Something old, something new: when people favor novelty over familiarity and how novelty affects creative processes
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CHAPTER 4
Unraveling effects of novelty on creativity

NOVELTY AND CREATIVITY

After extensively exploring the effects of growth versus security related cues on affective evaluations of novelty and familiarity, we will in Chapter 4 leave the realm of the mere exposure paradigm and turn to the field of creativity. In Chapters 2 and 3 we have shown how self-regulatory concerns with growth and security can influence evaluations of novel and familiar stimuli on a very basic level. Novelty Categorization Theory (NCT; Förster, Marguc, & Gillebaart 2010) inspired the studies discussed in these chapters. However, NCT holds implications and predictions for more complex cognitive consequences of novelty as well, and in this chapter, we will apply these implications to the field of creativity.

Creativity is essential to our survival. Our world is rapidly developing, and continuously changing. Creativity helps us cope with these developments and changes, and is, as such, crucial to keeping track of our surroundings. Furthermore, it is a key component in problem solving (Mumford, Mobley, Uhlman, Reiter-Palmon, & Doares, 1991; Runco, 1994; 2004; Torrance, 1971; Wallas, 1926). Creativity can be defined as producing ideas, insights, solutions, or products that are original (new) as well as useful (feasible) (Amabile, 1983; Paulus & Nijstad, 2003). As such, the creative process also allows us to flexibly adapt to changing environments (Flach, 1990; Runco, 1986; 1994).

NCT (Förster et al., 2010) predicts that to understand and grasp meaning of novel events, we must process them globally and integrate them into existing knowledge structures. Indeed, Förster, Liberman and Shapira (2009) have shown that novelty leads to increased global processing, broadening of mental categories, and more abstract thinking than familiarity. Such processes may further influence creative thinking. In this chapter, we will discuss how we think novelty and its cognitive consequences influence the creative process, and test our ideas in two studies.

Research has shown that affect, hedonic tone, motivation, learned behavior, approach/avoidance behavior, and temporal distance all have effects on the creative process (Baas, De Dreu, & Nijstad, 2011; Baas, De Dreu, & Nijstad, 2008; De Dreu, Baas, & Nijstad, 2008; Epstein, 1990; Friedman & Förster, 2000; 2001; 2002; Schimmel & Förster, 2008).
Among the many context influences on creativity tasks are task instructions. For example, mentioning “creativity” while introducing a creativity task increases creative performance (Harrington, 1975; Manske & Davis, 1968; Shalley, 1991; Shalley, 1995; Speller & Schumacher, 1975). Motivational underpinnings have been proposed: setting a creativity goal could lead to more intrinsic motivation, leading people to direct their effort and attention more towards the creativity task, increasing creative performance (Eisenberger & Rhoades, 2001, Shalley, 1991; Shalley, 1995; Shalley, Oldham, & Porac, 1987).

However, based on recent research and theorizing on the link between novelty and global processing (Fürster, Liberman, & Shapira, 2009; Fürster, Marguc, & Gillebaart, 2010), we suggest that such ‘creative’ instructions might include notions of novelty, since creativity implies the generation of something new. Fürster et al. (2009; 2010) reasoned and demonstrated that in novel situations, people use broad categories and global perception, which helps them understand unknown events. In one set of studies (Fürster et al., 2009), people were asked to either write about an event as if it was new for them (they had never before experienced the event) or as if it was familiar to them (they had experienced the event before). Subsequently, participants who thought and wrote about the novel event showed more global processing (a perception on the forest rather than the trees), broader mental categories (categorizing in terms of living versus non-living things instead of cats versus non-cats), and more abstract thinking (framing ‘locking the door’ as ‘attaining security’ instead of ‘turning a key’) than participants who thought and wrote about the familiar event. In another set of studies, Fürster and colleagues (2009) framed a processing style measure (Navon-letter task, Navon, 1977), a categorization task (Isen & Daubman, 1984) and an abstract thinking task (Gestalt Completion Task, Ekstrom, French, Harman, & Dermen, 1976) as either new (‘you have never done this task before’) or familiar (‘you have done this task before’) before administering them. Consistently, novelty framing led to more global processing, broader mental categorization, and more abstract thinking than familiarity framing. Thus, framing a task as new leads to a more global processing mode, and priming novelty carries over to subse-
quent task, leading to similar effects on processing mode. Moreover, broadening of mental categories and perception has been shown to enhance creativity (Ashby, Isen, & Turken, 1999; Förster, Friedman, & Liberman, 2004; Murray, Sujan, Hirt, & Sujan, 1990). Consistently, Friedman, Fishbach, Förster, and Werth (2003) showed that priming participants with global information processing (responding to big letters made up of small letters, see Navon, 1977) led to increased performance on creativity tasks (finding a creative title for a cartoon). Coming back to the enhancing effects of mentioning ‘creativity’ in creativity task instructions, one may suggest that the ‘be creative’ instruction might naturally remind people of ‘novelty, since the definition of creativity entails creation of ‘something new’. This novelty may in turn trigger global processing, which may then support creative generation. If this is true, merely thinking of novel events should trigger creativity, a hypothesis we will test in the present studies.

However, we do not expect a general positive influence of novelty or global processing on all aspects of creativity. Creativity can profit from both a convergent and a divergent thinking style. Divergent thinking is defined as the ability to produce multiple original responses to a specific stimulus (Clark, Veldman, & Thorpe, 1965; Guilford, 1959). It can be measured with an ‘instances-task’ (e.g. Friedman & Förster, 2001; Murray, Sujan, Hirt & Sujan, 1990; Smith, Ward, & Schumacher, 1993), during which participants are asked to generate as many ideas, objects, or uses for a certain object they can think of during a limited time period (e.g. ‘Name as many things you can think of that move on wheels in the next 8 minutes’). Convergent thinking is defined as the ability to select a correct response from a set of alternatives, or deducing it from a set of stimuli, and can be measured by the Remote Associates Task (RAT; Mednick, 1962). The RAT for measuring creative ability requires the participant to form ‘mutually distant associative elements into new combinations which are useful and meet specified as well as unforeseen requirements’. Specifically, participants are presented with sets of three words (e.g. wine, dark, cold) and are asked to identify the common link (e.g. cellar).
Although divergent thinking is usually considered more related to creativity than convergent thinking (Clark et al., 1965; Guilford, 1959), both can be adaptive in creative processes (Baas et al., 2008; De Dreu et al., 2008; Nijstad, De Dreu, Rietzschel, & Baas, 2010; Ward, 1975). For instance, while one can imagine divergent thinking to be beneficial when coming up with original ideas for a new commercial, a new kind of product packaging, or a way to get to your job when you are snowed in, convergent thinking may be more beneficial when you want to get to that one statistical insight, or reach that a-ha moment by finding one required connection or association between concepts or problems.

A divergent thinking style may benefit from global processing, cued by a novelty prime. The novelty prime may open mental categories, thereby activating remote exemplars of a certain category, supportive of a divergent thinking style. Local processing however, helps people to focus on the given material and to deduce the correct option, and may thus be more supportive of a convergent thinking style (Förster & Danenberg, 2010). As such, novelty may enhance creative performance when the creativity task at hand benefits from a divergent thinking style, but in fact might inhibit creative performance when the task at hand specifically requires specifically convergent thinking. While research shows that a global focus helps participants to find original solutions (Friedman et al., 2003; Friedman & Förster, 2010; Förster et al., 2004), the role of the local processing in creativity is relatively under examined (but see Baas et al., 2008, De Dreu et al., 2008, and Nijstad et al., 2010 for exceptions). We will explore our ideas in the present two studies.

We expect novelty to facilitate originality in a ‘divergent creativity task’, since novelty leads to global information processing, broadening of mental categories, and more abstract thinking, all of which may benefit a divergent thinking style leading up to original responses. We tested this hypothesis in Experiment 4.1. In this Experiment, we also examined the effects of novelty on a noncreative task, to rule out the possibility that novelty priming generally enhances motivation. This would follow from the suggested ‘intrinsic motivation/task involvement’ explanation for the positive effects of mentioning creativity in task instructions (Ei-
senberger & Rhoades, 2001, Shalley, 1991; Shalley, 1995; Shalley et al., 1987). Additionally, in this study we aimed to show that the effect of the novelty prime carries over to the ‘unrelated’ creativity task.

However, we would expect novelty to inhibit performance on a creativity task when a convergent thinking style is required. Novelty has shown to lead to global processing, broadening of mental categories, and abstract thinking. As we have explained above, we expect these consequences of novelty to be disadvantageous for convergent thinking. In fact, local processing may be beneficial in this case, and novelty may therefore inhibit performance on a ‘convergent creativity’ task. We tested this hypothesis in Experiment 4.2.

**Experiment 4.1: Novelty priming and divergent thinking**

In this experiment, we aimed to explore the effects of novelty priming on creativity. By using a creativity task that requires a divergent thinking pattern for creative performance, we expected to demonstrate that novelty priming would lead to a higher creative performance than familiarity priming.

**Participants**

99 Undergraduate students (75 females, \( M_{\text{age}} = 21.4 \) years, \( SD = 3.61 \)) participated. We included ‘creative versus noncreative task’ as a between factor in the design. Participants were randomly distributed over 4 conditions (2 between: novelty/familiarity x 2 between: creative/noncreative task), and signed an informed consent form. After completing the experiment, participants were rewarded with course credit.

**Method**

In order to prime participants with novelty or familiarity priming, we
used a priming procedure adapted from Förster et al. (2009). This priming procedure has been shown to influence several measures of global versus local processing in that novelty priming consistently leads to more global processing than familiarity priming. Participants in the novelty condition were instructed to spend 5 minutes writing about a cruise vacation as if they had never been on one, while participants in the familiarity condition were instructed to spend 5 minutes writing about a cruise vacation as if they had been on one. These priming instructions did not differ for the creative and noncreative task conditions. Subsequently, participants performed the creative or noncreative task according to condition, and were told this task was unrelated to the task they just performed.

In the creative task conditions, we used an aforementioned instances task from a creativity assessment (Wallach and Kogan, 1965). Participants were asked to name as many things they could think of that moved on wheels, and did so for 8 minutes. Data from the creativity task was scored on the following four components (see Baas, De Dreu, & Nijstad, 2008; Guilford, 1967; Mumford, 2001; Torrance, 1966, for similar procedures):

1. **Originality**: If a response was given by more than 5% of the participants, the participant received no points for this response. If the response was given by 1-5% of the participants, one point was rewarded. If the response was given by only 1% of the participants, two points were rewarded.
2. **Fluency**: The total amount of valid responses given.
3. **Flexibility**: The total amount of different categories used (e.g., ‘transportation’, ‘toys’)
4. **Elaboration**: Participants received one point if there was a detailed answer, for example ‘the tram passing by my house’, as opposed to ‘tram’.

In order to control for the contamination between Originality and Fluency (more answers resulting in more original answers) we calculated an Originality Ratio, by dividing the Originality score by the Fluency score.
We expected a facilitating effect of the novelty prime specifically on the Originality of the answers, since this dimension best reflects divergent thinking, i.e., the generation of original ideas. We did not expect novelty priming to affect the Fluency dimension, since this measure includes also unoriginal ideas, and thus reflects quantity instead of qualitatively different responses (see Friedman & Förster, 2001). As for the Flexibility dimension, we did not expect novelty priming to have a significant effect, since we suggest that broadening of mental categories would not necessarily influence one’s capacity or ability for flexibly switching between different categories. While this factor may contribute to creativity in general, we did not think it would profit from global processing. Elaboration in the answers seems to profit more from persistence than the generation of original ideas and thus should not be affected, or if anything be affected by local processing (see Baas et al., 2008).

The noncreative task was taken from the analytical reasoning section of the Graduate Record Examination. In the introduction, a set of conditions was given (e.g. George prefers Beethoven over Bartók). Next, participants were asked four questions where they had to indicate which they thought was the only correct answer from four options based on the given conditions. Participants had to answer each question within 2 minutes, and thus had 8 minutes to complete the task. Answers were scored as correct or incorrect, and participants got one point for every correct answer, leading to a minimum score of 0, and a maximum score of 4.

Both before the novelty or familiarity priming and after the creative or noncreative task, mood was assessed by asking participants how they were feeling on a 7-point Likert scale (1 (very bad) – 7 (very good)). Finally, participants were debriefed and rewarded.

Results

The effect of novelty versus familiarity on creative performance was explored using a 2 (between: novelty/familiarity) x 5 (within: originality/originality ratio/fluency/ flexibility/elaboration) Manova. Means and
standard deviations are displayed in Table 4.1.

### Table 4.1. Means and standard deviations on all creativity components and the noncreative task for the novelty and familiarity conditions.

<table>
<thead>
<tr>
<th></th>
<th>Novelty</th>
<th>Familiarity</th>
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<tbody>
<tr>
<td></td>
<td>M (SD)</td>
<td>M (SD)</td>
</tr>
<tr>
<td>Originality</td>
<td>5.88&lt;sup&gt;a&lt;/sup&gt; (4.15)</td>
<td>3.40&lt;sup&gt;b&lt;/sup&gt; (2.78)</td>
</tr>
<tr>
<td>Originality Ratio</td>
<td>.21&lt;sup&gt;a&lt;/sup&gt; (.13)</td>
<td>.13&lt;sup&gt;b&lt;/sup&gt; (.10)</td>
</tr>
<tr>
<td>Fluency</td>
<td>26.71 (6.04)</td>
<td>25.64 (6.30)</td>
</tr>
<tr>
<td>Flexibility</td>
<td>2.21 (.66)</td>
<td>2.32 (.75)</td>
</tr>
<tr>
<td>Elaboration</td>
<td>1.08 (1.28)</td>
<td>1.00 (1.11)</td>
</tr>
<tr>
<td>Noncreative task</td>
<td>2.00 (1.00)</td>
<td>2.20 (.87)</td>
</tr>
</tbody>
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*Note. Means with different superscripts in the same row differ at the  p < .05 level.*

There was no significant interaction, \( F(6,42) = 1.61, p = .17 \), and we proceeded to interpret simple main effects to test our specific predictions (see Rosnow & Rosenthal, 1996). As expected, participants primed with novelty gave more original answers than participants primed with familiarity, \( F(1,47) = 6.05, p < .05, \eta_p^2 = .67 \), also when controlling for Fluency by using the Originality Ratio, \( F(1,47) = 6.48, p < .05, \eta_p^2 = .70 \). As expected, novelty priming did not affect Fluency, \( F(1, 47) = .34, p = .57 \), Flexibility, \( F(1,47) = .31, p = .58 \), or Elaboration, \( F(1,47) = .06, p = .81 \). A one-way Anova showed no effect of novelty condition on noncreative performance, \( F(1, 48) = .57, p = .45 \). Means and standard deviations are displayed in Table 4.1. Also, mood did not differ between the novelty and creativity conditions before or after the priming phase, and mood did not mediate any of the effects.

Summarizing, priming novelty led to more original answers in a ‘divergent creativity’ task, moreover demonstrating that a processing style triggered by novelty priming can carry over to an unrelated task.
ditionally, novelty priming did not affect performance on a noncreative task, ruling out the possibility that novelty generally primes motivation leading to better overall performance.

**Experiment 4.2: Novelty framing and convergent thinking**

In this experiment, we aimed to show that novelty does not generally lead to increased creative performance. We included a creativity task that requires a convergent thinking pattern in the design. We expected novelty to inhibit performance on this creativity task, compared to a familiarity and control condition.

**Participants**

62 Undergraduate students (54 females, $M_{age} = 21.3$ years, $SD = 7.16$) participated. Participants were randomly distributed over 3 conditions (3 between: novelty/familiarity/control), and signed an informed consent. After completing the experiment, participants were rewarded with course credit.

**Method**

In this study, a framing technique similar to the one used in Förster et al. (2009) was used. This framing was shown to replicate findings of novelty priming as used in Experiment 4.1 on diverse measurements of global versus local processing. In the novelty condition, the creative task was framed as ‘a new task, a task you have never done before, a task you will now see and do for the first time’. In the familiarity condition, the creative task was framed as ‘a familiar task, a task that you have probably seen or done before’. In the control condition, neither novelty nor familiarity of the task was mentioned.

In order to measure a convergent thinking aspect of creativity, we
used an adapted version of the aforementioned Remote Associates Task (RAT; Kray, Galinsky, & Wong, 2006; Mednick, 1962) that consisted of 30 items, presented in a random order. Of these items, 10 were relatively easy (toe, shoe, walk – foot, participants usually answer 8 out of 10 correctly), 10 were ‘medium’ (warm, night, striped – pajamas, participants usually answer 5 out of 10 correctly), and 10 were relatively difficult (pig, egg, fat – bacon, participants usually answer 2 out of 10 correctly). Before starting on the 30 test items, participants practiced on 5 easy items. Participants received 1 point for every correct answer. Scoring for the easy, medium, and difficult items was divided, so the minimum score for each of these sets was 0, and the maximum score was 10. We especially expected an effect of novelty framing on scores on the difficult items, since performance on the easy and medium items may be hard to counteract, since they may be solved effortlessly.

After participants were randomly assigned to one of the conditions, they received instructions for the RAT, which was framed according to experimental condition. Participants then proceeded with the practice and test items. Subsequently, they were asked how much they liked the task, and how motivated they were to perform the task (both on 7-point Likert scales reaching from 1 (not at all) to 7 (very much)). Finally, participants were debriefed and rewarded.

Results

A 3 (between: novelty/familiarity/control) x 3 (within: easy/medium/difficult items) Manova was conducted to explore effects of novelty/familiarity framing on scores on the easy, medium, and difficult RAT-items. Means and standard deviations are displayed in Table 4.2.

We found no significant interaction effect, \( F(6,116) = 1.61, p = .15 \), and proceeded to interpreted the simple main effects to test our predictions (see Rosnow & Rosenthal, 1996). There was an expected effect of framing condition on the sum score on the difficult items, \( F(2,59) = 4.20, p < .05, \eta_p^2 = .13 \).
Table 4.2. Mean sum scores and standard deviations on easy, medium, and difficult items for all three framing conditions (novelty, familiarity, control).

<table>
<thead>
<tr>
<th></th>
<th>Novelty</th>
<th>Familiarity</th>
<th>Control</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>M (SD)</td>
<td>M (SD)</td>
<td>M (SD)</td>
</tr>
<tr>
<td>Easy</td>
<td>6.48 (1.34)</td>
<td>6.50 (2.06)</td>
<td>6.71 (1.96)</td>
</tr>
<tr>
<td>Medium</td>
<td>3.91 (1.78)</td>
<td>4.41 (1.76)</td>
<td>4.76 (2.59)</td>
</tr>
<tr>
<td>Difficult</td>
<td>.43a (1.66)</td>
<td>1.23b (1.51)</td>
<td>1.06b (1.03)</td>
</tr>
</tbody>
</table>

Note. Means with different superscripts in the same row differ at the p < .05 level.

Subsequent contrast analyses showed that participants in the novelty condition performed worse than participants in the familiarity condition, \( t(59) = -2.77, p < .01 \), and control condition, \( t(59) = -2.03, p < .05 \). The familiarity and control conditions did not differ, \( t(59) = .54, p = .59 \), indicating an inhibitory effect of novelty rather than a facilitative effect of familiarity. As predicted, no effects of framing condition were found for the easy, \( F(2,62) = .09, p = .91 \), and medium items, \( F(2,62) = .90, p = .41 \). Participants did not differ in how much they liked the task, or how motivated they were. Liking of the task and motivation during the task did not mediate any of the effects.

Discussion

Two studies revealed a differential effect of novelty on creativity tasks that benefitted from either convergent or divergent thinking styles. Novelty had a beneficial effect on creative task performance when the task benefited from divergent thinking, but in fact had an inhibiting effect on creative task performance when the task benefited from convergent thinking. Importantly, through measuring mood in Experiment 4.1 and liking of the task in Experiment 4.2, we think that mood as a mediator is unlikely. Mood was also not responsible for the effects of novelty on
global/local processing in former studies and the inductions we used have been shown not to elicit different moods (Förster et al., 2009). Additionally, in the first study, we ruled out a general motivational effect of the prime by adding a noncreative task to the design. Novelty versus familiarity priming had no effect on noncreative task performance, suggesting that the effects of novelty priming were indeed specific to the creativity task. Furthermore, Experiment 4.1 demonstrated that effects of a novelty prime can carry over to a subsequent, allegedly unrelated task.

In Experiment 4.1, the beneficial effect of novelty was limited to the Originality dimensions of the divergent creativity task. This was according to our expectations, since a divergent thinking style would be most beneficial on these dimensions. The global processing, abstract thinking, and broader mental categories would make it more likely for an original response to emerge. Divergent thinking does not necessarily have to lead to, for instance, more responses in general (Fluency, see also Friedman & Förster, 2001, for a similar lack of fluency effects). Also, we did not expect the global processing and broadening of mental categories to change one’s ability or capacity to switch between categories (Flexibility), or the amount of detail in one’s responses (Elaboration).

Experiment 4.2 revealed a detrimental effect of novelty framing on performance on the difficult items of the RAT, and not on the easy and medium items. We foresaw these effects, since the easy and medium items are relatively simplistic to begin with, and would thus require fewer resources. This may mean performance on these items is hard to debilitate, since they can be solved effortlessly, similar to for instance simple calculations as ‘1+4=?’. This may be why our reasonably subtle framing had no effect on these items.

Related Research

Findings from both studies shed some light on the effects of novelty on the creative process, adding to recent studies on novelty’s effects on information processing (Förster et al., 2009; Förster et al., 2010).
Although different studies have shown effects of novelty on basic cognitive processes such as global processing, mental categorization, and abstract thinking (Förster, 2009; Förster, Liberman, & Shapira, 2009), little is known about other, more complex cognitive consequences of novelty. After exploring how several psychological determinants (regulatory focus, power, color, breadth of categorization) influence how we evaluate affectively the novel and familiar in Chapters 2 and 3, we have in this chapter started exploring independently novelty’s effects on creativity, creating a more elaborate map of novelty’s characteristics, value, and effects.

In the Introduction to this chapter we have mentioned the enhancing effects of mentioning creativity in creativity task instructions (Harrington, 1975; Manske & Davis, 1968; Shalley, 1991; Shalley, 1995; Speller & Schumacher, 1975). Supposedly, mentioning of creativity would heighten intrinsic motivation, leading to more involvement in the task and subsequent focus on task requirements, resulting in better creative performance (Eisenberger & Rhoades, 2001, Shalley, 1991; Shalley, 1995; Shalley et al., 1987). However, we beg to differ. Our findings demonstrate the effects of a novelty prime can carry over to a supposedly unrelated creativity task and can cause both increased and decreased creative performance, depending on the task at hand. This suggests that the intrinsic motivation/task involvement explanation for task instruction effects does not necessarily cover the whole story. Instead, we propose a possibly additional process where processing and/or thinking styles that can be triggered or affected by for instance novelty priming influence different components of creative performance. This process may also be able to account for the effect of mentioning creativity in task instructions since ‘creativity’ may trigger ‘new’; after all, novelty is inherent to creative performance. The activation of ‘new’ may further influence processing styles, thereby affecting the creative process. Future research may show more explicitly whether mentioning creativity indeed activates thoughts of novelty; for such research, lexical decision tasks may be introduced to measure accessibility of novelty related concepts after exposure to for instance instructions of creativity tasks.

Following studies that have shown convergent and divergent thinking
as orthogonal constructs (Clark et al., 1965), the findings also add to literature on creativity as a multi-component construct (Baas et al., 2008; De Dreu et al., 2008; Nijstad et al., 2010). For instance, our studies can be related to work that has been done on the dual pathway to creativity model (De Dreu et al., 2008; Nijstad et al., 2010). The dual pathway to creativity model entails that there are two functionally distinct pathways to creativity. The flexibility pathway describes creative performance through cognitive flexibility; the capacity people have to switch between mental categories, but also between different approaches to a problem or question, and different perspectives. The persistence pathway entails the amount of focused, task-directed effort that can be sustained during the task. This model was developed to explain mood effects on creative performance: Activating positive mood states such as happiness and elations tend to lead to more creativity through a cognitive flexibility process, while activating negative mood states such as anger and fear seem to cause more creativity through perseverance (De Dreu et al., 2008). Additionally, through the flexibility pathway, more original answers are evoked, while the persistence pathway leads to more unique ideas through within-category fluency (more non-redundant answers).

The dual pathway to creativity model may have some overlap with our reasoning and findings. As mentioned, novelty has been shown to lead to global processing (Förster, et al., 2009), and global processing can lead to enhanced creativity (Ashby et al., 1999; Förster, et al., 2004; Murray et al., 1990; Friedman et al., 2003). Global processing is mentioned in the dual pathway to creativity model as being beneficial to the cognitive flexibility pathway rather than the persistence pathway (Nijstad et al., 2010). The cognitive flexibility pathway allows for more original responses than the persistence pathway, and indeed, our novelty priming led to more original answers in a divergent thinking task for measuring creativity (Experiment 4.1). As such, our findings overlap with predictions of the cognitive flexibility pathway in the model. On the other hand we found a disadvantageous effect of novelty framing on a convergent thinking task. As the dual pathway to creativity model mainly describes what moods and processes lead to more of either kind of creativity through different pathways, we have now expanded and
shown that one and the same phenomenon may cause more creativity through one pathway, and less through another.

Implications and Concluding Remarks

Although several studies have shown that novelty priming and novelty framing lead to global processing as opposed to local processing (Förster, 2009; Förster et al., 2009), we have not shown this explicitly in our studies. As such, future research may focus on explicitly showing that indeed changes in processing mode and changes in breadth of mental categorization following a novelty prime or frame can account for novelty’s enhancing as well as inhibiting effects on creativity, by for instance administering a Navon-letter task (Navon, 1977) after priming or framing and before creativity assessment.

Future research on the subject may also focus on further ruling out mood as a driving factor in these effects. Although we do not believe our novelty priming and framing would cause mood shifts driving the effects, we also cannot fully rule out the possibility. We measured participants’ mood through self-reports before and after novelty priming in Experiment 4.1 and found no effects of priming, or mediating effects on creativity. However, we did not explicitly measure mood in Experiment 4.2. As such it is theoretically possible that the inhibitory effect of novelty on the convergent creativity task is due to a negative mood caused by the new task, since one might propose that people are afraid of new tasks, or just plain do not want to do them. Importantly, however, we did measure liking of the task, and motivation to perform the task. Both measures did not differ as a function of novelty/familiarity/control priming. Liking of the task and motivation also did not mediate any effects of framing on convergent creative task performance. Therefore, we consider it highly unlikely that mood played a significant role in these effects. Furthermore, both the priming and framing procedure were adapted from Förster et al., (2009), who, in 6 studies found no mediating effects of mood in effects of novelty or familiarity on global versus local processing, categorization breadth, and abstract thinking.
Also, though there are several researchers who propose people hold a more positive attitude towards familiarity, and a rather negative attitude towards novelty (Garcia Marques, Mackie, Claypool, & Garcia-Marques, 2004; Garcia-Marques & Mackie, 2000; Harmon-Jones & Allen, 2001; Monahan, Murphy, & Zajonc, 2000), novelty categorization theory (Förster et al., 2010) postulates that generally, people are led by a motive to know (Kagan, 1972) and a willingness to understand and find meaning when they are confronted with novelty. An exception is made for threatening novelty, which would indeed lead to a negative mood, and maybe even fear. Since the test situations were benign (participants had taken part in psychological tests before and were used to the experimental setting) and similar in both experiments, we do not believe participants perceived a simple novel creativity task as threatening, but rather were quite neutral on the subject, deploying more of an ‘ok, let’s get it done’-attitude. Taken together, we do not believe our novelty and familiarity priming led to significant changes in mood or emotions, and that mood or emotions did not drive or mediate our findings. However, we cannot fully rule out the possibility that there were mood effects, since we only used explicit self-report measures that may not have been sensitive enough to detect more subtle changes in mood or emotions. Future research on the subject may also consider adding other measures of mood rather than the self-report scales used in these two experiments, such as an implicit emotion measure (e.g., IPANAT, Quirin, Kazén, & Kuhl, 2009), or facial EMG measures.

For now, our findings hold implications for several applied settings such as the field of education and the consumer domain. In the field of education, when the goal is to teach children to creatively solve problems (math problems, societal problems, economical problems), it might be wise to optimize their environment to support their learning process. If you want students to use a divergent thinking style like in for instance many societal problems, emphasize the novelty of the task or problem. However, if the problem requires creatively converging towards one correct alternative, as often is the case with math problems, emphasizing how familiar the students are with the kind of problem they are solving may be more useful. By producing a ‘fit’ between learning environment
and the kind of creativity required for specific problems, students may get to a solution faster, which could help them the next time they need to solve a problem.

In the organizational domain, if you want your employees to display divergent creativity, it might be a good idea to put them in a new environment, or to add novel objects like design coffee mugs, or weird novel chairs to the familiar work environment. This way, novelty may be primed in your employees, causing them to display more originality in their ideas. However, if you desire a creative outcome based on a convergent thinking process, you may want your employees to be surrounded by familiar things like for instance pictures of their loved ones, and keep novelty in the work environment to an absolute minimum.

In sum, in this chapter we have hypothesized and demonstrated that the effects of novelty priming and framing on creativity are at least twofold. Novelty can benefit the creative process, but only if divergent thinking, leading to original answers, is required. If the creative process at hand requires convergent thinking, deducing a correct alternative from a set of options, it might actually be useful to see beauty in the familiar, and let the unknown remain unloved.

In the General Discussion (Chapter 5), we will first summarize main findings from Chapters 2, 3, and 4. Subsequently, I will discuss merits and limitations of the studies, possible theoretical as well as applied implications, and suggestions for future research. Finally, I will formulate concluding remarks.