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Article in *Thinking Skills and Creativity* · December 2012

DOI: 10.1016/j.tsc.2012.04.006

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## Essential skills for creative writing: Integrating multiple domain-specific perspectives

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### ARTICLE INFO

#### Article history:

Received 4 October 2011

Received in revised form 25 March 2012

Accepted 12 April 2012

Available online 25 April 2012

#### Keywords:

Creative writing

Writing skills

Creative cognition

Rasch measurement

Expert judgment

### ABSTRACT

The aim of this work was to gather different perspectives on the “key ingredients” involved in creative writing by children – from experts of diverse disciplines, including teachers, linguists, psychologists, writers and art educators. Ultimately, we sought in the experts’ convergence or divergence insights on the relative importance of the relevant factors that may aid writing instruction, particularly for young children. We present a study using an expert knowledge elicitation method in which representatives from five domains of expertise pertaining to writing rated 28 factors (i.e., individual skills and attributes) covering six areas (general knowledge and cognition, creative cognition, conation, executive functioning, linguistic and psychomotor skills), according to their importance for creative writing. A Many-Facets Rasch Measurement (MFRM) model permitted us to quantify the relative importance of these writing factors across domain-specific expertise, while controlling for expert severity and other systematic evaluation biases. The identified similarities and domain-specific differences in the expert views offer a new basis for understanding the conceptual gaps between the scientific literature on creative writing, the writer’s self-reflection on the act of writing creatively, and educators’ practices in teaching creative writing. Bridging such diverse approaches—that are, yet, relatively homogeneous within areas of expertise – appears to be useful in view of formulating process-oriented writing pedagogy that may, above all, better target the skills needed to improve children’s creative writing development.

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## 1. Introduction

Writing is a recursive process involving both cognitive and metacognitive skills (Larkin, 2009) and critical for academic and vocational achievement (e.g., Graham & Perin, 2007; Hirsch, 1987). Ways to develop effective writing instruction from a young age are therefore of great interest. Teaching creative writing – that is, encouraging students to write by drawing upon their imagination and other creative processes – may support writing development in all its components. Creative writing is often defined as the production of fictional narratives (non-documentary, non-academic) or written representations (Nettle, 2009). Others define creative writing more broadly to include nonfiction (Root & Steinberg, 1999) or as a form of writing

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that is unusually original while operating under appropriate constraints of structure and language (Sharples, 1996). Creative writing is an open-ended design process that builds on creativity and is relevant to children's thinking skill development (e.g., Chen & Zhou, 2010). It can help children explore and understand the functions and value of writing, contribute to improving their reading and writing skills (e.g., Essex, 1996; Shanahan, 2006; Shatil, Share, & Levin, 2000; Tompkins, 1982), and may also help teach them how to approach life in a creative way (Sternberg, Kaufman, & Kaufman, 2009). Furthermore, engaging the imagination during the process of learning through writing helps ensure that facts (and other forms of knowledge) are enlivened and imbued with personal meaning through interpretive and constructive processes: the knowledge encoded through these processes will, in turn, serve as fuel for future imaginative thinking and learning (Gallas, 1994; Newell, 2006; Runco, 2009). Young children are especially imaginative, yet educational learning environments can support or *impede* the development of children's imagination (Eckhoff & Urbach, 2008). The question is: What are the most important skills to consider when teaching young children creative writing?

The study of creative writing within different disciplines has led to different perspectives and different instructional approaches, each emphasizing a different set of “key ingredients” (that is, essential skills) for optimal creative writing. Based on our related work (e.g., Tan et al., 2012), the goal of the research presented here is to study the convergence and divergence between these disciplines through the relative weights they attribute to the various skills involved in creative writing. We first (a) identify the domains of expertise that may provide useful perspectives on creative writing; and (b) highlight the skills that are thought to contribute to individual differences in creative writing.

### 1.1. Domain specific perspectives on creative writing

Creative writing constitutes a promising topic for interdisciplinary conversation (Doyle, 1998); it has been studied by various fields, providing complementary views in literary publications, psychological works on creativity, autobiographical essays by creative writers, linguistics research, and educational research, including work from several sub-domains of education such as art education (Tan et al., 2012). While psychological studies and portraits of writers often emphasize the creative/cognitive processes and other individual factors that lead to successful writing, including creative writing (e.g., Bereiter & Scardamalia, 1987; Flower & Hayes, 1981; McCutcheon, 2006; Torrance & Galbraith, 2006), writers themselves tend to focus on the broader themes, actions, and “inner forces” by which they live and write (e.g., Bland, 2011; Olsen & Schaeffer, 2011; Pack & Parini, 1991; Perry, 2005, 2009; Roberts, Mitchell, & Zubrinich, 2002), while linguists focus on the structural aspects of language that contribute to the development of writing (e.g., Tucha, Trumpp, & Lange, 2004). Educators are primarily concerned with writing instruction (rather than creative writing specifically), which varies a great deal among teachers (e.g., Graham, Harris, MacArthur, & Fink, 2002), but they generally value systematic skill instruction and information learning, and emphasize process over product. Finally, creative writing has become a somewhat unexpected focus in some art education programs (e.g., Danko-McGhee & Slutsky, 2007; Ehrenworth, 2003; Ernst, 1997; Mulcahey, 2009; Olsen, 1992; Olshansky, 1994), which build on skills such as observation and imagery as significant contributors to creative writing (Jampole, Konopak, Readence, & Moser, 1991; Long, Hiebert, Nules, & Lalik, 1985). For example, some museum education programs that capitalize on children's visual literacy to improve creative writing outcomes have emerged internationally and yielded a new perspective on possible key factors that may contribute to the development of children's creative writing skills. Examples of these programs include “Teaching Literacy Through Art,” 2004–2006, at the Guggenheim Museum, NYC (Kennedy, 2006); “Visual Paths to Literacy,” 1999–2002, and “Young Cultural Creators,” 2001–2002, at the Tate Britain and Tate Modern, respectively, London (Meecham, 2002); and “Seeing, Connecting, Writing,” 2009–2010, at the Yale Center for British Art, New Haven (Tan et al., 2012).

### 1.2. Essential skills for creative writing

Among the numerous approaches to creative writing presented by each of the disciplines cited above, the many skills thought to be involved in creative writing are not always emphasized equally in the literature. In fact, creativity research in general now lists almost 300 components (skills, features, individual and environmental factors) that may be involved in creativity (Treffinger, 2009). Yet, the “ingredients” of creative writing that are differentially underlined in each of the domains cited above belong thematically and conceptually to six broad categories of factors: (a) general knowledge and cognition, (b) creative cognition, (c) executive functioning, (d) motivation and other conative characteristics, (e) linguistic and literary, and (f) psychomotor. The latter may be especially relevant for young writers (and domains concerned with early stages of writing development) – our main focus here – however, the other categories may be deemed important across age, as they are often discussed in the literature on children, adults, and “expert” writers. A comprehensive analysis of all these categories of factors cannot be offered here, but we briefly describe the main factors representing each category.

#### 1.2.1. General knowledge and cognition

General knowledge and cognition factors are central to the development of writing skills. They include *intelligence*, particularly verbal intelligence (Berninger, Cartwright, Yates, Swanson, & Abbott, 1992; Coker, 2006); *working memory* (e.g., Berninger et al., 1992; Coker, 2006; Harris, Graham, & Mason, 2006; Kellogg, 2008), which allows the recall of knowledge in a workable form; *evidence-based inferencing*, the process of drawing logical conclusions from factual details (e.g., Flower & Hayes, 1981); and *knowledge*, including topic knowledge (Stein, 1986) and knowledge on the writing process itself (e.g.,

Berninger et al., 1992; Kellogg, 2008; McCutcheon, 1986). Writers also demonstrate *cognitive flexibility* (Stein, 1986) and are able to *integrate* or *synthesize* what they know into a coherent composition (Flower & Hayes, 1981). As emphasized by art educators and writers themselves, *observation*, a cognitive skill that stimulates the use of mental imagery, is essential to descriptive writing (e.g., Berninger et al., 1992; Coker, 2006; Juel, 1988). Similarly, *visualization* is critical for representing nonverbal knowledge in written form and facilitating the recall or creation of mental images that may enhance written description (e.g., Berninger et al., 1992; Coker, 2006; Juel, 1988) and the originality of a piece of writing (Jampole et al., 1991; Long et al., 1985).

### 1.2.2. Creative cognition

Creative writing requires *originality*, or the ability to generate unique ideas (e.g., Ward, Smith, & Fink, 1999), and *selective combination* – the recombination of the elements of a problem to change its representation (e.g., Pretz, Naples, & Sternberg, 2003) – to creatively solve problems related to the writing process, or to produce original story elements. *Associative thinking* brings together ideas that might not be typically associated with each other (as defined by Mednick, 1962) and can sometimes produce rare and valuable ideas. Finally, *divergent thinking* – the process of producing a broad range of ideas in response to a given stimulus – is a generative thinking skill often viewed as the cognitive essence of creativity (e.g., Guilford, 1967, 1977). These sub-level abilities, components of creative cognition, are supported by a higher-order construct: *imagination*. Imagination is a form of playful thinking that creates new patterns of meaning by drawing on previous experiences and combining them in unusual ways (PolICASTRO & Gardner, 1999), forming the basis for creative cognition.

### 1.2.3. Motivational and conative factors

As often noted by creative writers themselves, *intrinsic motivation* appears to be one of the major conative dimensions involved in creative writing (Amabile, 1985; Coker, 2006; Kellogg, 2008). It reflects the personal desire to express one's knowledge or thoughts on a subject through compositional activity. Baer, McKool, and Schreiner (2009) suggest that under some conditions, *extrinsic motivation* is also useful in the writing process, to help students get through difficult writing assignments. For example, motivators such as school-related rewards may encourage students to commit effort to their writing, even if they do not initially show interest in the task (e.g., Coker, 2006). Correspondingly, Magnifico (2010) emphasized audience as an important external motivator for professional writers, pointing out the evident role of a reward system for the creative process. Creative writing also requires *intention*, to monitor and direct actions (e.g., Graham & Harris, 2000; Hayes & Flower, 1980) or set goals that specify intended outcomes (Zimmerman & Risemberg, 1997), as well as *perseverance*, which enables individuals to weather adversity to accomplish their goals (Zimmerman & Kitsantas, 2002). As in other domains, creative work in writing involves *risk taking* (Sternberg, 2000) and *tolerance for ambiguity* (e.g., Barron & Harrington, 1981; Golann, 1963; Sternberg & Lubart, 1995; Urban, Ambrose, Cohen, & Tannenbaum, 2003; Zenasni, Besancon, & Lubart, 2008), a personality trait that corresponds to the way in which an individual tends to perceive and deal with ambiguous situations or stimuli. These personality traits and other conative variables are often described among eminent cases of creative individual, but they are also highly investigated in psychological studies of creativity in children, where they are generally viewed as enabling factors for the effective use of the cognitive factors involved in the creative process.

### 1.2.4. Executive function

Executive functions, such as *planning* and organizing ideas, are central to the writing process (e.g., Graham & Harris, 2000). Without the ability to sequence ideas, students lose the structure of their narrative (Hayes & Flower, 1986). Writers also need *concentration* to focus their attention on managing the writing environment or dealing with constraints that may be inherent in the writing task (Graham & Harris, 2000).

### 1.2.5. Linguistic and literacy factors

Linguistic factors refer to the basic language skills that are involved in assembling words into meaningful sequences. Meaningful writing demands the translation of ideas into written form and thus involves a complex array of lower and higher level linguistic skills, such as the ability to build sentence structures and construct meaning using context; *elaboration*, the generation of details (Gardner, 1991); *description*, the use of words to arouse readers' visualization and imagination through imagery (e.g., Sadoski, Kealy, Goetz, & Paivio, 1999); *vocabulary*, including metaphorical language, to achieve creative written expression (Baker, Gersten, & Graham, 2003); and knowledge of the larger, organizing structures of language that support meaningful text, such as *narrative framework* (McKeough, Palmer, Jarvey & Bird, 2007), essentially the introduction of a problem, with particular characters and setting, which includes a beginning, a middle and an end. Finally, *reading comprehension*, the receptive aspect of writing, is a basic linguistic skill highly related to the ability to write (e.g., Abbott & Berninger, 1993; Coker, 2006; Juel, 1988).

### 1.2.6. Psychomotor factors

In addition to linguistic and literary skills, *penmanship* or handwriting is a lower level skill that may affect one's ability to write. Lack of mastery of low level transcription skills (i.e., spelling and handwriting) can impede writing development in novice and struggling writers because when these skills are not automatic, they demand attentional resources that otherwise

would be devoted to higher level processes, such as planning and revising (Graham & Harris, 2000) or generating new ideas. Correspondingly, Juel (1988) indicated that mastery of spelling and handwriting contribute to writing development.

### 1.3. Present study

As reviewed above, there are numerous factors that those concerned with developing creative writing skills and writing abilities more generally – namely teachers, psychologists, writers, linguists and art educators – deem essential for creative writing. In this introduction and related reviews of the literature (e.g., Tan et al., 2012), we emphasized that these different areas of expertise all bring attention to domain-related sets of skills, while often disregarding other skills that may be important for creative writing. This is consistent with Hoffman, Shadbolt, Burton, and Klein (1995), who note that “expertise” is not a simple category: it is domain-specific and relies on automated thinking processes (Shanteau, 1992). The present study capitalizes precisely on the different experts’ knowledge according to the five domains of expertise described above, to survey the relative weight given within each domain on a set of factors theoretically contributing to creative writing. Specifically, the main objective of this study was to elicit and interpret divergent experts’ views on the importance of the various skills necessary for creative writing across relevant domains of expertise (hypothesizing that homogeneity of judgment would be observed within each domain), as a first step toward the integration of these multiple domain-specific approaches into a unified perspective for the enhancement of writing instruction for young children.

## 2. Method

Expert knowledge elicitation methods are used in many applications and in diverse fields such as psychology, political science, sociology, and ecology (Benoit & Wisenheimer, 2009; Landeta, 2006). Various methods are described in the literature, including the consensual assessment technique classically used in creativity research (e.g., Hennessy & Amabile, 2010) or the Delphi method (e.g., Landeta, 2006), among many others. These methods rely on the idea of the superiority of group opinion over the individual’s, and on the greater relevance of the use of expert opinion in inexact sciences (Landeta, 2006). In psychology, a common context in which expert knowledge elicitation methods are used is the evaluation of content validity in test development (e.g., Lynn, 1986). Indeed, content validity is largely a matter of expertise, involving two distinct phases: a priori efforts (by test developers) to enhance content validity through careful conceptualization and domain analysis prior to item generation, and a posteriori efforts to evaluate the relevance of the scale’s content through expert assessment (e.g., Lynn, 1986; Polit & Beck, 2006). The study presented here is modeled upon the classical analyses of content validity (e.g., Rubio, Berg-Weger, Tebb, Lee, & Rauch, 2003): after a survey of the literature to identify the key factors (items) for creative writing, we sought to evaluate the relevance of these factors by multiple experts. However, we supplemented this classical approach by recruiting experts from diverse domains to cover a broad spectrum of expertise, but more interestingly, to analyze differences and overlaps across domains in the evaluation of the selected factors.

### 2.1. Participants

Expert knowledge elicitation methods involve a panel of experts, generally defined as distinguished professionals who have special skills or knowledge derived from extensive experience within subdomains, are highly regarded by their peers, and whose judgments are uncommonly accurate and reliable (Hoffman et al., 1995). Therefore, these methods perform very well with limited sample sizes, as little as two experts (e.g., Lynn, 1986; Rubio et al., 2003). When sub-samples of experts are involved, as is the case in the present study, Rubio and colleagues (2003) recommend the use of at least three experts for each group (i.e., to represent each domain or sub-domain). Following these recommendations, we recruited a sample of 15 experts in writing, aged 29–63 years old ( $M = 48.1$ ,  $SD = 11.5$ ) from each of the five domains of expertise reviewed above: Teachers (T), Psychologists (P), published Writers (W), Linguists (L) and Museum Art-educators (M). Specifically, each group consisted of three professionals highly experienced and qualified in their domain of expertise, with at least 10 and up to 35 years of expertise ( $M = 20.5$ ,  $SD = 9.2$ ).

Specifically, the expert teachers have all taught at the elementary school level, including curriculum based writing and other specialized aspects of language arts; their expertise in teaching writing has been acknowledged by their positions in the field, such as “Director of Curriculum and Instruction,” or their consulting activity in reading and writing programs. The expert psychologists earned their PhDs 10–20 years ago and conduct their research at major universities on various aspects of cognitive ability, two of them specializing in issues of literacy and language difficulties, and they are published authors in the field of reading and creative writing. The writers are experienced professional who have published creative work, either in the form of creative non-fiction, novels, plays or screenplays; although all are recognized authors, some have received very specific writing tuition (e.g., newspaper editor) while others have unrelated backgrounds. The experts in linguistics have gained their expertise within academic settings at the PhD level, and are published authors; two conduct research on issues concerning the development of reading and writing skills in children. Finally, the Museum Art educators have each worked in museum education, leading classes and developing and coordinating educational programs in the museum setting for at least 10 years. At the time of the study, they each held a leadership position in a well-established art museum – either as director of the institution or head of the education department, and they are all concentrating their educational effort in



museum-based programs aiming to improve writing outcomes. All experts were recruited by members of our research team within their professional network and via email (the experts, however, were not familiar with the goals of this study).

## 2.2. Measure and procedure

Each expert was asked to fill out an online survey in which we asked them to rate the relative importance of each of 28 identified “candidate” skills that are thought to contribute to creative writing, using a 7-point Likert scale (from 1 – not important at all, to 7 – highly important). Specifically, the instructions prompted the participants to share their expertise to help us “review and refine the set of basic processes and abilities involved in the development of good creative writing skills (e.g., stories, narratives).” The candidate skills (factors), conceptually grouped into six categories, were the following:

- *General knowledge and cognition*: integration/synthesis, inferencing (making inferences from evidence), working memory, observation, visualization (as a process of imagery), intelligence, knowledge, and flexibility (cognitive flexibility).
- *Creative cognition*: imagination, associative thinking, selective combination, divergent thinking, and originality.
- *Motivational and conative factors*: intrinsic motivation, extrinsic motivation, risk taking, tolerance for ambiguity, perseverance, and intention.
- *Executive function*: planning/organizing, concentration.
- *Linguistic and literary skills*: generation of description, elaboration, development of vocabulary, expressiveness, reading comprehension, and narrative framing (logical sequence and story structure).
- *Psychomotor factors*: penmanship (fine motor skills).

All of these factors were explicitly defined and presented to the experts in random order (see the complete survey in [Appendix A](#)). In addition, the survey contained a text field at the end to collect any additional factors suggested by the experts. These selected skills were thought to represent properly the various categories of individual factors important for creative writing, and were presumably relevant for any developmental level and degree of expertise (from young children's to expert adult writing), although (a) further applications of the current study were to primarily target early creative writing instruction (i.e., school level), and (b) it is possible that some factors (e.g., penmanship) would be more relevant at some developmental stages, than at some others. However, the relative importance of each factor according to age is unclear in the literature, and was not a specific focus in this study.

## 2.3. Data analyses

There were 28 items assessed and 15 experts, yielding a total of  $15 \times 28 = 420$  observations. The data were analyzed using a Many-Facets Rasch Measurement (MFRM) approach ([Linacre, 1994](#)) as implemented in FACETS ([Linacre, 2009](#)). This approach has been employed as an alternative to the classic Consensual Assessment Technique (e.g., [Amabile, 1982](#)) for fine-grained expert-based assessment of various creative products (e.g., pieces of writing, paintings, musical composition, e.g., [Leung, Wang, & Lee, 2009](#)) when these are scored by multiple raters. Similarly, MFRM was recognized as a powerful technique for applying expert judgment in content validity-type analyses ([Zhu, Ennis, & Chen, 1998](#)) a context very similar to the present study. MFRM is a conjoint measurement item-response (IRT) model, which, in the case of rating scales, employs logistic transformation to convert qualitative observations into linear quantities by explicitly modeling responses as functions of item and person characteristics (e.g., [Linacre, 1994](#)). The use of joint maximum likelihood estimation method (JMLE) allows the ascertainment of parameters that maximize the probabilities of observing particular sets of responses, thereby providing a precise probability-based adjustment to the calibration of raw data. The basic condition for doing so is the achievement of consistency in experts' ratings, which is also estimated in MFRM models. In addition to providing estimates of the relative consistency of experts and the degree of agreement between them, this approach allows the evaluation of the extent to which each expert is using the scoring rubric in a manner that is internally consistent.

Here, we specified a four-facet MFRM model of item responses (i.e., ratings assigned to a particular item<sup>1</sup>) as functions of a set of facets in the model (i.e., items, item types, experts, and expert groups). The ratings of the individual items provided by the experts were used to arrive at a stable calibration of items, item types, experts, and expert group parameters on a common logit scale exempted of differences in severity and other systematic biases, permitting their direct comparison. Another advantage is that the MFRM approach allows to investigate systematic biases in expert ratings by performing a differential facet functioning analysis (DDD; see [Bond & Fox, 2007](#); [Linacre, 1994](#)). Such analysis helped us determine whether the rankings of the writing factors (items) were consistent or systematically biased across domains of expertise, revealing domain-specific “preferences” in rating the candidate factors.

<sup>1</sup> For the sake of clarity, we will use the term “item” to refer to the selected 28 factors – or skills – involved in creative-writing.

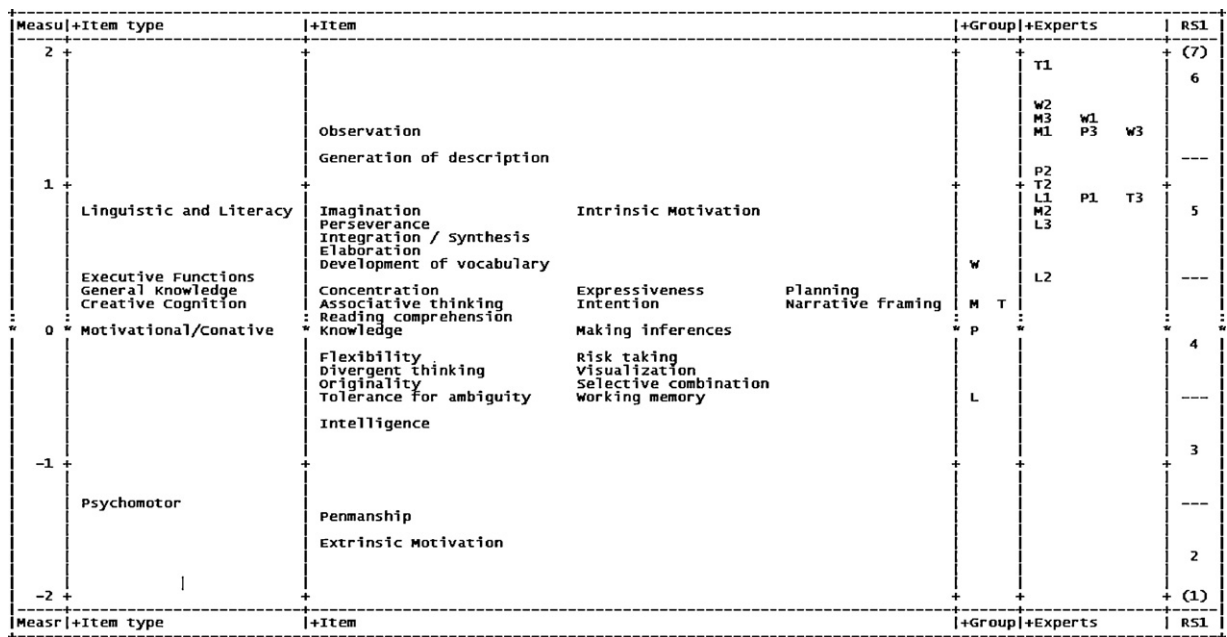


Fig. 1. Items, item groups, experts and expert groups map, based on Rasch calibrations for model<sub>3</sub>.

### 3. Results

#### 3.1. Measurement model

The local fit<sup>2</sup> indices (infit and outfit) of the first four-facet MFRM model (model<sub>1</sub>) were examined to investigate the quality of the measurement. The infit and outfit values are local misfit statistics that indicate the amount of noise in the measurement model. In general, values below 1.00 indicate higher than expected predictability (overfit), whereas values over 1.00 indicate unpredictability. Yet, values in the range .50–1.50 are considered acceptable, and absolute values over 2.00 indicate that an element of the facet distorts the measurement system (Linacre, 2009). Due to the restricted sample size in this study, we followed less stringent guidelines and considered values within the range from .50 to 1.70 acceptable (see Bond & Fox, 2007, p. 243).

The analysis of the fit indices revealed a high degree of misfit for three items (Narrative framing, infit = 2.54, outfit = 2.75; Reading comprehension, infit = 1.95, outfit = 1.89; Development of vocabulary, infit = 1.84, outfit = 2.08) and for one expert (L3, infit = 1.98, outfit = 1.82). In other words, these elements of the model (i.e., three items, and one expert) affected negatively the overall fit of the model. To avoid influences from these misfitting elements on the overall quality of the measurement model, a second MFRM model (model<sub>2</sub>) was estimated omitting these elements. No other elements were found to display high degrees of misfit. However, in order to include the four misfitting elements mentioned above in the measurement model, a third model (model<sub>3</sub>) was fitted, using the parameter estimates obtained for model<sub>2</sub> and allowing the parameters for the four misfitting elements to be estimated freely in the new “anchored” model.

This final MFRM model (model<sub>3</sub>) with the four facets indicated no misfitting elements other than the four mentioned for model<sub>1</sub>, with 56.17% of the total variance explained by the Rasch measures (global fit data log-likelihood  $\chi^2[52] = 880.01$ ,  $p < .001$ ). The results also indicated a high item reliability<sup>3</sup> (.82) and item type (i.e., categories of writing skills) reliability (.93) suggesting that the same ordering of the items and item types would be obtained if they were presented to different experts. Expert and expert group reliabilities were also high (.71 and .81, respectively). The multifaceted Rasch calibrations of items, types of items, experts and expert group parameters in the present study are summarized in Fig. 1. The first column (“Measure”) is the unified scale from the Rasch analysis. The calibration uses a –2 to +2 logit scale to measure all of the aspects (facets) of the assessment results: writing factors (items), item types, experts, and expert groups. Each element of a given facet is placed on a specific level on the scale according to its estimated parameter (logit score), which maximizes

<sup>2</sup> Our analysis of the measurement models fitted in the study will focus almost exclusively on the local fit and reliability indices, parameter estimates, and DFF statistics. See Linacre (2009) and de Jong and Linacre (1993) for a discussion on the use of global fit indices in Rasch models.

<sup>3</sup> The reliability indices obtained through FACETS indicate the quality of differentiation of measurement items on the measured variable, that is, the degree to which the ordering of the parameters is replicable. The indices are based on the same concept as Cronbach's alpha (Cronbach, 1951), and can be interpreted using the same guidelines that apply to alpha (see Bond & Fox, 2007). That is, coefficient over .70 indicates acceptable reliability, while coefficients over .80 generally indicate good reliability.

**Table 1**  
Model<sub>3</sub> calibration parameters for experts.

Expert	Obs. avg.	Fair avg.	Measure (leniency)	SE	Infit	Outfit
L1	4.86	5.18	0.91	0.19	1.03	1.03
L2	4.29	4.53	0.32	0.18	1.74	1.69
L3	4.54	4.94	0.69	0.18	3.32	3.11
M1	5.64	5.68	1.41	0.22	1.27	1.79
M2	5.36	5.08	0.82	0.20	0.70	0.81
M3	5.71	5.72	1.46	0.22	1.75	1.75
P1	5.25	5.16	0.90	0.20	1.01	1.18
P2	5.57	5.39	1.11	0.20	0.50	0.51
P3	5.71	5.70	1.44	0.21	0.67	0.74
T1	6.11	6.05	1.87	0.24	0.90	0.96
T2	5.43	5.23	0.96	0.20	1.30	1.27
T3	5.25	5.18	0.92	0.20	1.04	1.10
W1	6.11	5.78	1.53	0.24	1.38	1.09
W2	6.07	5.83	1.59	0.24	0.74	1.00
W3	5.82	5.62	1.36	0.23	2.19	2.40

L = linguist; M = museum educator; P = psychologist; T = teacher; W = writer; Obs. avg. = observed average score; Fair avg. = fair average, a transformation of the Rasch measure back into an expected average raw response value, adjusting raw ratings for other elements of other facets (e.g., leniency); Measure = a logit measure of leniency; SE = standard error.

the joint probability of observing a particular set of responses in the data. For example, in the third column (item) the item “extrinsic motivation” is placed at about  $-1.60$  on the Rasch scale, based on all the ratings it received after adjusting for the diverse severity levels of the experts and groups. The column “Group” represents the ordering of the expert groups as a function of their severity. The Linguist group “L” appears to be more severe (lower logit score), whereas, the Writer group (“W”) is more lenient. Similarly, the map suggests that experts L1, P1 and T3 showed an identical level of leniency (which does not reflect their specific ranking of each items) with logit scores around  $.90$ .

### 3.2. Expert and expert group calibration and consistency in ratings

Table 1 reports the calibration results for the experts. As expected, the experts differed in severity ( $\chi^2[13] = 46.6, p < .01$ ). For example, Expert L2 is the most severe, while Expert T1 is the most lenient. However, the analysis of the local fit statistics revealed that all experts were self-consistent in their ratings, with L3 and W3 being the most misfitting experts.

Similarly, Table 2 shows that, although the expert groups differed in their overall severity ( $\chi^2[4] = 24.4, p < .01$ ), linguists, as a group, appear to be more severe, while writers, as a group, are more lenient, with educators, psychologists and teachers having similar leniency. The expert groups were consistent in their ratings, as indicated by the local fit statistics.

### 3.3. Item calibration and rankings

While the item reliability was high, experts showed considerable agreement, and no evidence for systematic bias. We further investigated group differences in the rankings of the factors by fitting separate two-facet (items and experts) models for each group. Different calibration values and orders of the items indicate that there were group differences in the ranking of the writing factors. Table 3 presents the calibration results of the MFRM for the items (expressed in logits) as a function of the group, as well as the rank given to each factor by each expert group.

As indicated in Table 3, the results show that, although some items were ranked similarly across groups (e.g., *penmanship* and *extrinsic motivation* were often ranked at the bottom of the list), there were also differences in the way each expert group scored the relative importance of some items. Linguists gave a high and similar importance to *generation of description*, *expressiveness*, and *narrative framing*. Teachers highlighted *observation*, *development of vocabulary*, *generation of description* and *elaboration* as key factors in the development of creative writing skills. This may reflect the skills that teachers tend to focus on and train when teaching writing. Writers attributed greater importance to *imagination*, *intrinsic motivation* and *integration/synthesis*, which probably reflects their personal experience with the act of writing. Similarly, museum art-educators underlined the importance of *imagination* and *perseverance*, as well as the visual aspect of *observation*, also

**Table 2**  
Model<sub>3</sub> calibration parameters for expert groups.

Expert group	Obs. avg.	Fair avg.	Measure (leniency)	SE	Infit	Outfit
Linguistics	4.56	4.87	$-0.53$	0.11	2.04	1.94
Museum educators	5.57	5.51	0.09	0.12	1.20	1.45
Psychologists	5.51	5.44	0.01	0.12	0.74	0.81
Teachers	5.60	5.50	0.08	0.12	1.10	1.11
Writers	6.00	5.76	0.35	0.13	1.47	1.50

Obs. avg. = observed average score; Fair avg. = fair average; Measure = logit measure of leniency; SE = standard error.



**Table 3**

Group-specific and overall logits scores (and ranks) of the writing factors (sorted by item type).

Item type	Expert group	L	M	P	T	W	All
	Item						
Creative cognition	01. Associative thinking	1.23 (9)	.03 (12)	.18 (10)	-.94 (25)	1.15 (8)	.15 (10)
	02. Divergent thinking	-1.37 (24)	.03 (12)	-.16 (19)	-.31 (17)	-.51 (20)	-.31 (20)
	03. Imagination	.26 (14)	<b>2.72 (1)</b>	.18 (10)	.05 (15)	<b>2.34 (2)</b>	<b>.80 (3)</b>
	04. Originality	-.85 (21)	-.32 (18)	.18 (10)	-1.24 (26)	-.51 (20)	-.45 (23)
	05. Selective combination	-1.65 (27)	.03 (12)	-.48 (20)	-.63 (20)	.38 (12)	-.38 (22)
	06. Concentration	.10 (16)	.26 (8)	.02 (14)	-.12 (16)	.22 (13)	.15 (10)
Executive function	07. Planning/Organization	1.97 (4)	-.80 (23)	.02 (14)	.29 (12)	.22 (13)	.15 (10)
	08. Working memory	-.67 (19)	-1.32 (26)	-.87 (25)	.88 (5)	-.20 (16)	-.53 (25)
General knowledge and cognition	09. Flexibility (cognitive)	-1.46 (25)	.85 (5)	.99 (4)	-.72 (22)	-.93 (23)	-.25 (19)
	10. Integration/Synthesis	.48 (13)	.34 (7)	.10 (12)	.88 (5)	<b>2.21 (3)</b>	.61 (6)
	11. Intelligence	-1.20 (23)	-.72 (22)	-.87 (25)	-.72 (22)	-.93 (23)	-.73 (26)
	12. Knowledge	.18 (15)	-.40 (19)	.99 (4)	-.39 (18)	-.20 (16)	-.02 (16)
	13. Inferencing	-.40 (18)	-.40 (19)	.10 (12)	.37 (11)	-.20 (16)	-.02 (16)
	14. Observation	1.55 (5)	<b>1.63 (3)</b>	.49 (6)	<b>1.66 (1)</b>	2.13 (4)	<b>1.39 (1)</b>
Linguistic and literary skills	15. Visualization as a process	.80 (10)	-.40 (19)	-.57 (24)	.88 (5)	-1.25 (25)	-.32 (21)
	16. Development of vocabulary	1.45 (6)	-10 (24)	-.11 (18)	<b>1.06 (2)</b>	1.41 (6)	.41 (8)
	17. Elaboration	1.45 (6)	.25 (9)	-.50 (21)	<b>1.06 (2)</b>	-.30 (19)	.49 (7)
	18. Generation of description	<b>3.18 (2)</b>	.25 (9)	.39 (7)	<b>1.06 (2)</b>	1.69 (5)	<b>1.18 (2)</b>
	19. Narrative framing	<b>3.09 (3)</b>	.25 (9)	-.50 (21)	.28 (13)	-1.85 (26)	.09 (14)
	20. Reading comprehension	1.45 (6)	-10 (24)	<b>2.09 (1)</b>	-1.32 (27)	.47 (9)	.09 (14)
Motivational and conative variables	21. Expressiveness	<b>3.22 (1)</b>	-.26 (17)	-.50 (21)	-.64 (21)	1.23 (7)	.23 (9)
	22. Extrinsic motivation	-.24 (17)	-1.45 (27)	-1.83 (28)	-1.45 (28)	-1.98 (28)	-1.64 (28)
	23. Intention	.64 (11)	-.25 (15)	.25 (8)	.12 (14)	.45 (10)	.14 (13)
	24. Intrinsic motivation	-.78 (20)	1.00 (4)	<b>1.92 (2)</b>	.52 (8)	<b>2.36 (1)</b>	.77 (4)
	25. Perseverance	.64 (11)	<b>1.78 (2)</b>	<b>1.15 (3)</b>	.52 (9)	-.05 (15)	.67 (5)
	26. Risk taking	-1.04 (22)	-.25 (15)	-.09 (16)	.52 (10)	.45 (10)	-.16 (18)
Psychomotor	27. Tolerance for ambiguity	-1.58 (26)	.50 (6)	-.09 (16)	-.87 (24)	-.78 (22)	-.51 (24)
	28. Penmanship	-2.34 (28)	-1.79 (28)	-1.30 (27)	-.39 (18)	-1.97 (27)	-1.41 (27)

L = linguists; M = museum educators; P = psychologists; T = teachers; W = writers; All = all groups together. Values in parentheses correspond to the ranks given to the item for each expert group. Values in bold correspond to the top three ranked items for each group.

emphasized by the teachers. Finally, psychologists stressed the role of *reading comprehension* as a fundamental factor for creative writing, as well as the important contributions of *intrinsic motivation* and *perseverance*.

As a single group, the experts from various disciplines gave primary emphasis to the importance of *generation of description*, *observation*, and *imagination* as major skills for creative writing. It should also be noted that, overall, most skills were evaluated as being important for creative writing except for the lowest rated factors (*penmanship* and *extrinsic motivation*), for which there was high agreement in the ranking across all experts-groups, suggesting the relative irrelevance of these factors for creative writing.

### 3.4. Global trends and domain specific perspective on the 28 factors

Table 4 shows that, overall, linguistic and literacy factors were pointed out as more important for creative writing across expert groups, whereas psychomotor factors were underemphasized. Other types of factors had an equivalent, average importance.

To investigate the measurement/ranking invariance across expert groups, we performed a DFF analysis examining the interaction (bias) between expert group and factor group facets. This interaction accounted for approximately 13% of the residual variance, and the omnibus test for the interaction was significant ( $\chi^2[30] = 60.00, p < .01$ ), indicating that there

**Table 4**Model<sub>3</sub> calibration parameters for item types.

Item type	Obs. avg.	Fair avg.	Measure (importance)	SE	Infit	Outfit
Creative cognition	5.27	5.51	0.09	0.12	1.13	1.03
Executive functions	5.77	5.67	0.25	0.20	1.07	1.02
General knowledge	5.44	5.59	0.17	0.10	1.16	1.09
Linguistic and literacy	6.27	6.10	0.78	0.14	2.21	2.21
Motivational/cognitive	5.21	5.44	0.02	0.11	1.29	1.31
Psychomotor	2.27	3.98	-1.31	0.26	1.30	1.14

Obs. avg. = observed average score; Fair avg. = fair average; Measure = logit measure of the item types importance; SE = standard error.

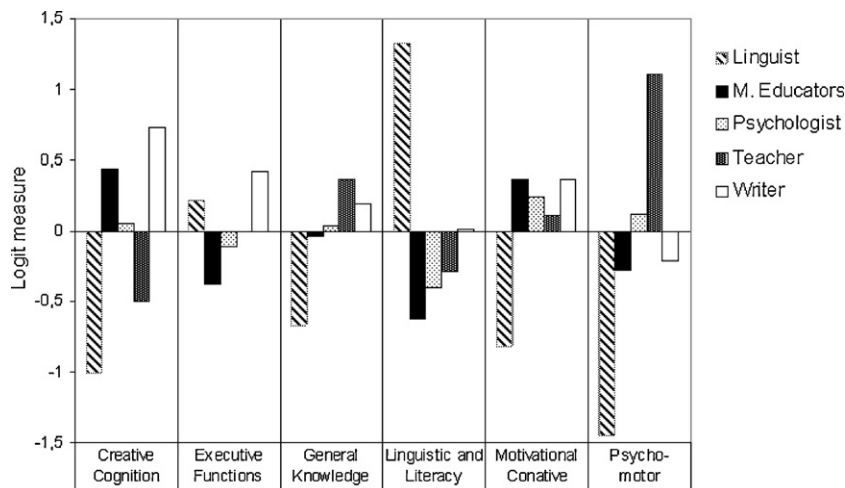


Fig. 2. Plots of the logits measure (estimates unadjusted for bias) for item-types, as a function of the expert group.

is a systematic bias in expert groups' rankings of items (i.e., writing factors) beyond measurement error. An examination of the bias indices revealed three significant bias terms: a negative bias for Creative Cognition by Teachers, (Bias =  $-.57$ ,  $t[14] = -2.26$ ,  $p < .05$ ), a positive bias for Linguistic and Literacy factors by Linguists (Bias =  $1.86$ ,  $t[17] = 4.38$ ,  $p < .001$ ), and a negative bias for Linguistic and Literacy factors by art-educators (Bias =  $-.71$ ,  $t[17] = -2.64$ ,  $p < .05$ ). In other words, these results suggest that, when adjusted for overall severity of ratings and factor parameters, linguists tend to overemphasize the importance of linguistic and literacy factors, whereas art-educators underemphasize these factors, and teachers underemphasize Creative Cognition factors. The bias estimates for items are plotted side by side in Fig. 2, showing estimates for each expert group with the inclusion of the bias term.

Fig. 2 clearly represents the global trends and domain specificities in the perception of creative writing skills. In particular, as compared to the others, Linguists strongly highlight the importance of Linguistic factors (e.g., *development of vocabulary*, *reading comprehension*, *narrative framing*), which makes sense given the training and interests of these experts. However, they tend to minimize the importance of the Psychomotor and the Creative Cognition factors. More than raters from other domains of expertise, Writers mainly underline the motivational and creative skills involved in creative writing. Again, this might reflect Writers' experience with the act of writing. Psychologist and Museum Art-educators tend to be more consensual, attributing average importance to all factor types. However, Psychologists emphasize more the linguistic and motivational aspects, whereas the Museum Art-educators stress more the role of creative cognition. Finally, teachers seem to have a very specific view of the factors involved in creative writing, placing more emphasis than the others on General knowledge and Cognition, and the Psychomotor factors, while significantly underemphasizing the Creative Cognition factors. It is likely that this particular view may reflect what Teachers have observed about children's writing in the course of instruction. Alternately, teachers who teach writing skills may find it difficult to teach children to be creative (Randi & Jarvin, 2006), and thus, they would less rely on skills related to creativity. Indeed, Teachers tend to be uncomfortable with ambiguity and risk, qualities associated with creativity (Cremin, 2006), thus they may be reluctant to teach creativity or may minimize its importance, particularly in the early stages of writing instruction.

### 3.5. Additional qualitative information

Experts made a few complementary comments at the end of the survey. In general, the factors they added were facets of one of the higher-order constructs already listed in the survey. For example, factors such as *writing fluency* (potentially a component of *elaboration*), or *making connections* (a result of *associative thinking* or *inferencing*), *reading* (related to *reading comprehension*) were cited. A few factors were also re-emphasized, such as *observation skills* (by one teacher and one writer), while two linguists pointed out the importance of grammar for creative writing, as the use of a variety of grammatical constructions allows maximum expressive effect. Although this might point to an important aspect of creative writing, it also fits with the linguists' tendency to emphasize literacy factors. Other raters suggested *revision* as an important process, also indicated in the first section of the present article (e.g., Zimmerman & Kitsantas, 2002), as well as *openness*, a personality trait often viewed as a facilitator of creative cognition in the creativity literature (e.g., McCraie, 1987). Finally, *empathy for the audience* was cited twice (and the ability to internalize the audience when writing) which could refer to the stage of knowledge-crafting where writers show an increased awareness of their audience (e.g., Kellogg, 2008), which re-emphasizes the possible role of this extrinsic motivator (Magnifico, 2010). Thus, while *penmanship* figures strongly in teachers' views of writing, likely because of its role in the early development of writing skills, *empathy for the audience* is decidedly a very specific skill that concerns mostly expert writers.

#### 4. Discussion

The present study highlighted different perspectives on the key factors that play a role in creative writing. Indeed, our results showed that, as a function of their specific domain of expertise, independent raters tend to emphasize the importance of different key components of creative writing, with consistent patterns of differences between domains. Beyond the expert groups' specific differences in perceiving the importance of these key factors (discussed below), we can still draw overall conclusions from this study. The global "consensus" across the expert groups indicated that creative writing skills are primarily supported by factors such as observation, generation of description, imagination, intrinsic motivation and perseverance, while the contributions of all of the other relevant factors seemed negligible (e.g., intelligence, working memory, extrinsic motivation and penmanship). Interestingly, most of the creative cognition factors were designated as among the least important factors, whereas imagination is ranked as a critical factor. Imagination has long been considered an important component of story making (Egan, 1989) as well as other forms of creative writing (Brill, 2004), and educators, psychologists and artists have often proposed connections between imagination and creative products (e.g., Egan, 1989; Eisner, 2003). In our study, it is possible that the relative contributions of some of the creative cognition factors were assessed as weaker because the terminology is too specific and possibly less well-known to experts not familiar with psychological theories of creativity. However, experts in this study readily identified more general dimensions, such as imagination, which may in fact represent a combination of these Creative Cognition factors.

Nonetheless, the global trends observed in this study appear useful to those interested in developing instructional programs to enhance creative imagination (Karwowski & Soszynski, 2008) and creative writing skills, ultimately as a means to enhance general writing skills. For example, incorporating factors such as observation in the writing curriculum appears to be relatively rare in practice, though potentially promising – as emphasized by creative Writers – and possible to implement in creative writing instruction. The relevance of observation for creative writing suggests that the ability to observe and capture elements from the environment may nurture mental imagery, the process by which writers recall or create a mental image of a setting, character, or event, and facilitate written description (e.g., Berninger et al., 1992; Coker, 2006; Juel, 1988), thereby improving the overall quality of writing (Sadoski et al., 1997) and its originality (Jampole et al., 1991). With respect to application, educational approaches such as museum–school partnership programs might constitute a relevant strategy to stimulate observational skills (e.g., Downey, Delamatre, & Jones, 2007) as a means to improving mental imagery, written description and imagination. Methods for incorporating visual arts into classroom literacy instruction might also be of benefit to this end (e.g., Danko-McGhee & Slutsky, 2007; Ehrenworth, 2003; Ernst, 1997; Mulcahey, 2009; Olsen, 1992; Olshansky, 1994), for example by emphasizing creative writing strategies that build upon drawing (Beghetto, 2008), or movie-making (Loveless, Burton, & Turvey, 2006).

Another factor that deserves particular attention for promoting creative writing is intrinsic motivation (consistently emphasized across expert groups and through the literature review), or task oriented-motivation (Larkin, 2009). The frequent identification of this factor by experts from different fields confirms that intrinsic motivation is an important parameter in improving writing skills (Tompkins, 2001). In the context of developing creative writing skills in children, it is relevant to trigger intrinsic motivation, for example, by giving children the opportunity to make choices about what they write within parameters set by the teacher (Tompkins, 2001). Indeed, children learn best when they have an immediate and permanent attachment to the topic, which is often increased when they choose it themselves (Coker, 2006; Kellogg, 2008; Tompkins, 2001).

As a final example, *imagination* is clearly an essential component of creative writing, which should be explicitly taught as an integral part of writing instruction (Jeffrey, 2006; Karwowski & Soszynski, 2008). Despite the apparent lack of emphasis on promoting imagination in school curricula, dispositions such as creativity and imagination can be cultivated in educational settings (e.g., Claxton, 2006; Claxton, Edwards, & Scale-Constantinou, 2006; Cremin & Barnes, 2010; Sefton-Green, Thomson, Jones, & Bresler, 2011). Although imagination is, on average, identified as essential, analyses at the domain-specific level revealed quite a different picture. Teachers tend to underemphasize this factor and other factors related to creative cognition. This may reflect actual teacher practices, as suggested by the considerable body of evidence showing that teachers' beliefs exert a powerful influence on classroom practices and student outcomes (Beghetto, 2008; Graham et al., 2002). However, there are many approaches to teaching writing and, beyond the differences identified across domains in the perceptions of creative writing, there are also varied beliefs about writing instruction among teachers (Graham et al., 2002). Nonetheless, the method used in this study allows us to see that teachers may undervalue *imagination* as a component of creative writing, while they overemphasize *penmanship* (relative to the other expert panels). This finding is consistent with Cutler and Graham's (2008) study indicating that a major use of writing programs appear to be the teaching of handwriting or spelling. Teachers' views and writing instructional practices may reflect a reluctance to teach "creativity."

#### 5. Study strengths and limitations, and future directions

Although the sample size in this study was small, the recruitment of highly trained, experienced individuals permitted an accurate understanding of domain-specific expert knowledge, as indicated by (a) the high inter-rater reliability coefficients obtained within each domain of expertise, and (b) the domain-specific systematic biases in factor ratings suggesting a strong consistency in the perspective on creative writing, according to each domain of expertise. In addition to this high level of expertise often associated with high accuracy and reliability of judgments (Hoffman et al., 1995), the

use of the Many-Facets Rasch Measurement (MFRM) model permitted us to overcome the limited sample size. Indeed, the sample-free assessment calibration achieved using the general probability theory to calibrate assessment results (as in MFRM) does not require a representative sample for its derivation (e.g., [Leung, Wang, & Lee, 2009](#)). This method allowed us to quantify the relative importance of these writing factors across domain-specific expertise, while controlling for expert severity and other systematic biases, resulting in domain-specific pictures of the “ingredients” involved in creative writing.

Others limitations of the present work should be pointed out. First, some of the domain-specific rankings observed might not refer only to “preferences” for a specific set of factors per se (e.g., as teachers tend to “prefer” psychomotor factors), but could reflect an emphasis on (a) a particular developmental period of creative writing that might be associated mainly with specific factors, (b) a particular type of creative writing work (e.g., story-writing, vs. writing poems) involving the factors differentially, or (c) different moments of the creative writing process that could involve each factor at distinct levels. For instance, it is possible that Teachers’ particular ways of scoring the factors might be related to the grade level at which they are used to teaching writing. As an illustration, [Beghetto \(2008\)](#) demonstrated that a significantly disproportionate number of prospective teachers designate the elementary grades – 1st grade in particular – as the time when students should be encouraged to focus more on memorizing facts as opposed to thinking imaginatively. By extension, experts from each sub-domain may have been driven in their judgments by the developmental level on which each domain typically focuses (e.g., as teachers might mainly focus on children, and writers mainly on adults).

On another note, even though we engaged in a thorough and careful selection of the candidate factors to be surveyed among experts – for example, we would argue that, based on the literature, the selected factors were important across developmental levels of writing – our picture of the “key ingredients” of creative writing is limited to the components we selected, and therefore, we may have excluded other relevant components. We were able to partially anticipate this issue by using the open-ending questions posed to the experts, and by doing so, were able to posit revision and empathy for the audience as additional key components (the latter being most probably relevant for expert writers).

Similarly, it is possible that at a micro-level, some ingredients of creative writing are not active throughout the creative process but only at specific stages (e.g., intention may be most important at the beginning of the process, while perseverance may be crucial later). Consequently, the group differences observed in rating the creative writing factors could reflect different conceptions of the creative writing process itself, in which each expert-group recognizes a particular stage as more important for the whole process. In this regard, it should be noted that the specificity and sequencing of the processes involved in creative writing, and the variation of these processes among individuals, are still uncertain ([Lubart, 2009](#)). While Cremin’s study on teachers’ personal experiences with creative writing (2006) illustrates a crucial similarity between early writers and adults – common experiences of uncertainty and discomfort with the ambiguity and risk-taking involved in creative writing – further complementary research could investigate how the relevant factors identified in this study may be situated in various stage of the creative writing process and within the development of individual as a writer.

This point brings us to a second line of interpretation of the results, and suggestions for future work. As the approach used in this study is a “componential” or “multivariate” perspective on creative writing, the results observed can be understood in light of general principles established in such approaches (e.g., [Sternberg & Lubart, 1995](#)). In particular, principles of thresholds, compensation, and “incremental” interaction should be considered. Regarding thresholds ([Sternberg & Lubart, 1995](#)) suggest that creativity involves more than a simple sum of a person’s attained level of functioning in each component: there may be thresholds for some components (e.g., knowledge) below which writing creatively is not possible, regardless of the levels of other components. Regarding “compensation,” partial compensation between components may occur, in which strength in one component (e.g., intrinsic motivation) counteracts a weakness in another component (e.g., divergent thinking). Regarding interaction, exponential effects resulting from the combinations of particular levels of specific components may also occur. Interaction could potentiate creativity. This principle may partly nuance the interpretation of our results since the presumably average or low importance of a factor may contribute to triggering creativity in specific configurations (i.e., in association with a particular level with another factor). The present study provided insights regarding these principles. For instance, it is likely that (a) a minimum level of the most important factors—as identified in this study (e.g., observation, intrinsic motivation) – is required for creative writing to occur; and (b) expert group differences observed in this study may possibly reflect “equivalence” between factors, which may explain the principle of compensation systems between components. Additionally, we might see these factors’ importance change historically, as learning environments, tools, and technology change the way we think, develop cognitively and write ([Willett, Robinson, & Marsh, 2008](#)). For example, penmanship may disappear as a relevant factor altogether one day, while blogging and texting may become primary venues for creative writing. These will undoubtedly soon become fruitful areas of research for creative writing. In view of developing creative-writing instruction based on the better integration of multiple domain-specific “expertise” in the skills involved, further research efforts could benefit from surveying the students themselves (cf. [Cheng, 2011](#)), or from empirical studies aiming to situate the contribution of each skill more directly, in a multivariate, interactive manner. Such alternative methodological approaches could strive, for example, to assess as many candidate creative-writing skills as possible in a sample of successful and unsuccessful writers (e.g., as assessed by several creative writing tasks) to determine the actual weight of the specific skills and the interactions (e.g., “optimal” combinations) between them.

## 6. Conclusion

Beyond the evidence of domain-specific expertise on the skills involved in creative writing, this study has contributed to a better understanding of the importance of several “key ingredients” (in particular, *observation, intrinsic motivation, imagination, description*) for the development of creative writing. Following principles of componential approaches of creativity, it is possible that individuals do not necessarily rely on all of these skills, and that they may draw on different skills depending on their developmental stage or writing purposes. Nonetheless, the different perspectives gathered here provide a more global view of creative writing that both teachers and writers could well use to enhance their own skills and practice. In addition, this broader understanding of creative writing through the identification of relevant contributing skills could serve as a foundation for the development of improved creative writing instruction for children, which could take the form of cognitive apprenticeship training programs (e.g., targeting relevant skills usually disregarded) that have proven effective in the development of writing skills in general (Kellogg, 2008).

## Acknowledgements

This study was part of a larger research/intervention project in partnership with the Yale Center for British Art. We would like to thank Cyra Levenson and Linda Friedlaender for their help in identifying the experts for this study. We are sincerely grateful to Sergey Kornilov for his contribution to the reported data analyses. We also thank Lisa Pavlova for her help in the survey design. We are very thankful to *Thinking Skills and Creativity*, its editor and the anonymous reviewers, for their thoughtful comments and suggestions. Finally, we would like to thank the experts involved in this work.

## Appendix A. Expert survey on factors of creative writing

### Factors that may be involved in creative writing.

Below is a list of factors we have identified as potentially important for the development of creative writing skills. Please rate these factors according to their relative importance to the development of good creative writing skills. From 1 (not important at all) to 7 (highly important).

1	2	3	4	5	6	7
not very important			somewhat important			highly important

- Development of vocabulary:

The process of learning new words, either through didactic instruction or through exposure to new words as they are presented in new contexts.

- Generation of description:

The process of using words, symbols, or pictures to capture and communicate information (about an object being observed).

- Observation:

The process of looking closely at something in its entirety, taking in both the details and the whole as an integrated entity.

- Making inferences from evidence:

The process of drawing logical conclusions from factual details.

- Selective combination:

The process of recombining the elements of a problem to change the representation of that problem.

- Divergent thinking:

The process of producing a broad range of responses or ideas to a given problem or stimulus.

- Associative thinking:

The process that brings together ideas that are different and often remote (not typically associated with one another), followed by an evaluation of the resulting synthesis for its appropriateness to the given context.

- Integration/synthesis:

The process of seeing a whole problem, with all of its various and diverse parts, and shaping and ordering these parts into a coherent resolution.

- Elaboration:

The process of generating details, such as when an artist adds one brushstroke after another or when a writer embellishes a plot with one detail after another.

- Narrative framing (logical sequence and story structure):

The process of building a coherent story that has characters, setting, and action in a structure that has a beginning, middle, and end.

- Working memory:

A complex system for temporarily storing and managing the information required to carry out complex cognitive tasks such as learning, reasoning, and comprehension.

- Concentration:

The act or process of focusing on something with close, undivided attention.

- Visualization as a process:



The process of creating a mental model or mental image from a verbal stimulus, either heard or read.

- Planning (in writing):

The process of searching for, organizing, and possibly even transforming knowledge as part of a strategic response to a specific writing task, its aims and context.

- Reading comprehension:

The process by which the new information obtained by reading is interpreted by the reader and becomes an integrated part of the reader's already established knowledge store or *schemata*; the interaction or incorporation of new information with old knowledge.

- Imagination:

The process by which we reproduce sensory and/or perceptual experiences stored in memory or recombine parts of formerly perceived experiences to create new arrangements that exist apart from any actual occurrence in reality.

- Intelligence:

The ability to perceive and comprehend meaning, to acquire and apply knowledge, to understand and profit from experience.

- Perseverance:

Steady persistence in adhering to a course of action, a belief, or a purpose, over a long period and especially despite difficulties or setbacks.

- Penmanship (fine motor skills):

The art or skill of handwriting or writing with a pen.

- Intrinsic motivation:

Motivation that comes from inside an individual rather than from any external or outside rewards, such as money or grades (comes without obvious external incentives), that comes from the pleasure one gets from the task itself or from the sense of satisfaction in completing or even working on a task.

- Extrinsic motivation:

Motivation that comes from outside an individual; that is, the motivating factors are external, or outside, rewards such as money or grades. These rewards provide satisfaction and pleasure that the task itself may not provide.

- Originality:

The quality of being new, interesting, and different from anything that anyone has created before.

- Intention:

A design, resolve, or determination of the mind. A course of action that one is set upon following.

- Knowledge:

Human faculty resulting from interpreted information; understanding that germinates from a combination of data, information, experience, and individual interpretation.

- Tolerance for ambiguity:

The ability to perceive, interpret, and react to ambiguous situations.

- Risk taking:

The tendency to engage in behaviors that have the potential to be harmful or dangerous, yet at the same time provide the opportunity for some kind of positive outcome.

- Flexibility (cognitive flexibility):

The ability to adapt cognitive processing strategies (the sequence of operations that search through a problem space) to face new and unexpected conditions in the environment.

- Expressiveness:

The quality of having the power or force of expression, of being able to present a subject strongly to the senses or to the mind.

## References

- Abbott, R., & Berninger, V. W. (1993). Structural equation modeling of relationships among developmental skills and writing skills in primary-grade and intermediate-grade writers. *Journal of Educational Psychology*, 85(3), 478–508.
- Amabile, T. M. (1982). Social psychology of creativity: A consensual assessment technique. *Journal of Personality and Social Psychology*, 43(5), 997–1013.
- Amabile, T. M. (1985). Motivation and creativity: Effects of motivational orientation on creative writers. *Journal of Personality and Social Psychology*, 48(2), 393–399.
- Baer, J., McKool, S., & Schreiner, C. S. (2009). Assessing creativity using the consensual assessment technique. In *Handbook of research on assessment technologies, methods, and applications in higher education*. Hershey, PA: IGI Global, pp. 65–77.
- Baker, S., Gersten, R., & Graham, S. (2003). Teaching expressive writing to students with learning disabilities: Research-based applications and examples. *Journal of Learning Disabilities*, 36, 109–123.
- Barron, F., & Harrington, D. M. (1981). Creativity, intelligence, and personality. *Annual Review of Psychology*, 32(1), 439–476.
- Beghetto, R. A. (2008). Prospective teachers' beliefs about imaginative thinking in K-12 schooling. *Thinking Skills and Creativity*, 3(2), 134–142. <http://dx.doi.org/10.1016/j.tsc.2008.06.001>
- Benoit, K., & Wisehomeier, N. (2009). Expert judgments. In S. Pickel, G. Pickel, H. Lauth, & D. Jahn (Eds.), *Methoden der vergleichenden politik – un sozialwissenschaft* (Methods of comparative politics and social science) (pp. 497–516). Wiesbaden, Germany: VS Verlag.
- Bereiter, C., & Scardamalia, M. (1987). *The psychology of written composition*. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Berninger, V. W., Cartwright, A., Yates, C., Swanson, L., & Abbott, R. (1992). Lower-level developmental skills in beginning writing. *Reading and Writing: An Interdisciplinary Journal*, 4(3), 258.
- Bland, J. (2011). *Finding the words: Writers on inspiration, desire, war, celebrity, exile, and breaking the rules*. Toronto, Canada: McClelland & Stewart.
- Bond, T., & Fox, C. (2007). *Applying the Rasch model* (2nd ed.). Mahwah, NJ: Lawrence Erlbaum Associates.
- Brill, F. (2004). Thinking outside the box: Imagination and empathy beyond story writing. *Literacy*, 38(2), 83–89. <http://dx.doi.org/10.1111/j.0034-0472.2004.03802004.x>
- Chen, S., & Zhou, J. (2010). Creative writing strategies of young children: Evidence from a study of Chinese emergent writing. *Thinking Skills and Creativity*, 5(3), 138–149.

- Claxton, G. (2006). Thinking at the edge: Developing soft creativity. *Cambridge Journal of Education*, 36(3), 351–362.
- Claxton, G., Edwards, L., & Scale-Constantinou, V. (2006). Cultivating creative mentalities: A framework for education. *Thinking Skills and Creativity*, 1, 57–61.
- Coker, D. (2006). Impact of first-grade factors on the growth and outcomes of urban schoolchildren's primary grade writing. *Journal of Educational Psychology*, 98(3), 471–473.
- Cremin, T. (2006). Creativity, uncertainty and discomfort: Teachers as writers. *Cambridge Journal of Education*, 36(3), 415–433.
- Cremin, T., & Barnes, J. (2010). Creativity in the curriculum. In J. Arthur, & T. Cremin (Eds.), *Learning to teach in the primary school* (pp. 357–373). Abingdon, UK: Routledge.
- Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika*, 16(3), 297–334.
- Cutler, L., & Graham, S. (2008). Primary grade writing instruction: A national survey. *Journal of Educational Psychology*, 100(4), 907–919.
- Danko-McGhee, K., & Slutsky, R. (2007). *The impact of early art experiences on literacy development*. National Art Education Association.
- de Jong, J., & Linacre, M. (1993). *Rasch estimation methods, statistical independence and global fit*. Retrieved on 21 January 2010 from <http://www.rasch.org/rmt/rmt72n.htm>
- Downey, S., Delamatre, J., & Jones, J. (2007). Measuring the impact of museum school programs: Findings and implications for practice. *Journal of Museum Education*, 32(2).
- Doyle, C. L. (1998). The writer tells: The creative process in the writing of literary fiction. *Creativity Research Journal*, 11(1), 29.
- Eckhoff, A., & Urbach, J. (2008). Understanding imaginative thinking during childhood: Sociocultural conceptions of creativity and imaginative thought. *Early Childhood Education Journal*, 36(2), 179–185.
- Egan, K. (1989). Memory, imagination, and learning: Connected by the story. *The Phi Delta Kappan*, 70(6), 455–459.
- Ehrenworth, M. (2003). *Looking to write: Students writing through the visual arts*. Heinemann.
- Eisner, E. (2003). The arts and the creation of mind. *Language Arts*, 80(5), 340–344.
- Ernst, K. (1997). Art goes to the classroom. *Teaching PreK-8*, 27(4), 64–65.
- Essex, C. (1996). Teaching creative writing in the elementary school. *ERIC Digest*, June 17, 2008.
- Flower, L. S., & Hayes, J. R. (1981). A cognitive process theory of writing. *College Composition and Communication*, 32, 365–387.
- Gallas, K. (1994). *The language of learning: How children talk, write, dance, draw and sing their understanding of the world*. New York: Teachers College Press.
- Golann, S. (1963). Psychological study of creativity. *Psychological Bulletin*, 60(6), 548–565.
- Gardner, J. (1991). *The art of fiction: Notes on craft for young writers*. NY: Vintage Books.
- Graham, S., & Harris, K. R. (2000). The role of self-regulation and transcription skills in writing and writing development. *Educational Psychologist*, 35, 3–12.
- Graham, S., Harris, K. R., MacArthur, C., & Fink, B. (2002). Primary grade teachers' theoretical orientations concerning writing instruction: Construct validation and a nationwide survey. *Contemporary Educational Psychology*, 27(2), 147–166.
- Graham, S., & Perin, D. (2007). *Writing next: Effective strategies to improve writing of adolescents in middle and high school*. Washington, DC: Alliance for Excellent Education.
- Guilford, J. P. (1967). *The nature of human intelligence*. New York, NY: McGraw-Hill.
- Guilford, J. P. (1977). *Way beyond the I.Q.* Buffalo, NY: Creative Education.
- Harris, K. R., Graham, S., & Mason, L. (2006). Improving the writing, knowledge, and motivation of struggling young writers; Effects of self-regulated strategy development with and without peer support. *American Educational Research Journal*, 43, 295–340.
- Hayes, J. R., & Flower, L. S. (1980). Identifying the organization of writing processes. In L. W. Gregg, & E. R. Steinberg (Eds.), *Cognitive processes in writing*. Hillsdale, NJ: Erlbaum.
- Hayes, J. R., & Flower, L. S. (1986). Writing research and the writer. *American Psychologist*, 41(10).
- Hennessy, B. A., & Amabile, T. M. (2010). *Creativity Annual Review of Psychology*, 61, 569–598.
- Hirsch, E. D., Jr. (1987). *Cultural literacy: What every American needs to know*. Boston: Houghton Mifflin.
- Hoffman, R. R., Shadbolt, N. R., Burton, A. M., & Klein, G. (1995). Eliciting knowledge from experts: A methodological analysis. *Organizational Behavior and Human Decision Processes*, 62(2), 129–158.
- Jampole, E. S., Konopak, B. C., Readence, J. E., & Moser, E. B. (1991). Using mental imagery to enhance gifted elementary students' creative writing. *Reading Psychology*, 12, 183–197.
- Jeffrey, B. (2006). Creative teaching and learning: Towards a common discourse and practice. *Cambridge Journal of Education*, 36(3), 399–414.
- Juel, C. (1988). Learning to read and write: A longitudinal study of 54 children from first through fourth grades. *Journal of Educational Psychology*, 80(4), 437–447.
- Karwowski, M., & Soszynski, M. (2008). How to develop creative imagination? Assumptions, aims and effectiveness of role play training in creativity. *Thinking Skills and Creativity*, 3, 163–171.
- Kellogg, R. T. (2008). Training writing skills: A cognitive developmental perspective. *Journal of Writing Research*, 1(1), 1–26.
- Kennedy, R. (July 2006). Guggenheim study suggests arts education benefits literacy skills. *The New York Times*.
- Landeta, J. (2006). Current validity of the delphi method in social sciences. *Technological Forecasting and Social Change*, 73(5), 467–482.
- Larkin, S. (2009). Socially mediated metacognition and learning to write. *Thinking Skills and Creativity*, 4(3), 149–159.
- Leung, C., Wang, Y., & Lee, A. (2009). Assessment of undergraduate students' music compositions. *International Journal of Music Education*, 27, 250–268.
- Linacre, M. (1994). *Many-facet Rasch measurement*. Chicago: MESA Press.
- Linacre, M. (2009). *Facets Rasch measurement computer program manual (version 3.65.0)*. Chicago, IL: Winsteps.com.
- Long, S., Hiebert, E. H., Nules, J. A., & Lalik, R. (1985). Effects of awareness and practice in mental imagery on creative writing of gifted children. *Thirty-fourth yearbook of the national reading conference* (pp. 381–385). Rochester, NY: National Reading Conference.
- Loveless, A., Burton, J., & Turvey, K. (2006). Developing conceptual frameworks for creativity, ICT and teacher education. *Thinking Skills and Creativity*, 1, 3–13.
- Lubart, T. I. (2009). In search of the writer's creative process. In S. B. Kaufman, & J. C. Kaufman (Eds.), *The psychology of creative writing* (pp. 149–165). New York: Cambridge University Press.
- Lynn, M. R. (1986). Determination and quantification of content validity. *Nursing Research*, 35(6), 382–386.
- Magnifico, A. M. (2010). Writing for whom? Cognition, motivation, and a writer's audience. *Educational Psychologist*, 45(3), 167–184.
- McCrae, R. R. (1987). Creativity, divergent thinking, and openness to experience. *Journal of Personality and Social Psychology*, 52(6), 1258–1265.
- McCutcheon, D. (1986). Domain knowledge and linguistic knowledge in developing writing ability. *Journal of Memory and Language*, 25.
- McCutcheon, D. (2006). Cognitive factors in the development of children's writing. In C. A. MacArthur, S. Graham, & J. Fitzgerald (Eds.), *Handbook of writing research* (pp. 115–130). New York: The Guilford Press.
- McKeough, A., Palmer, J., Jarvey, M., & Bird, S. (2007). Best narrative writing practices when teaching from a developmental framework. In S. Graham, C. MacArthur, & J. Fitzgerald (Eds.), *Best practices in writing instruction* (pp. 50–71). New York, NY: The Guilford Press.
- Mednick, S. (1962). The associative basis of the creative process. *Psychological Review*, 69(3), 220–232.
- Meecham, P. (2002). *Picturing relationships: Working with words and pictures in the gallery*. Book Art. Summer 2002.
- Mulcahey, C. (2009). *The story in the picture: Inquiry and artmaking with young children*. New York: Teachers College Press.
- Nettle, D. (2009). The evolution of creative writing. In S. B. Kaufman, & J. C. Kaufman (Eds.), *The psychology of creative writing* (pp. 101–116). New York: Cambridge University Press.
- Newell, G. E. (2006). Writing to learn: How alternative theories of school writing account for student performance. In C. A. MacArthur, S. Graham, & J. Fitzgerald (Eds.), *Handbook of writing research* (pp. 235–247). New York: The Guilford Press.
- Olsen, E., & Schaeffer, G. (2011). *We wanted to be writers: Life, love, and literature at the Iowa Writers' Workshop*. New York: Skyhorse Publishing.

- Olsen, J. (1992). *Envisioning writing: Toward an integration of drawing and writing*. Heinemann.
- Olshansky, B. (1994). Image-making within the writing process. *Language Arts*, 71, 350–356.
- Pack, R., & Parini, J. (Eds.). (1991). *Writers on writing*. Hanover, NH: Middlebury College Press.
- Perry, S. K. (2005). Flow and the art of fiction. In J. C. Kaufman, & J. Baer (Eds.), *Creativity across domains: Faces of the muse* (pp. 23–40). Mahwah, NJ: Lawrence Erlbaum Associates.
- Perry, S. K. (2009). *Writing in flow*. New York: Cambridge University Press.
- PolICASTRO, E., & Gardner, H. (1999). From case studies to robust generalizations: An approach to the study of creativity. In R. J. Sternberg (Ed.), *Handbook of creativity* (pp. 213–225). Cambridge: Cambridge University Press.
- Polit, D. F., & Beck, C. T. (2006). The content validity index: Are you sure you know what's being reported? Critique and recommendations. *Research in Nursing and Health*, 29(5), 489–497.
- Pretz, J. E., Naples, A. J., & Sternberg, R. J. (2003). Recognizing, defining, and representing problems. In J. E. Davidson, & R. J. Sternberg (Eds.), *The psychology of problem solving* (pp. 3–30). New York: Cambridge University Press.
- Randi, J., & Jarvin, L. (2006). An A for creativity: Assessing creativity in language arts. *The Thinking Classroom*, 7(4), 26–32.
- Roberts, J., Mitchell, B., & Zubrinich, R. (2002). *Writers on writing*. Victoria, Australia: Penguin Books.
- Root, R., & Steinberg, M. (1999). *The fourth genre: Contemporary writers on creative nonfiction*. Boston: Allyn & Bacon.
- Rubio, D. M., Berg-Weger, M., Tebb, S. S., Lee, E. S., & Rauch, S. (2003). Objectifying content validity: Conducting a content validity study in social work research. *Social Work Research*, 27(2), 94–104.
- Runco, M. A. (2009). Writing as an interaction with ideas. In S. B. Kaufman, & J. C. Kaufman (Eds.), *The psychology of creative writing* (pp. 180–195). New York: Cambridge University Press.
- Sadoski, M., Kealy, W. A., Goetz, E. T., & Paivio, A. (1997). Concreteness and imagery effects in the written composition of definitions. *Journal of Educational Psychology*, 89(3), 518–526.
- Sefton-Green, J., Thomson, P., Jones, K., & Bresler, L. (Eds.). (2011). *The Routledge international handbook of creative learning*. Abingdon, UK: Routledge.
- Shanahan, T. (2006). Relations among oral language, reading, and writing development. In C. A. MacArthur, S. Graham, & J. Fitzgerald (Eds.), *Handbook of writing research* (pp. 171–183). New York: Guilford Press.
- Shanteau, J. (1992). The psychology of experts: An alternative view. In G. Wright, & F. Bolger (Eds.), *Expertise and decision support*. New York: Plenum Press.
- Sharples, M. (1996). An account of writing as creative design. In C. M. Levy, & S. Ransdell (Eds.), *The science of writing: Theories, methods, individual differences, and applications* (pp. 127–148). Mahwah, NJ: Lawrence Erlbaum Associates.
- Shatil, E., Share, D. C., & Levin, I. (2000). On the contribution of kindergarten writing to grade one literacy: A longitudinal study in Hebrew. *Applied Psycholinguistics*, 21, 1–21.
- Stein, N. L. (1986). Knowledge and process in the acquisition of writing skills. *Review of Research in Education*, 13(1), 255–258.
- Sternberg, R. J. (2000). Identifying and developing creative giftedness. *Roeper Review*, 23(2).
- Sternberg, R. J., & Lubart, T. I. (1995). *Defying the crowd: Cultivating creativity in a culture of conformity*. New York, NY: Free Press.
- Sternberg, R. J., Kaufman, S. B., & Kaufman, J. C. (2009). Foreword. In *The psychology of creative writing*. New York, NY: Cambridge University Press. (pp. xv–xvii).
- Tan, M., Randi, J., Barbot, B., Levenson, C., Friedlaender, L. K., & Grigorenko, E. L. (2012). Seeing, connecting, writing: Developing creativity and narrative writing in children. In E. L. Grigorenko, E. Mambrino, & D. Preiss (Eds.), *Writing: A mosaic of new perspectives* (pp. 275–291). New York: Psychology Press.
- Tompkins, G. E. (1982). Seven reasons why children should write stories. *Language Arts*, 59(7), 718–721.
- Tompkins, G. E. (2001). *Literacy for the 21st century*. Upper Saddle River, NJ: Prentice Hall.
- Torrance, M., & Galbraith, D. (2006). The processing demands of writing. In C. A. MacArthur, S. Graham, & J. Fitzgerald (Eds.), *Handbook of writing research* (pp. 67–80). New York: The Guilford Press.
- Treffinger, D. J. (2009). Myth 5: Creativity is too difficult to measure. *Gifted Child Quarterly*, 53, 245–247.
- Tucha, O., Trumpp, C., & Lange, K. W. (2004). Limitations of the dual-process-theory regarding the writing of words and non-words to dictation. *Brain and language*, 91(3), 267–273.
- Urban, K. K., Ambrose, D., Cohen, L. M., & Tannenbaum, A. J. (2003). Toward a componential model of creativity. In *Creative intelligence: Toward theoretic integration*. Cresskill, NJ: Hampton Press Inc.
- Ward, T., Smith, S. M., & Fink, R. A. (1999). Creative cognition. In R. J. Sternberg (Ed.), *Handbook of creativity* (pp. 189–212). Cambridge: Cambridge University Press.
- Willett, R., Robinson, M., & Marsh, J. (2008). *Play, creativity and digital cultures*. London: Routledge.
- Zenasni, F., Besancon, M., & Lubart, T. I. (2008). Creativity and tolerance of ambiguity: An empirical study. *Journal of Creative Behavior*, 42(1), 61–73.
- Zhu, W., Ennis, C. D., & Chen, A. (1998). Many-faceted Rasch modeling expert judgment in test development. *Measurement in Physical Education and Exercise Science*, 2(1), 21–39.
- Zimmerman, B. J., & Kitsantas, A. (2002). Acquiring writing revision and self-regulatory skill through observation and emulation. *Journal of Educational Psychology*, 94, 660–668.
- Zimmerman, B. J., & Risemberg, R. (1997). Becoming a self-regulated writer: A social cognitive perspective. *Contemporary Educational Psychology*, 22, 73–101.