$-value for test of
close fit ($RMSEA < 0.05$) = 0.19.

Next, the same seven-factor model was fitted to the data of all three conditions. Again, the chi-square test resulted formally in a rejection of the model ($\chi^2$ =92.81; $df$=33; $p$=0.00). However, the $GFI = 0.97$ and $AGFI = 0.92$ improved somewhat, whereas the somewhat poorer $RMSEA$ value (0.065) improved its 90 percent confidence interval (0.049; 0.081), with a p-value for test of close fit ($RMSEA < 0.05$) = 0.056. Factor loadings, factor correlations and unique variances for this analysis are shown in Table 4.4.

**Table 4.4  Model fit and parameter estimates of the facet design**

<table>
<thead>
<tr>
<th>FACTOR LOADINGS AND UNIQUE VARIANCES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rat.</td>
</tr>
<tr>
<td>RA</td>
</tr>
<tr>
<td>RC</td>
</tr>
<tr>
<td>RM</td>
</tr>
<tr>
<td>RP</td>
</tr>
<tr>
<td>AA</td>
</tr>
<tr>
<td>AC</td>
</tr>
<tr>
<td>AM</td>
</tr>
<tr>
<td>AP</td>
</tr>
<tr>
<td>IA</td>
</tr>
<tr>
<td>IC</td>
</tr>
<tr>
<td>IM</td>
</tr>
<tr>
<td>IP</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FACTOR CORRELATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rational</td>
</tr>
<tr>
<td>Affective</td>
</tr>
<tr>
<td>Imaginary</td>
</tr>
<tr>
<td>Anticipation</td>
</tr>
<tr>
<td>Comparison</td>
</tr>
<tr>
<td>Modification</td>
</tr>
<tr>
<td>Performance</td>
</tr>
</tbody>
</table>

Note: $N=429$, low factor loadings are in bold face, -- denotes a parameter restricted to 0.

The -0.56 correlation between modification and performance is hard to explain, on the data of the neutral condition only, this relation also showed a negative correlation (-0.21). The other process factor correlations are quite low (ranging from 0.01 to 0.55) showing that these are relatively independent. The domain factor
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loadings are high (ranging from 0.91 to 0.93), showing considerable overlap between these factors. We would like to point out that these are the correlations between latent variables, the correlations between the observed variables are considerably lower (ranging from 0.78 to 0.82). Nevertheless correlations this high could indicate a single domain factor, rather than four factors. To investigate this hypothesis, a five-factor model was fitted with a single domain factor and four process factors. However, the LISREL program (Jöreskog & Sörbom, 1996) did not find a statistically acceptable solution, i.e., a solution within the valid parameter space.

Table 4.5  Correlations of the QRCL-scales with capacity tests and personality inventories

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Verbal analogies</td>
<td>-0.04</td>
<td>-0.08</td>
<td>-0.06</td>
<td>-0.03</td>
<td>-0.10</td>
<td>-0.02</td>
<td>-0.05</td>
</tr>
<tr>
<td>Vocabulary</td>
<td>-0.08</td>
<td>-0.01</td>
<td>-0.02</td>
<td>-0.06</td>
<td>-0.03</td>
<td>0.05</td>
<td>-0.04</td>
</tr>
<tr>
<td>Logical reasoning</td>
<td>-0.00</td>
<td>0.01</td>
<td>0.07</td>
<td>0.03</td>
<td>-0.01</td>
<td>0.02</td>
<td>0.07</td>
</tr>
<tr>
<td>Numeric sequences</td>
<td>-0.01</td>
<td>0.03</td>
<td>0.01</td>
<td>-0.02</td>
<td>0.02</td>
<td>-0.01</td>
<td>0.05</td>
</tr>
<tr>
<td>Calculation speed</td>
<td>0.00</td>
<td>0.06</td>
<td>0.05</td>
<td>0.02</td>
<td>0.05</td>
<td>-0.02</td>
<td>0.09</td>
</tr>
<tr>
<td>Hidden figures</td>
<td>-0.14*</td>
<td>-0.14*</td>
<td>-0.10</td>
<td>-0.11</td>
<td>-0.15*</td>
<td>-0.14*</td>
<td>-0.03</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>ACL-affiliation</td>
<td>0.20*</td>
<td>0.15*</td>
<td>0.17*</td>
<td>0.19*</td>
<td>0.11</td>
<td>0.11</td>
<td>0.19*</td>
</tr>
<tr>
<td>ACL-intraception</td>
<td>0.21*</td>
<td>0.12</td>
<td>0.12*</td>
<td>0.19</td>
<td>0.03</td>
<td>0.06</td>
<td>0.25*</td>
</tr>
<tr>
<td>ACL-change</td>
<td>0.14*</td>
<td>0.16*</td>
<td>0.16*</td>
<td>0.13*</td>
<td>0.14*</td>
<td>0.11</td>
<td>0.17*</td>
</tr>
<tr>
<td>ACL-autonomy</td>
<td>-0.04</td>
<td>0.08</td>
<td>0.01</td>
<td>-0.03</td>
<td>0.09</td>
<td>0.04</td>
<td>-0.04</td>
</tr>
<tr>
<td>ACL-creative personality</td>
<td>0.09</td>
<td>0.15*</td>
<td>0.15*</td>
<td>0.05</td>
<td>0.14*</td>
<td>0.14*</td>
<td>0.13*</td>
</tr>
<tr>
<td>ACL-masculine</td>
<td>0.01</td>
<td>0.06</td>
<td>0.04</td>
<td>0.02</td>
<td>0.05</td>
<td>0.05</td>
<td>0.01</td>
</tr>
<tr>
<td>ACL-feminine</td>
<td>0.20*</td>
<td>0.17*</td>
<td>0.16*</td>
<td>0.22*</td>
<td>0.10</td>
<td>0.10</td>
<td>0.18*</td>
</tr>
<tr>
<td>5PFT-extraversion</td>
<td>0.02</td>
<td>0.01</td>
<td>0.08</td>
<td>0.08</td>
<td>-0.06</td>
<td>0.01</td>
<td>0.10</td>
</tr>
<tr>
<td>5PFT-friendliness</td>
<td>0.02</td>
<td>-0.00</td>
<td>0.07</td>
<td>0.08</td>
<td>-0.08</td>
<td>0.01</td>
<td>0.10</td>
</tr>
<tr>
<td>5PFT-consciousness</td>
<td>0.01</td>
<td>-0.01</td>
<td>0.06</td>
<td>0.08</td>
<td>-0.08</td>
<td>-0.00</td>
<td>0.10</td>
</tr>
<tr>
<td>5PFT-neuroticism</td>
<td>0.01</td>
<td>0.01</td>
<td>0.08</td>
<td>0.08</td>
<td>-0.06</td>
<td>0.03</td>
<td>0.10</td>
</tr>
<tr>
<td>5PFT-openness</td>
<td>0.04</td>
<td>0.03</td>
<td>0.10</td>
<td>0.09</td>
<td>-0.04</td>
<td>0.04</td>
<td>0.11</td>
</tr>
</tbody>
</table>

Notes: N=260; significant correlations (p<.05) are marked with a *; ACL=Adjective Check List; 5PFT=5 Personality Factors Test [5 Persoonlijkheids Factoren Test]

Table 4.5 shows the correlations between the QRCL scales on the one hand and six cognitive and 12 personality scales on the other hand. Not all the correlations between the ACL and the QRCL are presented in Table 4.5, but those correlations
showed similar weak correlations and were therefore acceptable from the point of view of discriminant validity (<0.30).

Conclusion

In general, the results show support for the construct validity of the QRCL, the reliability estimates are high and most aspects of convergent and discriminant validity are supported. Nevertheless, two less favorable aspects of the QRCL were uncovered by confirmatory factor analysis: the association between modification and performance is unexplainably low (-0.56), and the domain factor correlations are high. However, a single domain factor model could not be retrieved from the questionnaire responses, showing that the three domain factors, though highly correlated, are empirically discernible.

Of 378 correlations (7 QRCL scales * 54 cognitive and personality scales) none attained a value higher than 0.30, with the strongest association between intraception and performance (0.25). This result indicates that cognitive abilities and personality traits do not substantially affect the results. These findings provide support for the construct validity of the QRCL, as an instrument that measures the effect of books on readers, rather than characteristics of people.

STUDY 2: INTERNAL VALIDITY

Study 2 addresses two hypotheses with respect to the internal validity of the questionnaire and possible effects of gender and age on the QRCL scores are also investigated. The data from the three conditions of Study 1 is used for the analyses presented in this study.

Method

Appreciation of the literary work

Appreciation of the literary work was assessed with an appreciation scale and a school grade rating of the book. The appreciation scale consisted of eight judgmental items, referring to different aspects of the quality of the literary work.
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(e.g., 'I thought the characters were strikingly well described'). These items were rated on a five-point response scale, ranging from 1 (not at all applicable) to 5 (very applicable). The reliability of this scale was 0.76 according to Cronbach's \(\alpha\) (mean=30.42, \(sd=4.68\), range 8-40). The school grade was obtained by asking the readers to rate the quality of the book on a scale from 1 (low quality) to 10 (high). In addition, the genre of the recalled book and gender and age of the respondents were assessed.

**Statistical analysis**

With respect to hypothesis 2a two approaches are taken, (1) a pseudo experimental approach that compares the scale means between the good and the bad conditions, and (2) a correlational approach that focuses on the relations between the scales of the QRCL and the appreciation- and school grade scales. For the latter approach, correlations above 0.30 were considered sufficient support.

For the first approach, the data from the 'good' (N=86) and 'bad' (N=79) conditions was utilized. To establish an overall significance level, first a multivariate analysis of variance (MANOVA) was performed, with group membership as the independent variable and the scales of the QRCL as the dependent variables. The multivariate test includes differences between conditions on all the scale-means, as well as differences between all possible combinations of scales, so-called interaction effects. Next, univariate analyses of variance (ANOVA) were used to assess single scale-mean differences between conditions. On both the multivariate and the univariate tests significance indicates group differences. Moreover, effect sizes (ES) were calculated, expressing scale mean differences in terms of their standard deviation. Cohen (1977) considers ES = 0.20 a small, ES = 0.50 an average, and ES = 0.80 a large effect.

The second approach to hypothesis 2a, the investigation of hypothesis 2b and the explorative analyses draws on the data of the neutral condition (N=264).

Hypothesis 2b is specified for three genres: detective, psychological and science fiction novels will activate stronger expression in the rational, affective and imaginary domains, respectively. T-tests were performed on the means of the domain scales of the QRCL for these three genres.
Finally, possible gender and age effects on the scales of the QRCL were explored with univariate tests.

**Results**

Table 4.6 presents the results pertaining to the first approach to hypothesis 2a. The effects of the ‘good’ vs. ‘bad’ conditions are significant (p<0.00), both for the overall multivariate test as well as for each single scale. The effect sizes between ‘good’ and ‘bad’ conditions ranged high to very high, from 0.89 to 1.89.

<table>
<thead>
<tr>
<th>Scales</th>
<th>Bad book Mean</th>
<th>Bad book SD</th>
<th>Good book Mean</th>
<th>Good book SD</th>
<th>p</th>
<th>ES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rational</td>
<td>91.24</td>
<td>16.40</td>
<td>108.90</td>
<td>13.13</td>
<td>0.00</td>
<td>1.20</td>
</tr>
<tr>
<td>Affective</td>
<td>82.81</td>
<td>19.39</td>
<td>113.02</td>
<td>17.36</td>
<td>0.00</td>
<td>1.64</td>
</tr>
<tr>
<td>Imaginary</td>
<td>86.82</td>
<td>19.15</td>
<td>111.88</td>
<td>18.27</td>
<td>0.00</td>
<td>1.34</td>
</tr>
<tr>
<td>Anticipation</td>
<td>68.65</td>
<td>13.91</td>
<td>84.31</td>
<td>13.79</td>
<td>0.00</td>
<td>1.13</td>
</tr>
<tr>
<td>Comparison</td>
<td>60.77</td>
<td>15.27</td>
<td>75.20</td>
<td>17.17</td>
<td>0.00</td>
<td>0.89</td>
</tr>
<tr>
<td>Modification</td>
<td>60.33</td>
<td>13.62</td>
<td>76.29</td>
<td>13.26</td>
<td>0.00</td>
<td>1.19</td>
</tr>
<tr>
<td>Performance</td>
<td>71.13</td>
<td>15.94</td>
<td>98.00</td>
<td>12.42</td>
<td>0.00</td>
<td>1.89</td>
</tr>
</tbody>
</table>

\[N = 79 \quad 86\]

Note: multivariate test Hotellings $T_{6,158} = 1.06$, p = 0.00)

Table 4.7 presents the results pertaining to the second approach to hypothesis 2a., showing correlations between QRCL scales and appreciation score and school grade rating for the no-instruction condition only. Only the correlation between comparison and appreciation does not exceed the 0.30 mark.

<table>
<thead>
<tr>
<th>Process</th>
<th>App.</th>
<th>Sg</th>
<th>Domain</th>
<th>App.</th>
<th>Sg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anticipation</td>
<td>.48</td>
<td>.41</td>
<td>Rational</td>
<td>.47</td>
<td>.40</td>
</tr>
<tr>
<td>Comparison</td>
<td>.25</td>
<td>.35</td>
<td>Affective</td>
<td>.63</td>
<td>.57</td>
</tr>
<tr>
<td>Modification</td>
<td>.42</td>
<td>.50</td>
<td>Imaginary</td>
<td>.56</td>
<td>.52</td>
</tr>
<tr>
<td>Performance</td>
<td>.83</td>
<td>.51</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: $N=262$, low correlations are in bold face
Hypothesis 2b was partly supported, showing a significant stronger expression in the affective domain versus the rational and imaginary domains, for the psychological novel (N=90). The t-tests also showed a significant stronger expression in the imaginary domain versus the rational and affective domains, for science fiction (N=9). Detectives (N=9) only showed a significant weaker expression in the imaginary domain, but not the hypothesized weaker expression in the affective domain. Of course, the results for science fiction and detectives have to be interpreted with caution because of the small samples.

Univariate tests for gender and age showed no significant effects on any of the scales of the QRCL.

Conclusion

In this second study specific hypotheses pertaining to the internal validity of the QRCL were tested. Two approaches showed support for hypothesis 2a, implicating that the intensity of the cognitive processing by the reader as measured by the scales of the QRCL, positively relates to the reader’s appreciation of a literary work.

There is a marginal indication for hypothesis 2b, that specific score profiles for genre exist. Concerning this result, it should be noted that the distribution of books over the reported genres was too unbalanced (science fiction, N=9; psychological novel, N=90; and detective, N=9), in order to estimate the effect with sufficient accuracy. Thus, the question whether stronger expression of particular genres will occur more intensely in different domains of human thinking remains largely open for future attempts of empirical evaluation, that should guarantee sufficient sample size for each of the genres.

The scales of the QRCL seem unbiased for age and gender. However, it should be noted that 75% of the subjects were women and that 85% of the subjects ranged between ages 18 and 22.
STUDY 3: EXTERNAL VALIDITY

Method

Analogous to the QRCL, the ‘Questionnaire Re-Creative Cognition of Films’, or the QRCF, was designed in order to obtain an indication of the external validity, or the extent to which the re-creative cognition approach is generalizable over other art forms (H3). Support for this hypothesis is sought by investigating whether hypotheses 1a, 1b and 2a show similar outcomes for the data of the film questionnaire. For the description of the methods, the reader is therefore referred to the applicable sections from studies 1 and 2. Below, only the sample and the results from the replication research are discussed.

Sample

The QRCF was administered to 504 psychology freshmen who were randomly assigned to one of three conditions: the ‘bad’ condition (N=83), the ‘good’ condition (N=83), and the ‘no-instruction’ condition (N=269). Sixty-nine subjects were not considered in the analysis, because they reported they had never read a literary book, or because they failed to complete the questionnaire. The average age of the freshmen was 21 ranging between 17 and 42, and 73% of the subjects were women.

Results replication of study 1

Scale reliabilities attained values all well above the 0.70 boundary, ranging between 0.84 for anticipation and 0.89 for imaginary, except for the somewhat less heterogeneous rational scale that attained an alpha of 0.76.

Using confirmatory factor analysis, the covariance structure of the structuple scores was analyzed by fitting the seven factors model to the covariance matrix of the subjects from the neutral condition (N=268). Again, the chi-square test resulted in a formal rejection of this model ($\chi^2 =102; df=33; p=0.00$) and the $AGFI = 0.86$ does not attain a sufficient level and the $RMSEA (0.088)$ is above the 0.08 boundary for
acceptable solutions; the 90 percent confidence interval for RMSEA is between 0.068 and 0.11, with a p-value for test of close fit (RMSEA < 0.05) < 0.00. Only the $GFI = 0.94$ exceeds the 0.90 boundary.

The seven-factor model was then fitted to the data of all three conditions; again the chi-square test resulted formally in a rejection of the model ($\chi^2 = 92.81$; $df=33$; $p=0.00$). The alternative fit measures, however, showed slight improvement ($GFI = 0.95$, $AGFI = 0.88$, and RMSEA value (0.086), with 90 percent confidence interval (0.072; 0.10), and a p-value for test of close fit (RMSEA < 0.05) < 0.00.

The value pattern of factor loadings and factor correlations and unique variances for this analysis are similar to the results of the questionnaire for reading, with again a remarkable low factor correlation between modification and performance (-0.59). Also the domain factor correlations are again high (ranging from 0.85 to 0.92), showing considerable overlap between these factors, although the correlations between the observed variables are considerably lower (ranging from 0.71 to 0.74). Similar to the literature study, a possible alternative explanation was sought in a five-factor model with a single domain factor and four process factors; however, this model could not successfully be retrieved from the data.

Finally, the correlations between the seven QRCF scales on the one hand and the six cognitive and 12 personality scales on the other hand, were all acceptable from the point of view of discriminant validity. None of these correlations were substantial and none of these correlations attained values above the 0.30 boundary.

**Results replication of study 2**

The effects of the ‘good’ vs. ‘bad’ conditions are significant (p<0.00), both for the overall multivariate test as well as for each single scale. The effect sizes between ‘good’ and ‘bad’ conditions were average to very high, ranging from 0.51 for anticipation to 1.72 for performance.

The correlations of the QRCF scales with the appreciation score and school grade rating for the no-instruction condition (N=259) are acceptable (0.33) to high (0.64). Only the correlations of the anticipation scale with the appreciation score (0.23) and with the school grade rating (0.14) are low.

The univariate tests for gender and age showed no significant effects on any
Conclusion

The results indicate substantial evidence for the external validity, i.e. generalizability over art forms, of the re-creative cognition model, with high reliability estimates, and most aspects of convergent and discriminant validity supported. Nonetheless, two less favorable aspects of the QRCF were uncovered by confirmatory factor analysis: the strong negative association between modification and performance is unexpected, and the domain factor correlations are high. However, a single domain factor model could not be retrieved from the questionnaire responses, showing that the three domain factors, though highly correlated, are empirically discernible.

Of 378 correlations (7 QCPM scales * 54 cognitive and personality scales) none attained a value higher than 0.30, indicating that cognitive abilities and personality traits do not substantially affect the results. These correlations provide support for the construct validity of the QRCF, as an instrument that measures the effect of narrative motion pictures on viewers, rather than viewer characteristics.

Hypothesis 2a pertaining to the internal validity, or the evaluative power of the QRCF was tested and supported, again using two approaches. Both approaches showed support that the intensity of the cognitive processing as measured by the scales of the QRCF relates positively to the appreciation of the cinematographic work.

The scales of the QRCF show no bias for age and gender, however, it should be noted that 73% of the subjects were women and that 84% of the subjects were in the age range 18 to 22.

STUDY 4: PREDICTIVE VALIDITY

The pseudo-experiments in studies 2 and 3 showed support for the ability of the RCC as a model from which instruments may be derived with the ability to differentiate between people who recalled either ‘good’ or ‘bad’ cultural products.
However, since these were pseudo-experiments it could be argued that these results stem from a halo effect. Such an explanation would imply that readers and watchers judge ‘good’ products, irrespective of differences in cognitive activity, simply higher on the questionnaires scales than ‘bad’ products. To find stronger support for the predictive validity of the questionnaire, i.e., ability to predict whether a group has been exposed to either a higher or a lower appreciated film, a two-group experiment was performed using the QRCF.

Method

Experimental Manipulation

In this experiment, two movies were shown to two different groups of people; one was considered a bad movie, the other a good movie. The movies were selected on the basis of the international movie database (www.imdb.com) that holds information on virtually any movie ever made. Amongst other things, this site enables its visitors to rate movies they have seen. From the database two movies were drawn, that were 1) both A movies, 2) both had played in the theatres 3) were not too far apart in year of making and in genre, but that were available for rent or sale and with a maximum difference in rating. Gus van Sant’s Even Cowgirls get the Blues (1993) was rated by 580 people with a 3.7 on a scale from 1-10. The movie was nominated (1995) for two Razzie awards, for worst actress and for worst supporting actress. Giuseppe Tornatore’s Nuovo Cinema Paradiso (1989) got 5396 ratings with an average of 8.2 on a scale from 1-10, now ranking up to the 123rd place of the all time movie list. The film got many nominations and won many awards, among others the Academy Award for ‘best foreign language film’ (1990).

Sample

Ninety subjects were randomly assigned to either condition, resulting in two groups with 45 subjects. Of the 32 males (36%), 17 watched the ‘good’ movie and 15 attended the ‘bad’ movie. After viewing the movie, the QRCF was administered to
both groups.

Additional measures

The aforementioned appreciation scale and school grade were again assessed. In addition 27 words, representing concepts referred to by Finke et al. (1992) as preinventive sproperties, that are typically used by critics to label cultural products (e.g. novel, ambiguous, congruence, thrilling, varied) were administered, to investigate to what extent these items would differentiate between conditions. For each word the subjects were asked to rate these words on a five point rating scale, ranging from 1 to 5 (very applicable).

Statistical Analysis

Scale means between the good and the bad conditions were compared with \( t \)-tests, and effect sizes (ES) were calculated. Appreciation scale and school grade were correlated with the scales of the QRCL. Finally, t-tests were performed on the means of the evaluative items, for an explorative investigation of the possibility that these concepts provide an alternative explanation.

Results

Table 4.8 presents the scale means, standard deviations, the significance of the \( t \)-tests, and effect sizes. Five scales differentiate significantly between the good and the bad condition and with large effect sizes, ranging between 0.60 and 1.49. The comparison and modification scales have very small effect sizes (0.39 and 0.14 respectively) and do not significantly discriminate between conditions.

Correlations with the appreciation scale ranged between 0.40 (modification) and 0.83 (performance). Correlations with school grade ranged from 0.45 (modif.) to 0.73 (affective). T-tests on the means of the 27 typical labels showed that six items significantly discriminated between conditions, a unity (ES= 1.19), empathic (ES= 1.04), predictable (ES= 0.81), meaningful (ES= 0.77), superficial (ES= 0.56), and simple (ES= 0.44).
**Psychology of Entertainment**

**Table 4.8** Means, standard deviations, significance(p) and effect sizes (ES) of Cowgirls vs. Cinema Paradiso

<table>
<thead>
<tr>
<th>Scales</th>
<th>Cowgirls (bad)</th>
<th>Cinema Paradiso</th>
<th>p</th>
<th>ES</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>Rational</td>
<td>88.38</td>
<td>15.29</td>
<td>100.71</td>
<td>15.28</td>
</tr>
<tr>
<td>Affective</td>
<td>84.38</td>
<td>19.58</td>
<td>106.24</td>
<td>18.86</td>
</tr>
<tr>
<td>Imaginary</td>
<td>88.13</td>
<td>17.13</td>
<td>99.58</td>
<td>20.79</td>
</tr>
<tr>
<td>Anticipation</td>
<td>64.07</td>
<td>14.06</td>
<td>79.67</td>
<td>19.10</td>
</tr>
<tr>
<td>Comparison</td>
<td>60.47</td>
<td>15.93</td>
<td>66.73</td>
<td>15.80</td>
</tr>
<tr>
<td>Modification</td>
<td>65.18</td>
<td>11.22</td>
<td>66.89</td>
<td>13.56</td>
</tr>
<tr>
<td>Performance</td>
<td>71.18</td>
<td>16.77</td>
<td>93.24</td>
<td>12.94</td>
</tr>
</tbody>
</table>

**N**

45

**Conclusion**

Five of the scales indeed provide an instrument to measure the quality of a movie, whereas the comparison scale, although not significant, still attains a small effect size. The modification scale does not seem to differentiate between the conditions. Besides the inability of the modification scale to differentiate between conditions, it also shows the lowest association with the appreciation scale and school grade. The discriminating power of the judgment free scales of the QCPF is placed in perspective by the fact that of 27 typical labels, only six showed significant discriminating ability between these two movies, with effect sizes that are in the same range as those of the QCPF.

**DISCUSSION**

The concept of re-creative cognition was operationalized with a model for cognitive processes that may play a part in the evaluation of cultural products. The model discerns four cognitive processes that may function within three domains of human consciousness. Using facet theory and typical measures two instruments with reliable scales for the evaluation of cultural products, i.e. literature and film, were constructed based on this model. Hypotheses concerning the construct, internal, external and predictive validity of the model were investigated, and in most cases confirmed.
Chapter 4: Re-Creative Cognition

In the first study support was sought for the construct validity of the questionnaire for literature, showing that the hypothesized processes and domains are indeed empirically discernible, and showing that the questionnaire seems to measures qualities of books rather than personality traits or cognitive abilities. These findings were reaffirmed in study 3 for viewers of motion pictures. Regarding the structure of the RCC model that the literature and film questionnaires are based on, the model was fitted on two sets of data for both instruments, which attained an acceptable goodness of fit level in the case of literature and a somewhat poorer fit for film. Nonetheless, the similar parameter pattern that is found for literature and film, and the fact that the fit for the film model is only marginally below the level of acceptability, is interpreted as support for the model. The fit measures and the parameter pattern underscore that the RCC can be recovered from the respective questionnaire responses. Although, the domain factors are highly correlated on a latent level, it was impossible to fit a model with a single domain factor on the data, indicating that the domain elements are indeed empirically discernible.

Study 2 showed that the amount of cognitive activation indeed relates to aspects of books, i.e., the appreciation of the literary works, both in a pseudo experiment and in a correlational analysis. Evidence was found that readers, who recalled books they appreciated, show significantly higher scores on the cognitive-processing scales than those readers who recalled books they did not appreciate. In addition, sufficiently high correlations were found between the appreciation scale and the school grade for quality on the one hand and the QRCL scales on the other hand, also substantiating the hypothesized relation. Again, these findings were underscored by the results for film viewers in the third study. An interpretation of these results in terms of a halo-effect would imply that on the whole, readers and watchers judge ‘good’ books and movies higher on the questionnaires scales than ‘bad’ books and movies, irrespective of differences in cognitive activity. Yet, the items of the questionnaires do not use words like good or bad, but merely measure more or less cognitive activity. In addition, such a halo-interpretation would not provide an unambiguous explanation for differences in correlations, which are found between the questionnaires scales and appreciation and school grade, nor for the differences of the effect sizes between readers and viewers of good and bad books and movies. In
particular the difference between lowest and highest effect size of the scales of the questionnaires is 1.00 for both instruments. These differences in correlations and effect sizes are difficult to explain with a simple halo-interpretation, whereas a cognitive interpretation not necessarily implies the same levels of effect for every dimension. Another counterargument could be that the elements of the structures facet, i.e., structural and stylistic principles, are equally distributed across the respective scales. If subjects only judge word meanings, this structures facet would become a large source of variance in the QRCL scales, and the processes and domains facets would have a weaker presence in the responses. For another aspect of books, genre, an indication was found for a stronger expression in the emotional domain than the rational and imaginary domains for psychological novels; the two other genres unfortunately reached insufficient sample size to draw conclusions about the hypothesized effects.

Study 3, the replication of the literature studies for the cognitive processing of film support the external validity of the re-creative cognition approach, i.e., the generalizability over art forms. In addition, the similarity of the outcomes that were found between the literature and film models may also be regarded as considerable support for the re-creative cognition approach as a whole by reaffirming the construct and internal validity of the proposed model.

Study 4 investigated the predictive validity of the film questionnaire scales on the appreciation of films with a two-group experiment. Except for modification, the results indicated stronger cognitive processing for higher appreciated motion pictures. Ratings of 27 preinventive properties, i.e., properties traditionally considered important features of the quality of cultural products, showed that the levels of effect as measured by the scales of the film questionnaire were similar to the levels of effect that 6 of 27 of preinventive properties attained.

Although the model fit showed that all process and domains were empirically discernible, some problems were found for the modification scale. In the model fit for both literature and film, the modification scale seems to have a negative relation with the performance scale, indicating that more anticipation results in decreased modification. In addition the modification scale is the only scale that has no predictive validity on the appreciation of films in the final experiment, indicating that
the amount of modification has no relation with the appreciation of the evaluated films. From the model fit it has to be concluded that the modification process appears to be active during processing, however without a linear positive relation with appreciation of the work, which may be explained by Berlyne’s (1974) curvilinear findings that disturbance increasing decreases the hedonic value past the optimum. The negative relation between modification and performance may indicate that books, or films that hinder performance induces modification, after all the less sense a movie makes, the more someone will searching for the needed modifications to create a coherent story. As this may be the case for both good and bad movies, the modification scale has no relation with the appreciation of the work is found.

Despite the inability of the modification scale to differentiate between conditions, the scale shows small but significant correlations with the appreciation scale and school grade. However, these correlations are interpreted as a halo-effect as these are correlations with the overall judgments of the quality of the movie that include the within group variance.

This finding may also be an indication for the involvement of two types of cognitive processes as distinguished by Finke et al. (1992): generative processes such as anticipation, comparison and performance that have a positive linear relation with the appreciation of the evaluated work, and exploratory processes such as modification that may have a curvilinear association with the appreciation of the evaluated work.

The fact that cognitive processes take part in the evaluation of cultural products provides substantial support for the field of cognitive psychology as a whole. The findings may also offer additional insight to the question whether specific processes are involved in such fields as human reasoning (Meili, 1981; Sternberg, 1994), problem solving (Duncker, 1945; De Groot, 1978; Mumford et al., 1997; Newell et al., 1958, 1962; Selz, 1913), mental models (Johnson-Laird, & Byrne, 1993) and creativity (Gruber et al., 1962; Finke et al., 1992; Sternberg, 1998), or whether a limited number of cognitive processes may be responsible for human thought of any kind. The current research makes no statements pertaining to possible relations among the processes, not answering questions whether certain cognitive processes trigger others, whether these processes maintain a cyclic or dynamic
relation to each other as presumed in Selz’s theory, or whether different cognitive processes function independent of each other.

The involvement of different domains in the evaluation of cultural products were less supported, as the identified domains, although discernible, appear to be highly correlated, indicating substantial overlap.

How does the RCC model relate to the field of empirical esthetics, and literature and motion picture reception? Assumptions from experimental esthetics that esthetic pleasure is enhanced by recreating or recomposing a work of art (cf. Boselie, 1979), while filling in the blanks (Iser, 1978; Fauconnier, 1984), are given concrete form in the RCC and were operationalized by means of the literature and film questionnaires.

Finally, since the amount of cognitive activation for most domains and processes positively relates to the esthetic pleasure offered by a cultural product, the measure of activation may function as a predictor of the esthetic judgment of the art perceiver, and consequently, as a less subjective predictor of the quality of a creative product. Studies pursuing creativity have developed software, for instance BACON and HUYGENS (Cheng & Simon, 1995; Sternberg, & Lubart, 1996) emulate the creative scientific discovery process and Johnson-Laird’s (1988; 1991) program improvises jazz. It seems, however, crucial to these studies to understand the perception of creative products as well, for creativity is defined by its reception. In understanding the processes that may be responsible for re-creating, the processes responsible for creating may be better understood and subsequently be implemented in these emulation programs.

What does the future look like for re-creative cognition? A next step may be to create domain and process profiles for books and films, to understand the effect of specific properties of these products on specific processes. Subsequently, the success or failure of literary and cinematographic works may be understood in terms of the processes they activate or lack to activate and the domains they seize upon. Then, one day, an emulation program, such as Johnson-Laird’s (1988; 1991) jazz program may be designed to create novel motion pictures or literature.
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