

Why and how do creative thinking techniques work?: Trading off originality and appropriateness to make more creative advertising

Mark Kilgour · Scott Koslow

Received: 16 June 2008 / Accepted: 22 January 2009 / Published online: 19 February 2009
© Academy of Marketing Science 2009

Abstract The research examines the effects of divergent and convergent creative thinking techniques on creative ideation processes. To analyze these effects an experiment is undertaken on advertising creatives, account executives, and students. Results demonstrate that divergent thinking techniques improve the idea originality of account executives, but not creatives. Alternatively, creatives produce more appropriate ideas by using convergent thinking techniques, yet account executive performance is clearly harmed by them. Few effects are seen on the student control group, who lack both knowledge of techniques and the domain. The findings suggest that creativity techniques are not a one-size-fits-all proposition but need to be tailored to the person and the situation in which they are applied. Implications for researchers and marketing managers are discussed.

Keywords Creativity · Creative thinking techniques · Divergent and convergent thinking · Advertising

Creativity in marketing is widely viewed as a way to solve complex problems for the benefit of firms (Goldenberg and Mazursky 2002). Given creativity's importance marketers have applied two general approaches to enhancing it. The first focuses on how the social environment can be influenced to enhance creativity (Amabile 1996; Koslow et al. 2006; Kover and Goldberg 1995; Sutherland et al. 2004; West 1999; West and Ford 2001). The second uses creative

thinking techniques to develop superior ideas (Clapham 1997; Goldenberg et al. 1999; Lemons 2005; Osborn 1953).

With the social environment approach there are both costs and benefits that mean firms do not always select the creative path (West 1999; Koslow et al. 2006). In contrast, the use of creativity techniques is frequently thought of as a proverbial “free lunch” such that they produce significant gains and few costs beyond the effort of learning the technique. Despite the widespread faith in creativity techniques, their empirical record remains inconsistent (Nickerson 1999), and their use in industry is limited. Thus, we address a key puzzle: if these techniques provide such strong net benefits, why aren't they used more?

This research argues that applying the techniques involves making trade-offs between creativity's two main components. As Runco and Charles (1992) propose, a creative idea is both original and appropriate, and Koslow et al. (2003) show that in a marketing situation, appropriateness refers to how on-strategy an idea is. Splitting creativity into its components is vital because most creativity techniques encourage divergent, or original, thinking rather than convergent, or appropriate, thinking. If originality and appropriateness do trade-off, then using an overall measure masks these subtle effects.

We argue that while traditional creativity techniques allow some people to think more divergently, they come at a cost to appropriateness. Hence only those with a high level of knowledge specific to the domain in which they are to create, yet lacking divergent thinking skills, benefit. Thus, we depart from current research which assumes universal benefits.

We also suggest that those with strong divergent thinking skills but limited domain knowledge can be helped by a different kind of technique. Whereas most creativity techniques focus on divergent thinking, another approach is

M. Kilgour · S. Koslow (✉)
Department of Marketing, Waikato Management School,
University of Waikato,
Private Bag 3105,
Hamilton, New Zealand
e-mail: skoslow@mngt.waikato.ac.nz

to increase convergent thinking by priming participants to critical knowledge domains (Marsh et al. 1999; Smith et al. 1993). While these techniques reduce originality, they improve appropriateness.

We further address one final issue: the differences between student and professional samples (see West et al. 2008). With only a few exceptions (e.g., Johar et al. 2001) creativity researchers have focused almost exclusively on student samples. We show that empirical results from a general population sample, like students, generalize poorly to advertising professionals—and for good reason. Each group brings to the creative thinking process different kinds of abilities and knowledge that need to be taken into account in order to identify the creative thinking techniques that are most useful to them.

Theory

If the ultimate aim of creativity research is to determine how individual creativity can be enhanced, one must start with a definition of creativity. Over 50 years after Guilford (1950) re-energized research into creativity there is now widespread agreement on what constitutes a creative idea. For an idea to be considered creative it must be both original and appropriate (Amabile 1996; Ford 1996; Kasof 1995; Mumford and Simonton 1997; Runco 2004). This combination is evident in the advertising literature (Reid et al. 1998), new product development (Moorman and Miner 1997; Sethi et al. 2001), and the definition used by advertising personnel (Koslow et al. 2003).

Organizations are constantly searching for original and appropriate solutions to problems, and as individuals are the originators of creative ideas, a key question is whether individual creativity can be enhanced? To address this question requires an understanding of the individual thought processes that result in creative ideas. Coney and Serna (1995) conclude that the creative thinking process involves merging disparate mental elements to produce an original and appropriate solution. Mumford et al. (1997b) found the ability to combine and reorganize memories is related to individual creative success. Hence, research into the creative thinking process has focused on the generation, syntheses, and modification of ideas (Engle et al. 1997; Mumford et al. 1997a).

While many different terms have been used to describe creative thinking processes they all correspond to the concepts of divergent and convergent thinking (Guilford 1968). Divergent thinking involves opening unusual memory categories to use as the basis for idea development. Convergent thinking involves the reorganization and integration of ideas within a domain to make a coherent whole (Mumford et al. 1997a).

Creativity techniques vary depending on the extent that they encourage divergent or convergent processes, although most are focused on divergent thinking. Divergent thinking techniques facilitate the connection of previously unrelated memory nodes; in other words they encourage the association of distant domains. Convergent techniques focus a respondent on the problem domain and encourage new connections between ideas within that domain.

Creativity via divergent thinking techniques

Practitioners have looked at enhancing the process of creative thinking using divergent techniques that prime unusual concepts to be used in the idea generation process (de Bono 1968). An early example, called *Synerics* (Gordon 1961), encourages the combination of distantly associated ideas by forcing respondents to combine ideas from different domains. It is these ideation skills that are the focus of measurement in tests of creativity (Clapham 1997).

These techniques encourage associative processes that prime non-domain information to be used in the creative combination process. Interviews with advertising creative personal indicates they use a variety of self taught internalized associative techniques to assist in their idea generation processes (Kilgour 2008). Creativity techniques, such as word associations or the use of metaphors, prime distant concepts and force a respondent to think across domains to come up with more original solutions (Baughman and Mumford 1995; McFadzean 2000).

These practitioner approaches to creative idea generation treat it as an inherent ability that can be enhanced by using divergent thinking techniques. Goldenberg et al. (1999) support this practitioner contention and advocate finding problem analogues to develop ideas using a technique they call *Templates*. Further support for the trainability of creative thinking techniques is found in a review of the effectiveness of creativity training by Scott et al. (2004b).

Despite the contention that these techniques can be easily taught, there is only limited research on and understanding of 1) the processes that underlie their success or failure, 2) how techniques may differ, and 3) whom these techniques may benefit. One concept that provides insight into how associative training strategies differ and how they work is Schilling's (2005) associationist, or network view, of memory.

Making links between distantly associated ideas is referred to by Schilling (2005) as insight. This can happen in problem solving as unexpected connections are made between concepts. She notes that these connections come by 1) completing a schema, 2) reorganizing information, 3) overcoming a mental block, 4) finding a problem analogue, or 5) random recombination. However, the process of reorganizing information is very different from that of

random recombination. The former focuses on new combinations of information within a domain (convergent thinking) and the latter on combining different domains of thought (divergent thinking). The random recombination strategy can be directly related to creative thinking priming techniques used by practitioners such as *Synetics*, *Templates*, or using other unusual metaphors. These divergence techniques force a deliberate interjection of a more distant domain concept in the idea generation process in order to generate more original ideas.

Although the literature shows that divergent thinking techniques have a positive effect on originality, issues persist as to whom these techniques may assist. Although Scott et al.'s (2004b) meta-analysis shows creativity training improves respondent performance, only three out of 70 studies have examined the effectiveness of creativity training on non-student samples. Another concern is that the measures used to assess creative thinking techniques emphasize originality or novelty, frequently ignoring problem solving and performance criteria associated with the appropriateness facet of creativity (Scott et al. 2004b). Given processing limitations it would be expected that these techniques would increase originality but come at the trade off cost to appropriateness.

H1: For novices, a divergent thinking technique improves the originality of their ideas, but decreases appropriateness.

Creativity via domain specific knowledge

Focusing on more original thought is only one of two strategies for developing creative ideas. The second focuses on improving appropriateness through convergent thinking. Using Schilling's (2005) framework, this could come about by completing a schema or reorganizing information. Wallas (1926), Osborn (1953), Young (1960) and Stewart et al. (2008) have all developed processes that formalize this reorganization process and encourage respondents to look within a domain of knowledge for missing links.

However, focusing a respondent on their existing knowledge structures has shown varied effects in relation to creative ideation. Although many researchers assert that domain knowledge is a critical antecedent to creative thinking (Amabile 1983; 1988; Briskman 1980; Frensch and Sternberg 1989; Simon 1986; Simonton 2003), other cognitive science researchers have found that priming a person's knowledge can limit their ability to generate creative ideas (Adelson 1984; Ward 1994; Wiley 1998).

So how much knowledge is too much knowledge when it comes to creative thinking? The predominant view is that prior knowledge is needed, but not sufficient, for creative cognition. Knowledge is not enough as it must be used in unconventional ways to produce insight (Smith et al. 1995).

There is significant research into domain knowledge effects using relative domain novices that has shown that if respondents are primed with examples they use them in their creative ideation processes even when explicitly instructed not to (Marsh et al. 1999; Smith et al. 1993; Ward 1994). These results are consistent with what Ward (1994) refers to as structured imagination, where similar structures underlie creative and non-creative aspects of cognition. If information is primed there is a significant tendency to use the related domain as the basis for creative ideation processes (Smith et al. 1993), leading to a strong conformity effect and decreased originality.

In relation to appropriateness, priming a novice will lead to them opening domain category information that, while relatively undeveloped, will be more appropriate than the alternative category they would otherwise have opened. This domain category will then act as a facilitating example, providing them with more appropriate cues to use in their creative ideation processes than they may otherwise have used (Marsh et al. 1996).

H2: For novices, a convergent thinking technique improves the appropriateness of their ideas, but reduces originality.

Domain specific knowledge and creative thinking techniques

While knowledge may allow for better idea refinement once a creative idea has been developed, it appears to limit that expert's ability to come up with the original idea in the first place. This is because the more associations are reinforced over time the more efficient the retrieval process of expert individuals. This efficient retrieval process may lead to functional fixedness where an individual automatically recalls a representation and has difficulty in doing otherwise (Ford 1996; Marsh et al. 1996; Schilling 2005; Wiley 1998).

Wiley (1998) discusses this problem using the phrase 'expertise as mental set'. She shows that when provided with misleading problems experts perform worse than novices due to an early commitment by experts to a solution path. Experts' highly efficient knowledge structures result in efficient retrieval processes that lead to solution paths, but limited mental search space. The strong influence of primed information in creative idea generation tasks indicates that those examples act to trigger domain specific knowledge that then acts as mental sets, limiting the search space of respondents (Hecht and Proffitt 1995).

Not only is originality reduced for the expert when using a convergent thinking technique, the appropriateness of ideas may suffer as well as it is likely a convergent prime would lead to the opening of less appropriate memory categories than those otherwise opened by the expert. As

experts have many more domain category memories that may compete for cognition in the retrieval process, if a convergent prime suggests a memory category that is not the best category, experts will focus too narrowly and their functional fixedness may not allow them to move to related memory categories that would be more appropriate. This was highlighted in the research by Hecht and Proffitt (1995) whereby experts' early commitment to a less appropriate search space limited their ability to develop a more appropriate solution.

H3: For domain experts, a convergent thinking technique reduces both the originality and appropriateness of ideas.

The effect of divergent thinking techniques on domain experts has received little research attention. Most studies have focused on everyday creativity using tasks that require only average levels of expertise so as to be appropriate for student samples (Smith et al. 1995). Despite this, research on eminent creative individuals has provided some insights into the potential effects of divergent thinking techniques that encourage cross domain combination processes (Guilford 1968; Simonton 2003).

In studies of eminent creative individuals Simonton (2003) found that random combinations have been credited with many major scientific breakthroughs. While divergent thinking might result from the opening of existing, yet unusual, internal memory categories, it can also be triggered through random environmental information. Environmental factors might account for the assertion that "... creative behaviour in science demands the intrusion of a restricted amount of chance, randomness, or unpredictability" (Simonton 2003, p. 476).

Likewise when experts use divergent thinking techniques that take them away from their normal stringent search space, more original solutions should result. Divergent thinking primes that focus them on distant domain should act to increase originality but at a cost to their appropriateness. A person with strong knowledge of appropriate solutions, if given sufficient time, should be able to make these initially original ideas more appropriate. However, under timed conditions processing limitations will mean an increase in originality will come with a modest trade-off cost to appropriateness.

H4: For domain experts, a divergent thinking technique increases the originality of ideas, but reduces appropriateness.

Associative thinking abilities and creative thinking techniques

Another major issue relating to the creative idea generation processes is that some people are better able to make connections between distant domains of knowledge.

El-Murad and West (2004) state that the three primary creativity theories all contend that individual associative abilities are central to creative ability. Mednick (1962) proposed that some people have a flatter associative hierarchy. This means that when given a concept they can relate that concept to a wider range of other concepts than a person with a steep associative hierarchy.

As noted by Scott et al. (2004a), the weight of evidence points toward the importance of an individual's combination abilities in their creative success, and Simonton (2003) notes that priming effects will be moderated by the extent to which spreading occurs due to differences in associative hierarchies. Unlike domain knowledge, which is domain specific, creative associative abilities are contended to be cognitive styles or inherent abilities that can be applied across domains (Kirton 1976; Martinsen 1995; Mednick 1962; Torrance 1974). These differences in associative ability may explain why divergent thinking techniques are not widely applied in the creative industries.

In relation to divergent thinking techniques, given the abundance of research showing that they improve individual originality it may appear surprising that they are not widely applied by people in the creative industries, (see Csikszentmihalyi 1996; Dewey et al. 1998; Doyle 1998; Griffin 2008). In fact, Sasser and Koslow (2008) note professional creatives view divergent techniques as a crutch for creatives of lesser ability. The internalization of these processes and differences in individual associative abilities would explain this lack of industry application. If, as would be expected, people with high associative abilities, such as advertising creatives, have little to gain from external divergent thinking techniques then they would not use them, and look down on those who do. The fact that the development of creative cognition theory has been based predominantly upon student samples rather than industry groups would explain this lack of industry application.

Another issue with divergent thinking techniques is that for people of high associative ability the techniques not only do little in terms of improving their originality but will also result in reductions in appropriateness, depending upon the level of domain specific knowledge. Although those high in associative thinking abilities may not be high in domain knowledge, they are still often at least moderate in knowledge of the domain in which they work. For example, advertising creatives may use their associative abilities primarily, but they still have some expertise about advertising strategy and effectiveness. Similar to other experts, the effortful distraction of using random divergent techniques may crowd out appropriateness.

H5: For those of high associative ability and moderate domain knowledge, a divergent thinking technique reduces originality and appropriateness.

Because most empirical research on convergent thinking techniques does not address those with high associative ability, it is unclear what effects the techniques have on this group, but there is reason to be optimistic. Unlike divergent thinking techniques, there is more uniform praise for convergent thinking among creatives (Osborn 1953; Rossiter 2008; Stewart et al. 2008; Young 1960), as for why they work, less has been researched.

It may be that convergent thinking techniques work on those of high associate ability similarly to domain novices, focusing them on relevant domain information, but with only a relatively marginal reduction in originality, as baseline levels of originality are already high. For those with strong associative abilities, convergent thinking primes that focus them on the domain should act to provide information that makes them think about more appropriate connections. A person with strong abilities to think across domains will have little difficulty in developing original ideas so providing convergent thinking techniques should result in an increase in their focus on appropriateness issues at limited cost to their originality.

H6: For those high in associative ability and moderate domain knowledge, a convergent thinking technique improves appropriateness, but reduces originality.

Examining expertise and associative ability: Students versus advertising professionals

To test these hypotheses requires sample groups with variations in both domain specific knowledge and divergent thinking abilities. The advertising industry was chosen as it employs two groups with high levels of specialist abilities: 1) creatives, employed primarily for their ability to develop novel ideas using divergent thinking and associative abilities (McGann 1986) and, 2) account executives who focus on marketing strategy issues involving client strategy and target markets (appropriateness knowledge) (Koslow et al. 2006). Undergraduate students were used as the novice group given their limited knowledge of the advertising domain relative to agency personnel, and their lack of knowledge of divergent thinking techniques. Advertising ideas also meet the commonly held academic definition of creativity—originality and appropriateness—so was used as the basis for measurement. In order to test the hypothesis a 2 by 2 experimental design was used.

An account executives' job scope involves undertaking extensive research and understanding and measuring the appropriateness and resultant effects of their client's campaigns. This results in strong knowledge of the advertising appropriateness criteria of the domain. It is acknowledged that appropriateness is a subjective criterion dependent upon the audience, but that there are strong

similarities in judgments within group (Koslow et al. 2003). The appropriateness measures used therefore focus on advertising on-strategy measures in which account executives have strong domain specific knowledge.

While through their work account executives may have had some exposure to divergent thinking techniques, they do not have the same level of creative abilities as creative personnel. Creatives possess strong skills in developing creative ideas and are used as the group with high associative abilities (Amabile 1996). Agency creative staff are in a unique position of having a job that focuses them on developing creative ideas. While their time in the industry has led to knowledge of the advertising domain they are focused primarily on ideation tasks. Hence they have very strong associative abilities and a moderate knowledge of the appropriateness criterion. Students lack both creative skills and advertising knowledge. Undergraduate students are predominantly young adults with limited work experience or exposure to either the advertising industry or creativity techniques.

Method

A 2×2 experiment manipulated the use of a convergent thinking technique and a divergent thinking technique. Half the participants received a convergent thinking prime, and half received a random word divergent technique. The study involved 49 creatives, 65 account executives and 44 students, for an average of just under 40 subjects per cell. Each subject designed three creative campaigns for a hypothetical brand of household insecticide.

Sample Industry participants came from two advertising agencies, both major agency brands and recent recipients of "Agency of the Year" awards. The majority of the responses came from New York City, but also from a Pacific Coast regional office of each agency. The students were all native English speakers and came from a medium sized, public university on the Pacific Coast. Assignment to test conditions was random.

Procedure To overcome the external validity problem that is caused by laboratory experiments that present respondents with well-defined problems (Nickerson 1999), the experiment used a common real world problem faced by people within the industry. The creative task was similar to a task used by Redmond et al. (1993), however household insect spray was used as the product category rather than a 3-D Holographic TV. This category was chosen given all sample groups have had extensive exposure to it but it was not an account for either of the two agencies.

Subjects designed advertisements for a brand of household insecticide. Instructions were given on the cover page of their response booklet. Subjects were told about the product, which had a strong, brand-differentiating feature. Prior research (Stewart and Furse 1986; Stewart and Koslow 1989) suggests that having a brand-differentiating message is important to producing an effective, and thus appropriate, advertisement. The product feature highlighted was that the product broke down chemically after 30 min to become harmless. Subjects were told that the target audience was upper middle class, male and female, consumers aged 21–35.

Subjects were given instructions on how to develop advertisements in a two-step process, repeated three times in 60 min. They were asked to spend the first several minutes writing down a list of ideas on one page in the booklet. Then they were to spend the remainder of the 20 min block developing their best idea into a full advertisement in a two-page spread in the booklet. An example on how to use this process was also provided. Time was called after 20 min, 40 min and 60 min, asking subjects to move on to the next section.

Manipulations The first manipulation dealt with convergent thinking and primed subjects with past campaign information. Half received a one-line statement saying that the previous advertisement featured a disease carrying cartoon fly named “Fester”. This primed subjects to the long running “Lewie the Fly” campaign for *Raid* insecticide. When primed with a prior campaign subjects were also told the campaign was not effective so that priming effects would be due to mental set fixation rather than replication.

For the divergent thinking technique, subjects were asked to use a randomized key word that was unrelated to the domain as the basis for their thinking. The front page also included instructions on how to use the key words to generate ideas. To ensure key words with a range of associations, we drew our key words from data from the University of South Florida’s Word Association, Rhyme and Word Fragment Norms (Nelson et al. 2004). A list of 120 key words with a range of associations with insecticide was formed. A manipulation check was performed, post-experiment, confirming the degree of association these key words had with insecticide. On a seven-point scale from weak association (1) to strong association (7), the average association was 3.8 with a standard deviation of 2.0.

Pre-tests The experiment’s procedures and instruments were pre-tested on a group of 66 undergraduate students. Changes were made in relation to consumer-based knowledge, the product category unique selling proposition, and the reporting of past campaigns. Instructions were made simpler and clearer in relation to the need for a new set of ideas to be developed for each of the three advertisements.

Because second language students found the experiment extremely difficult, we focused on native English speakers.

Coding Four native English speaking graduate students judged the originality and appropriateness of the campaigns (see Koslow et al. 2003). Using graduate students had advantages including that they could be tightly instructed to make judgements, were paid and thus well motivated to complete the task accurately, and had the time available. Given that there were 474 campaigns to code, the approximately 100 h per judge needed to complete the task precluded other choices, like industry practitioners. To avoid fatigue in the coding process judges were told to take their time in the coding process and on average spent 10 h per week and not more than 20 h in any 1 week on the coding process.

To accurately assess how on strategy a campaign was, coders were explicitly told: the strategy, the target market, and the brand-differentiating message. Those advertisements that highlighted the brand-differentiating message in a way that would appeal to the target market were rated higher than those that omitted these aspects. To measure originality, judges made informed assessments regarding the statistical rarity of advertising content.

Judges underwent an extensive, two-stage training program. First, judges were given a copy of an advertisement and creative ideas page from two pre-test response booklets. The judges were also given a coders’ guide with definitions of the items upon which they were to judge. Without any further instructions they evaluated the ideas. The responses were collated and the researchers asked the judges to explain any differences between their judgments. The researchers also provided clarification of judging criteria on certain categories. This process was repeated a second time and there was a high level of understanding as to the basis of measurement. Judges were encouraged to discuss any perceptions they had regarding the coding instrument. In all cases, coders were blind to the experimental conditions.

After this initial training, judges assessed the first 10% of the final data with an even spread of responses coming from each of the treatments. From this measure it was found that two items were not adding any additional strength to the results and these measures were dropped. In all of the remaining measures there was a strong degree of agreement among the coders with the remaining items having a range of difference among the judges of two scale points or less at least 75% of the time. The rest of the main data was then coded. On average it took 30 min, per judge, for each response booklet to be coded.

Results

Measures Intercoder reliability for the four judges was high, with Winer’s intercoder reliability of .79 (Hughes and

Garrett 1990). As a result, the scores for each of the seven items were averaged across the four coders. To confirm the quality of items measuring the two dependent variables, originality and appropriateness, a factor analysis was also used. The factor analysis loadings and commonalities for the seven items are shown in Table 1. Overall, the model fits excellently with 93.9% of the variance explained by two factors. The eigenvalues-great-than-one and scree-plot rules indicated there were two significant factors. The scores for originality and appropriateness were constructed by averaging the four and three items that loaded on these factors. Cronbach’s alphas were .89 and .81, respectively.

Group profiles check To confirm that creatives were stronger divergent thinkers and account executives stronger convergent thinkers, yet otherwise similar, professional subjects were asked to self-report on skills and experiences. Table 2 details items relating to divergent thinking, strategy knowledge, and problem solving. A seven point scale was used anchored with “Strongly disagree” and “Strongly agree.” With 68.0% of the variance explained and acceptable eigenvalues and scree plots, the three factor model fit. Scales were formed by adding the corresponding items and these were then mean centered. As expected, creatives had higher levels of divergent thinking ability (.361 versus $-.284, p=.0005$), and account executives had higher levels of convergent-orientated expertise in strategic thinking (.176 versus $-.155, p=.051$). For problem solving skills, there was no statistical difference ($p=.188$). Subjects were asked if they had experience with three or more television campaigns or three or more consumer package goods. Although account executives had more experience with television (89.2% versus 79.6%) and creatives had more experience with consumer package goods (81.6% versus 70.8%), these differences were not statistically significant.

Model Mixed-measures analysis of variance is presented in Table 3. Non-significant interactions with the order term

were dropped. With six measures per subject two types of individual differences are possible. First is differences between individuals such that some people did better on all six measures than others who did less well on all six and this term is labelled *Subject(convergent X divergent X group)*. Some subjects did better on originality than appropriateness or *vice versa*, and this term is labelled, *Measure X subject(convergent X divergent X group)*. Effects are modelled as random effects, and thus all individual level differences (e.g., divergent, convergent and problem solving) are controlled for.

The model fits well with 71.2% of the variance explained. The interactions estimated were guided by the hypotheses and therefore three three-way interactions were included in the model, plus their two-way interactions. The one-way order effect was significant, but this only showed that the second and third advertisements were higher in both originality and appropriateness than the first. This shows that there was a mild learning effect and that 60 min was enough to learn the techniques. Also included was a measure X order interaction term which showed that the learning effect was stronger for originality than appropriateness.

Results The least square means for the interactions are in Figs. 1, 2 and 3. Figure 1 presents the effects on originality and appropriateness, with and without the use of the divergent thinking technique, for the three groups. The pairs circled in a solid line for creatives and account executives are significantly different ($\alpha=.05$), using joint confidence for originality and appropriateness, but the difference for students, circled in a dotted line, is not significant. Using the divergent thinking technique moved account executives to the upper left and traded-off appropriateness for originality. Creatives moved to the lower left, worse on both measures. H1 was not supported, but H4 and H5 were.

In Fig. 2, three pairs of points are presented which are the effects on originality and appropriateness, with and without use of the convergent thinking technique, for each

Table 1 Factor model of originality and strategy

Compared to other advertisements, this advertisement/campaign was...	Originality	Appropriateness (e.g., Strategy)	Commonalities
...novel	0.994	0.226	.941
...original	0.956	0.185	.947
...unexpected	0.883	0.369	.913
...different	0.931	0.177	.897
...a good fit with the client’s strategy	0.195	0.959	.958
...an appropriate strategy for the client	0.295	0.930	.952
...built on good strategy	0.212	0.955	.959
Eigenvalues	3.622	2.951	

Principal components factor analysis used, with VARIMAX rotation

Table 2 Factor analysis for self-reported divergent and convergent thinking and problem solving

	Divergent thinking ability	Problem solving skills	Convergent thinking expertise
I develop original ideas no one else thinks of.	.702	.272	-.095
I develop many alternative ideas, not just one.	.855	.068	.265
I think up a large number of ideas	.879	.043	.135
I am a good divergent thinker.	.816	.216	-.102
I understand the target consumer.	-.061	.274	.723
I understand the strategy to be used for the client.	.044	.129	.885
I understand marketing strategy in general.	.161	.182	.857
I am a good problem solver.	.097	.716	.212
I follow the right steps to solve advertising problems.	.100	.705	.226
I work my way through advertising problems.	.137	.763	.116
I know how to solve advertising problems.	.214	.766	.095
Variance explained by each factor	2.78	2.43	2.27
Cronbach's alpha	.757	.868	.808

of the three groups. All three pairs circled in a solid line are significantly different ($\alpha=.05$), using joint confidence for originality and appropriateness. Using a convergent thinking technique moved the ideas creatives developed to the lower right, reducing originality, but increasing appropriateness. However, for account executives, it moved them to the lower left, or worse on both dimensions. Students acted similarly to creatives. H2, H3 and H6 were supported.

Further evidence of the trade-off between originality and appropriateness comes from Fig. 3 which shows the interactions among measures, and the divergent and convergent techniques. Providing a convergent thinking

technique to subjects increases the appropriateness of their ideas at the cost of originality. However, the effects of this convergent thinking technique can be counteracted by adding a divergent thinking technique, bringing the ideas back up to the highly original, but less appropriate, region in the chart. That is, convergent thinking, and the domain specific priming it incorporated, focused subjects on the reservoir of knowledge they have to produce appropriate ideas, but one could just as easily move them away to different domains using divergent thinking creativity techniques.

Figure 3 also shows that use of the divergent thinking technique did not change the balance of originality and

Table 3 Mixed-measures analysis of variance for originality and appropriateness (e.g., Strategy)

	df	Type III sums of squares	P value
Between subjects effects:			
Convergent thinking technique	1	.989	.178
Divergent thinking technique	1	.677	.265
Group membership	2	45.642	<.001
Convergent thinking technique X divergent thinking technique	1	0.013	.876
Convergent thinking technique X group membership	2	2.130	.143
Divergent thinking technique X group membership	2	11.460	<.001
Subject(convergent X divergent X group)	148	376.408	<.001
Between subject error	314	170.773	
Within subjects effects:			
Order	2	3.424	.044
Measure	1	61.382	<.001
Measure X convergent thinking technique	1	7.789	<.001
Measure X divergent thinking technique	1	6.622	<.001
Measure X group membership	2	12.019	<.001
Measure X order	2	2.591	.036
Measure X convergent thinking technique X divergent thinking technique	1	7.797	<.001
Measure X convergent thinking technique X group membership	2	4.709	.003
Measure X divergent thinking technique X group membership	2	3.360	.014
Measure X subject(convergent X divergent X group)	148	178.895	<.001
Within subject error(measure)	314	121.611	

The repeated measures, originality and appropriateness, when combined under the repeated measures analysis, are jointly referred to in the table as “measures”

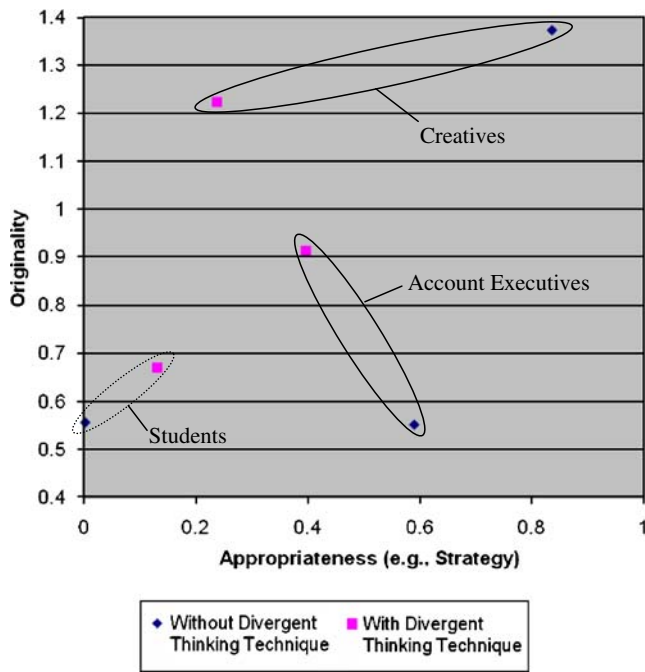


Figure 1 Least square means of originality and appropriateness by use of divergent thinking technique and group membership.

appropriateness when subjects had no convergent technique. Given that all subjects were put through a process where they were asked to develop a list of ideas, the divergent thinking technique had no significant effect over and above this process itself. The divergent thinking

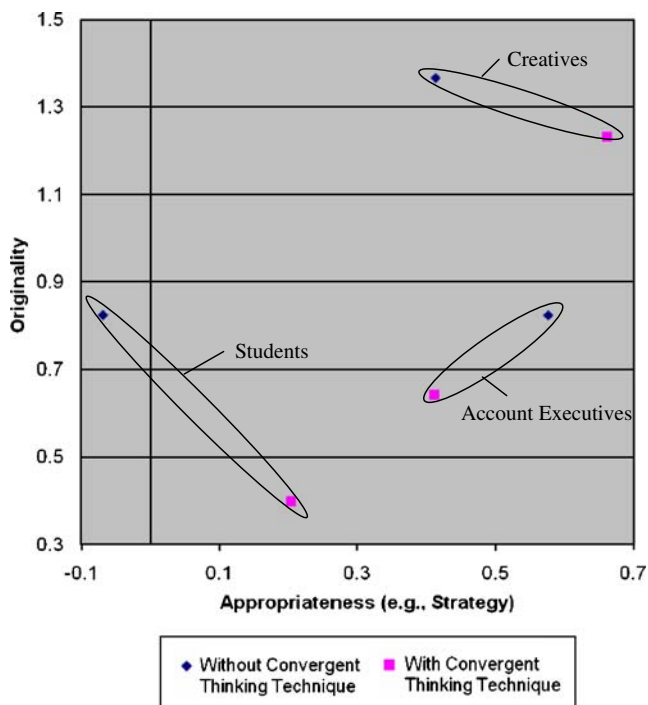


Figure 2 Least square means of originality and appropriateness by use of convergent thinking technique and group membership.

technique’s value was not observed universally, but only on those predisposed to benefiting from it.

Summary, discussion, implications and conclusions

Our results are in contrast to the bulk of the creativity literature which has proposed that divergent thinking creativity techniques are universally effective. While divergent thinking techniques can be effective this study extends the previous research by looking at trade-off effects between appropriateness and originality and finds that these techniques do not always improve creative outcomes. Use of industry participants provides the basis for understanding how respondent attributes, both domain specific knowledge and associative abilities, influence the effectiveness of different creativity techniques. The key finding is that domain experts can be brought out of their mental set fixation through divergent techniques.

The contrasting effects divergent and convergent techniques had on each sample group illustrate the importance of a person’s existing domain knowledge and associative abilities as moderating influences on creativity. It is evident that a base level of domain specific knowledge must accompany divergent thinking in order to achieve both appropriate and original ideas. A divergent thinking technique can take a person to a distant domain, but some knowledge of the initial domain must also be available to make the connection relevant.

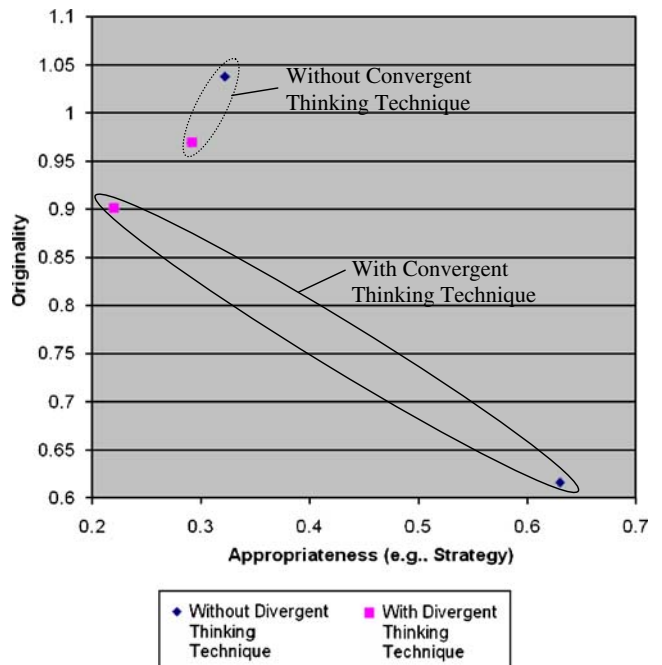


Figure 3 Least square means of originality and appropriateness by use of the divergent thinking technique and convergent thinking techniques.

When examining the influence of associative ability clearly some thought needs to be given to what kinds of divergent thinking technique improve a person's creative ideas because not all techniques are created equal. Although the divergent technique used in this research did not improve the originality of creatives' ideas, there are other techniques, notably Goldenberg et al.'s (1999) *Templates*, which may show more positive effects. Given the complex dynamics uncovered more research comparing the two is needed.

Contrary to conventional wisdom, convergent thinking techniques may improve the creativity of the ideas creatives produce. Assuming appropriateness is as strong a component in creativity as originality, a small relative decline in originality to gain appropriateness can sometimes be optimal. Creatives frequently encounter these convergent thinking techniques, or primes. The prime used in this study—that there was a previous failed campaign—is information commonly available in most client briefs. Indeed, one can consider most of the background information provided to the creatives in the brief as types of domain primes. Sutherland et al. (2004) note that there is much needed information left out of briefs and this absence means that creatives may not be doing the convergent thinking needed.

The findings have implications beyond advertising agencies and apply to research areas from product development to education. In many educational institutions the emphasis is being placed increasingly on developing large amounts of domain specific knowledge. While these knowledge reservoirs provide the basis for new idea combination processes, if too domain specific they may also result in mental set fixation. Unless we also teach skills in divergent thinking then we may be short-changing our students. Providing students with concentrated knowledge will give them ready answers to current questions, but not the associative abilities needed to create the significant new breakthroughs.

Many aspects such as time, instructions, and experimental conditions can affect the results of creativity tests (Harrington 1975). The results of this experiment only looked at two types of simple creative thinking priming techniques. It also only tested part of the creative thinking process, idea generation. Further research is needed to look at the influence of more complex techniques, time, and the many other influencing factors on the various stages of the creative thinking process. For example, domain experts given a greater length of time may be able to make highly original ideas more appropriate.

Another concern is the use of a single product category, household insecticide. Although no participant indicated that they worked on the category previously, those with more expertise in related consumer package goods categories may still have been advantaged. Because expertise exerts such a strong effect, future research should include a variety of

categories, ranging from more prevalent ones like automotive or retail to the more specialized.

Although using industry participants with varying characteristics provides insights into the creative thinking process, there are also limitations. Our research assumed the main difference among creatives, account executives and students is the level of domain relevant knowledge and associative skills. However, creatives and account executives could be different from each other and the general population for many more reasons than this due to their self-selection into these professions. For example, there may be important differences in personality, intelligence, or cognitive structure. On balance, the increased external validity from using industry professionals outweighs the potential internal validity issues those subjects introduce, as using more available students exclusively may lead to spurious results.

Given the upbeat tone taken by many creative thinking scholars it has long been a puzzle as to why divergent techniques aren't utilized more. In the advertising field, those who use techniques are frequently looked down on. The answer to this puzzle may be that creative thinking techniques are not a one-size-fits-all proposition. A technique that works well with one group does not necessarily work on another. Sometimes a convergent technique may be called for, but other times a divergent one. As for which one works best when, this is more complex and this research has begun to shed some light on these issues.

References

- Adelson, B. (1984). When novices surpass experts: the difficulty of a task may increase with expertise. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *10*(3), 483–495. doi:10.1037/0278-7393.10.3.483.
- Amabile, T. M. (1983). *The social psychology of creativity*. New York: Springer-Verlag.
- Amabile, T. M. (1988). A model of creativity and innovation in organizations. *Research in Organizational Behavior*, *10*, 123–167.
- Amabile, T. M. (1996). *Creativity in context*. Boulder, Colorado: Westview.
- Baughman, W. A., & Mumford, M. D. (1995). Process analytic models of creative capacities: Operations influencing the combination-and-reorganization process. *Creativity Research Journal*, *8*, 37–62. doi:10.1207/s15326934crj0801_4.
- Briskman, L. (1980). Creative product and creative process in science and art. *Inquiry*, *23*(1), 83–106. doi:10.1080/00201748008601892.
- Clapham, M. M. (1997). Ideation skills training: a key element in creativity training programs. *Creativity Research Journal*, *10*(1), 33–44. doi:10.1207/s15326934crj1001_4.
- Coney, J., & Serna, P. (1995). "Creative thinking from an information processing perspective: a new approach to mednick's theory of associative hierarchies". *Journal of Creative Behavior*, *29*, 109–130. 2nd Qtr.
- Csikszentmihalyi, M. (1996). *Creativity flow and the psychology of discovery and invention*. New York: HarperPerennial.

- de Bono, E. (1968). *New think: the use of lateral thinking in the generation of new ideas*. New York: Basic.
- Dewey, A., Steinberg, H., & Coulson, M. (1998). Conditions in which British artists achieve their best work. *Creativity Research Journal*, 11(4), 275–282. doi:10.1207/s15326934crj1104_1.
- Doyle, C. L. (1998). The writer tells: the creative process in the writing of literary fiction. *Creativity Research Journal*, 11(1), 29–37. doi:10.1207/s15326934crj1101_4.
- El-Murad, J., & West, D. C. (2004). The definition and measurement of creativity: What do we know? *Journal of Advertising Research*, 44, 188–201. June. doi:10.1017/S0021849904040097.
- Engle, D. E., Mah, J. J., & Sadri, G. (1997). An empirical comparison of entrepreneurs and employees: Implications for innovation. *Creativity Research Journal*, 10(1), 45–49. doi:10.1207/s15326934crj1001_5.
- Ford, C. M. (1996). A theory of individual creative action in multiple social domains. *Academy of Management Review*, 21(4), 1112–1142. doi:10.2307/259166.
- Frensch, P. A., & Sternberg, R. J. (1989). “Expertise and intelligent thinking: When is it worse to know better?”. In R. J. Sternberg (Ed.), *Advances in the psychology of human intelligence*. Hillsdale, NJ: Erlbaum.
- Goldenberg, J., & Mazursky, D. (2002). *Creativity in product innovation*. Cambridge UK: Cambridge University Press.
- Goldenberg, J., Mazursky, D., & Solomon, S. (1999). The fundamental templates of quality ads. *Marketing Science*, 18(3), 333–351. doi:10.1287/mksc.18.3.333.
- Gordon, W. J. J. (1961). *Synetics: the development of creative capacity*. New York/Evanston/London: Harper & Row.
- Griffin, W. G. (2008). From performance to mastery: Developmental models of the creative process. *Journal of Advertising*, 37, 95–108. Winter. doi:10.2753/JOA0091-3367370408.
- Guilford, J. P. (1950). Creativity. *The American Psychologist*, 5, 444–454. doi:10.1037/h0063487.
- Guilford, J. P. (1968). *Intelligence, creativity and their educational implications*. San Diego, California: Knapp.
- Harrington, D. M. (1975). “Effects of explicit instructions to “Be Creative” on the psychological meaning of divergent thinking test scores”. *Journal of Personality*, 43, 434–454. doi:10.1111/j.1467-6494.1975.tb00715.x.
- Hecht, H., & Proffitt, D. (1995). The price of expertise: Effects of experience on the water-level task. *American Psychological Society*, 6(2), 90–95.
- Hughes, M. A., & Garrett, D. E. (1990). Intercoder reliability estimation approaches in marketing: a generalizability theory framework for quantitative data. *JMR, Journal of Marketing Research*, 27(2), 185–195. doi:10.2307/3172845.
- Johar, G. V., Holbrook, M. B., & Stern, B. B. (2001). The role of myth in creative advertising design: Theory, process and outcome. *Journal of Advertising*, 30(2), 1–25.
- Kasof, J. (1995). Explaining creativity: the attributional perspective. *Creativity Research Journal*, 8(4), 311–366. doi:10.1207/s15326934crj0804_1.
- Kilgour, A. M. (2008). *Understanding creativity: the creative thinking process and how to improve it*. Staarbrucken Germany VDM Verlag.
- Kirton, M. (1976). Adaptors and innovators: a description and measure. *The Journal of Applied Psychology*, 62(5), 622–629. doi:10.1037/0021-9010.61.5.622.
- Koslow, S., Sasser, S. L., & Riordan, E. A. (2003). What is creative to whom and why? Perceptions in advertising agencies. *Journal of Advertising Research*, 43(1), 1–15.
- Koslow, S., Sasser, S. L., & Riordan, E. A. (2006). Do marketers get the advertising they need or the advertising they deserve? Agency views of how clients impact creativity. *Journal of Advertising Research*, 35(3), 81–101. doi:10.2753/JOA0091-3367350306.
- Kover, A. J., & Goldberg, S. M. (1995). The games copywriters play: Conflict, quasi-control, a new proposal. *Journal of Advertising Research*, 35, 52–61 November/December.
- Lemons, G. (2005). When the horse drinks: Enhancing everyday creativity using elements of improvisation. *Creativity Research Journal*, 17(1), 25–36. doi:10.1207/s15326934crj1701_3.
- Marsh, R. L., Landau, J. D., & Hicks, J. L. (1996). How examples may (and may not) constrain creativity. *Memory & Cognition*, 24(5), 669–680.
- Marsh, R. L., Ward, T. B., & Landau, J. D. (1999). “The inadvertent use of prior knowledge in a generative cognitive task”. *Memory & Cognition*, 27(1), 94–106.
- Martinsen, O. (1995). Cognitive styles and experience in problem solving: Replication and extension. *Creativity Research Journal*, 8(3), 291–298. doi:10.1207/s15326934crj0803_8.
- McFadzean, E. (2000). Techniques to enhance creative thinking. *Team Performance Management*, 6(3/4), 62–73. doi:10.1108/13527590010731989.
- McGann, A. E. (1986). Advertising education. *Journal of Advertising*, 15(4), 3.
- Mednick, S. A. (1962). The Associative basis of the creative process. *Psychological Review*, 3, 220–232. doi:10.1037/h0048850.
- Moorman, C., & Miner, A. S. (1997). The impact of organizational memory on new product performance and creativity. *JMR, Journal of Marketing Research*, 34, 91–106. February. doi:10.2307/3152067.
- Mumford, M. D., & Simonton, D. K. (1997). Creativity in the workplace: People, problems and structures. *The Journal of Creative Behavior*, 31, 1–6.
- Mumford, M. D., Whetzel, D. L., & Reiter-Palmon, R. (1997a). Thinking creatively at work: Organization influences on creative problem solving. *The Journal of Creative Behavior*, 31(1), 7–17.
- Mumford, M. D., Baughman, W. A., Maher, M. A., Costanza, D. P., & Supinski, E. P. (1997b). Process-based measures of creative problem-solving skills: IV. Category combination. *Creativity Research Journal*, 10(1), 59–71. doi:10.1207/s15326934crj1001_7.
- Nelson, D. L., McEvoy, C. L., & Schreiber, T. A. (2004). The University of South Florida word association, rhyme and word fragment norms, Retrieved August 16 2004, from <http://www.cyber.acomp.usf.edu/FreeAssociation/Intro.html>: 1–22.
- Nickerson, R. S. (1999). “Enhancing creativity”. In R. J. Sternberg (Ed.), *Handbook of creativity* (pp. 392–429). Cambridge, U.K.: New York: Cambridge University Press.
- Osborn, A. F. (1953). *Applied imagination (Rev Ed.)*. New York: Scribner.
- Redmond, M. R., Mumford, M. D., & Teach, R. (1993). Putting creativity to work: Leader influences on subordinate creativity. *Organizational Behavior and Human Decision Processes*, 55, 120–151. doi:10.1006/obhd.1993.1027.
- Reid, L. N., King, K. W., & DeLorme, D. E. (1998). Top-level agency creatives look at advertising creativity then and now. *Journal of Advertising*, 27(2), 1–16.
- Rositer, J. R. (2008). Defining the necessary components of creative, effective ads. *Journal of Advertising*, 37, 139–144. Winter.
- Runco, M. A. (2004). Creativity. *Annual Review of Psychology*, 55, 657–687. doi:10.1146/annurev.psych.55.090902.141502.
- Runco, M. A., & Charles, R. (1992). Judgments of originality and appropriateness as predictors of creativity. *Personality and Individual Differences*, 15(5), 537–546.
- Sasser, S. L., & Koslow, S. (2008). Desperately seeking advertising creativity: Engaging an imaginative ‘3Ps’ research agenda. *Journal of Advertising*, 37, 5–19. Winter. doi:10.2753/JOA0091-3367370401.
- Schilling, M. A. (2005). A ‘Small-World’ network model of cognitive insight. *Creativity Research Journal*, 17(2 & 3), 131–154. doi:10.1207/s15326934crj1702&3_2.

- Scott, G. M., Lonergan, D. C., & Mumford, M. D. (2004a). Conceptual combination: Alternative knowledge structures, alternative heuristics. *Creativity Research Journal*, 16(4), 361–388. doi:10.1207/s15326934crj1604_1.
- Scott, G. M., Leritz, L. E., & Mumford, M. D. (2004b). The effectiveness of creativity training: a quantitative review. *Creativity Research Journal*, 16(4), 361–388. doi:10.1207/s15326934crj1604_1.
- Sethi, R., Smith, D. C., & Whan Park, C. (2001). Cross-functional product development teams, creativity, and the innovativeness of new consumer products. *JMR, Journal of Marketing Research*, 38, 73–85. February. doi:10.1509/jmkr.38.1.73.18833.
- Simon, H. A. (1986). “How managers express their creativity.” *Across the Board*, Mar(3), 11–17.
- Simonton, D. K. (2003). Scientific creativity as constrained stochastic behavior: the integration of product, person, and process perspectives. *Psychological Bulletin*, 129(4), 475–494. doi:10.1037/0033-2909.129.4.475.
- Smith, S. M., Ward, T. B., & Schumacher, J. S. (1993). Constraining effects of examples in a creative generation task. *Memory & Cognition*, 21, 837–845.
- Smith, S. M., Ward, T. B., & Finke, R. A. (1995). “Principles, paradoxes, and prospects for the future of creative cognition”. In S. M. Smith, T. B. Ward, & R. A. Finke (Eds.), *The creative cognition approach* (pp. 327–335). Cambridge, MA: MIT.
- Stewart, D. W., & Furse, D. (1986). *Effective television advertising—a study of 1000 commercials*. Lexington, MA: Lexington Books.
- Stewart, D. W., & Koslow, S. (1989). Executional factors and advertising effectiveness: a replication. *Journal of Advertising*, 18(3), 21–32.
- Stewart, D. W., Cheng, Y., & Wan, H. (2008). Creative and effective advertising: Balancing spontaneity and discipline. *Journal of Advertising*, 37, 135–139. Winter.
- Sutherland, J., Duke, L., & Abernethy, A. (2004). A model of marketing information flow. *Journal of Advertising*, 33(4), 39–52.
- Torrance, E. P. (1974). *Torrance tests of creative thinking*. Lexington MA: Personnel.
- Wallas, G. (1926). *The art of thought*. New York: Harcourt Brace.
- Ward, T. B. (1994). Structured imagination: the role of conceptual structure in exemplar generation. *Cognitive Psychology*, 27, 1–40. doi:10.1006/cogp.1994.1010.
- West, D. C. (1999). 360° of creative risk. *Journal of Advertising Research*, 39, 39–50 January/February.
- West, D. C., & Ford, J. (2001). “Advertising agency philosophies and employee risk taking”. *Journal of Advertising*, 30, 77–91. 1 Spring.
- West, D. C., Kover, A. J., & Caruana, A. (2008). Practitioner and customer views of advertising creativity: Same concept, different meaning? *Journal of Advertising*, 37, 35–45. Winter.
- Wiley, J. (1998). Expertise as mental set: the effects of domain knowledge in creative problem solving. *Memory & Cognition*, 26(4), 716–730.
- Young, J. W. (1960). *A technique for producing ideas*. Chicago: Advertising.