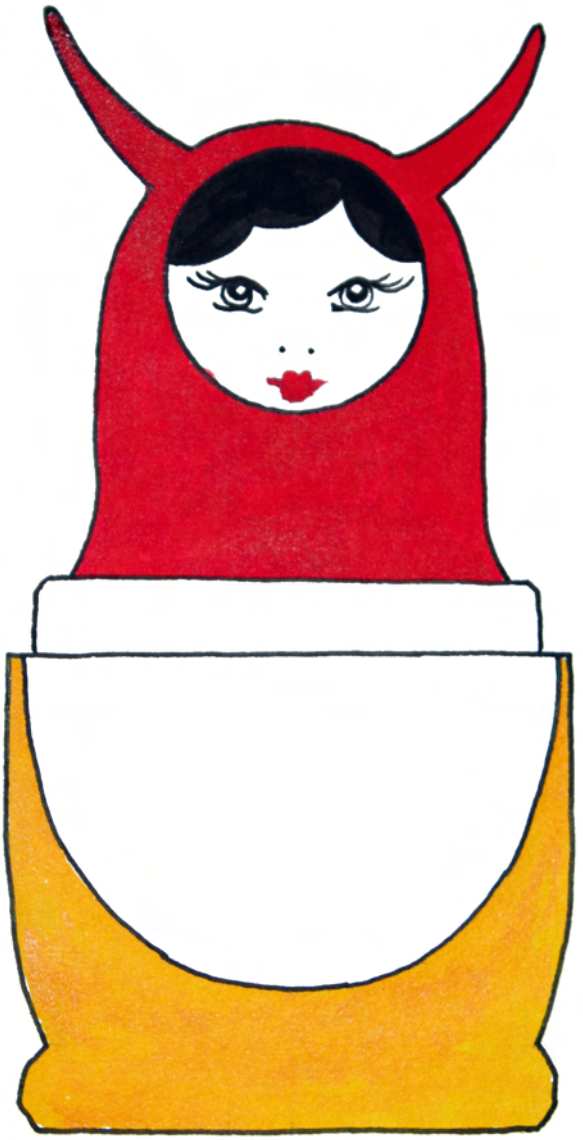
LAURENS ROOK

Imitation in Creative Task Performance



Imitation in Creative Task Performance

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Imitatie op creatieve taken

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Preface

Matryoshka dolls are Russian wooden handicraft figures typically consisting of a series of perfect copies of traditional peasant wives that only differ from each other in terms of scale. As a metaphor to the creative process, many behavioral researchers would consider matryoshkas worthy of research attention only if they contained a series of unexpected and radically novel objects such as – say – a peasant wife followed respectively by a house on chicken legs, a golden fairytale fish and a magic invisibility cap. If matryoshkas consisted of a series of perfect imitations or slight modifications – as they typically do – they would not be considered of interest for further analysis and be left out of the discussion. Even though it would seem sheer nonsense to reject traditional matryoshkas on such grounds, the purpose of this dissertation was to prove via laboratory experiments that the behavioral study of the creative process reflects exactly this kind of attitude towards imitation in creative task performance.

First, I would like to express my gratitude to my supervisor Daan van Knippenberg for teaching me the art of conducting experimental behavioral research and for the many lessons in how to translate this research into well-composed papers. It was a learning-by-doing process that most definitely sharpened my translation skills. Second, I would like to express my thanks to the Erasmus Research Institute of Management for providing such outstanding research facilities and for offering a vibrant and culturally diverse working environment. A most special “thank you” goes out to *моя любимая* Olga for her much appreciated practical and moral support, and for her inspiring teachings on Russian fairytales.

All my colleagues at the departments of Management of Technology and Innovation and Organization and Personnel Sciences enabled me to spend many pleasant years at the RSM/Erasmus University. Many in one way or the other contributed to the present dissertation: Anne, Daan, Hanneke, Steffen, Wendy and my “paranimfen” Frederic and – most specifically – Natalia were often very helpful with their detailed knowledge on statistics, whereas Natalia together with Betina, Dicea and Myra were of vital importance in keeping up the atmosphere in the department: How I miss the entertaining tea breaks! I would also like to thank Robert Verburg and my colleagues of the department of Organizational Behavior and Innovation at Delft University of Technology for providing me with the opportunity to finish my project there. A final word of thanks goes out to my friends, especially Adriaan, Arjan, Debbie, and – of course – Elja and to my parents for the necessary distraction from work-related issues and for the continuous support during this project. A big thank you!

Contents

1.

Imitation in Creative Task Performance: A Theoretical Framework

"All in all, the creative act is not performed by the artist alone"

Marcel Duchamp

"Good artists borrow, great artists steal"

Pablo Picasso

"Build on the ideas of others"

IDEO brainstorming rule

Introduction

Performing creative tasks through imitation of relevant product features is common practice for individuals working in creative domains (e.g., Dahlin & Behrens, 2005; Lieberman & Asaba, 2006; Schulz, 2001). In those domains, innovation often stems from processes of cross-fertilization among designers and/or engineers as a result of which newly developed technologies, products, and ideas clearly resemble existing models (Hargadon, 2002; Hargadon & Douglas, 2001; Hargadon & Sutton, 1997; Sutton & Hargadon, 1996). Research in innovation diffusion for instance shows that the spread of novel ideas, opinions, or products throughout society benefits from copying the performance of others (e.g., Henrich, 2001; Henrich & Gil-White, 2001). This indicates that developing a more detailed insight in the processes underlying imitation in creative task performance thus is an essential part of understanding – and ultimately managing – creativity and innovation.

Research so far has pointed to sociological (e.g., Abrahamson & Rosenkopf, 1993, 1997) and economic (e.g., Apesteguia, Huck, & Oechssler, 2003; Rogers, 2003; Valente, 1995) effects of imitation on innovation diffusion. There is, however, a strong need to also take psychological mechanisms into account (Rook, 2006). Admittedly, psychological factors underlying such transmission processes have been formally modeled so as to understand outcomes on a more general population level (e.g., Boyd & Richerson, 1985; Henrich, 2001; Henrich & Boyd, 2002). It has, nonetheless, been argued that especially psychological determinants on the micro-level of the individual are largely left unspecified (Fiol & O'Connor, 2003). Little knowledge thus exists about psychological determinants of imitation in creative settings. One important reason

may be that the majority of psychological research into imitation has been conducted from comparative (e.g., Tomasello, Savage-Rumbaugh, & Kruger, 1993), developmental (e.g., Meltzoff & Prinz, 2002; Rogers & Williams, 2006), and social learning points of view (e.g., Bandura, 1971, 1977; Miller & Dollard, 1941). Another reason may be that most behavioral research into creativity has been framed in terms of a distinction between creativity vs. constraints to creativity (e.g., Smith, Ward, & Finke, 1995), in which the influence of models in creative tasks is understood accordingly (e.g., Jansson & Smith, 1991; Shalley & Perry-Smith, 2001; Smith, Ward, & Schumacher, 1993). As a result, scholars in imitation and creativity research have up till now largely ignored imitation in creative tasks.

Nonetheless, research into the determinants of imitation in creative tasks is highly relevant, especially for those working in organizations in so-called "creative industries" (Caves, 2000), which are characterized by a heavy reliance on the individual creativity, skill and talent of their employees (DCMS, 2001). The overall objective of this dissertation is to demonstrate that imitation is an important component of creative task performance, which sometimes negatively influences creativity as is traditionally maintained, but other times even positively contributes to creativity. In that light, the aim of the present chapter is to provide a conceptual and empirical starting point for the study of imitation in creative task performance, and to put the subject of imitation more firmly on the agenda of behavioral research on creativity and innovation. Therefore, in the next sections of this chapter the following issues will be addressed in greater detail: (a) imitation and creativity, and (b) imitation in creative task performance. The chapter will conclude with an overview of the present dissertation.

Imitation and Creativity

Common wisdom has it that 'apes ape' and what 'monkeys see, monkeys do'. Humans beings, however, by far and beyond outperform apes in their capacity for imitation (e.g., Tomasello et al., 1993; Whiten, Horner, Litchfield, & Marshall-Pescini, 2004). Imitation in *Homo sapiens* has been shown to start developing within several days after birth (Meltzoff & Moore, 1977), and perhaps even from a few hours after birth onwards (Meltzoff & Moore, 1983, 1989). Not surprisingly, copying the behavior of others is such a central capacity in mankind that humans have even been labeled "imitation machines" (Tomasello, 1999, p. 159), and "the most imitate creatures on the planet" (Prinz & Meltzoff, 2002, p. 1).

Because imitation is a widespread cultural phenomenon, the topic was among the first to be explored in psychological research (e.g., Le Bon, 1895; Tarde, 1903). Over the years, several edited volumes (e.g., Bandura, 1971; Miller & Dollard, 1941; Simmel, Hoppe, & Milton, 1968; Tomasello, 1999) and review articles (e.g., Bandura, 1965; Flanders, 1968) have been dedicated to the phenomenon. Recently, there has been a renewed interest in the topic (Hurley & Chater, 2005a, 2005b; Meltzoff & Prinz, 2002; Rogers & Williams, 2006), primarily stimulated by cognitive studies into imitative motor behavior (e.g., Brass, Bekkering, Wohlschläger, & Prinz, 2000; Prinz, 2002), and neuropsychological research into so-called "mirror neurons" (e.g., Iacoboni, Woods, Brass, Bekkering, Mazziotta, & Rizzolatti, 1999; Rizzolatti, Fogassi, & Gallese, 2001). This has even led some scholars to speak of a "wildfire of interest in imitation" (Rogers, 2006, p. 4).

Imitation in general refers to some extent of matching in behavior between a model and an observer as a result of the observer's exposure to the model's behavior (Baer, Peterson, & Sherman, 1967). Remarkably, though, there is little consensus on a more precise definition (Hurley & Chater, 2005a, 2005b). As a

consequence, some scholars tend to include "*mimicry*", which is the automatic behavioral duplication of an observed action without understanding its goals (e.g., Chartrand & Bargh, 1999; van Baaren, Horgan, Chartrand, & Dijkmans, 2004; van Baaren, Maddux, Chartrand, de Bouter, & van Knippenberg, 2003). Mimicry has been shown to occur when someone adjusts one's emotions (Hatfield, Cacioppo, & Rapson, 1994), mood (Neumann & Strack, 2000), or behavior (e.g., Bargh, Chen, & Burrows, 1996; Dijksterhuis, Spears, Postmes, Stapel, Koomen, van Knippenberg, & Scheepers, 1998) to that of other people without being aware of it. It has been argued, though, that a limitation of research into mimicry may be that the term imitation is used rather loosely: instead of measuring imitation, scholars tend to refer to conditions under which people non-consciously adjust their behavior to their social environment (Dijksterhuis, 2005).

In imitation research, in contrast, the dominant view is to distinguish copying without a purpose from goal-directed imitation (Bandura, 1971; Prinz & Meltzoff, 2002; Tomasello, 1999; Tomasello et al., 1993). From that perspective, some use the notion of "*mimesis*" – which was initially used by Aristotle to formulate his artistic ideas on an *imitatio naturae* (Ackerman, 2002) – to cover the phenomenon of deliberate behavioral duplication of observed motor actions for general communicative purposes (Donald, 2005). A well-documented example is Charles Darwin's first contact with the people of Tierra del Fuego that turned out excellent mimics of the crewmen's speech and bodily gestures (Taussig, 1993). Others define imitation in terms of "*true imitation*", which is the (near) complete reproduction of a directly observed and novel action (e.g., Pepperberg, 1999). Others, still, perceive copying behavior in terms of "*selective imitation*", which refers to goal-directed behavior, in which someone does not just copy the observed behavior, but also comes up with modifications (e.g., Carpenter, Call & Tomasello, 2002; Meltzoff, 1988, 1995; Prinz & Meltzoff, 2002; Tomasello, 1999;

Tomasello, Kruger, & Ratner, 1993; Whiten et al., 2004). Interestingly, in all these approaches, copying the observed behavior of others is regarded as an intentional and goal-directed action.

Unfortunately, there is hardly any research into imitation in creative task performance, largely due to the fact that the vast bulk of creativity researchers tend to diametrically oppose imitation to creativity (e.g., Amabile, 1996; Runco, 1994; Smith et al., 1995; Sternberg, 1999). Consistent with everyday understandings of the subject, imitation is usually perceived as "not genuine or real", "artificial and inferior", or "a copy that is presented as the original" (Webster's Online Dictionary, 2006), whereas creativity is mostly understood as "relating to or involving the use of imagination or original ideas in order to create something" (The Concise Oxford English Dictionary, 2006). Most scholars thus regard ideas and products as creative only if they "are unique relative to other ideas currently available" (Shalley, Zhou, & Oldham, 2004, p. 934; see also Amabile, 1996; Mumford & Gustafson, 1988; Sternberg & Lubart, 1999). Admittedly, some have gone so far as to suggest that exemplars of other's performance may serve as guidelines for appropriate creative behavior (Estes & Ward, 2002; Marsh, Landau, & Hicks, 1996; Shalley & Perry-Smith, 2001). Nonetheless, it is common practice to consider too heavily a reliance on exemplars of other's creative performance in terms of "design fixation" (Jansson & Smith, 1991; Shalley & Perry-Smith, 2001; Smith et al., 1993), or as a less effortful "path-of-least-resistance" (Ward, 1995; Ward, Patterson, & Sifonis, 2004).

Remarkably, this particular perspective on imitation and creativity still reflects traditional (late 18th and 19th century) readings of these concepts. In the romantic period, which emerged in the middle of the 18th century, the creative act was understood in terms of ongoing progress – which meant that a creative act should be radically novel and as far removed from the past and from classic

examples as possible (Luhmann, 1995). Along such lines, the general phenomenon of imitation was ideologically understood as a low-level ability characterized by irrationality (van Ginneken, 2003). As described in Rook (2006), imitation was understood as a sort of social hypnosis or "social somnambulism" (Tarde, 1903, p. 84) in which people get involved in crowd actions "in mental unity" (Le Bon, 1895, p. 23). Galef (2005) argues that besides being specific for masses, imitation was thought to also occur among women, children, savages, mentally impaired and animals who were all supposed to have little ability to reason (but see Thorndike, 1898). Simultaneously, creativity and creative problem-solving increasingly came to be understood as being much more rationally demanding, and, therefore, the domain of men. In the behavioral sciences, imitation was thus perceived as a form of mindless and inferior behavior, whereas creativity understood in terms of deliberateness and goal-directedness. In the age of modernism (at the end of the 19th and the beginning of the 20th century), for instance, this idea was even taken further with the invention of the idea of an "avant-garde" to capture those artists who produced the most experimental or radically novel output (e.g., Greenberg, 1961). Thus, this particular view on the relation between imitation and creativity in creative task settings remained very influential in the judgment of creative performance.

Summarizing, because imitation in creative task performance is almost by definition contingent on the performance of others, while creativity refers to ideas that "are unique relative to other ideas currently available" (Shalley et al., 2004, p. 934), copying exemplars of the creative performance of others tends to be perceived as a constrained or poor manifestation of creative behavior (Smith et al., 1995). As a result, not much attention has been given to issues such as how to define the subject of imitation in general, or to even consider the possibility that

imitation could play a particular role in creative task performance. Such issues will, therefore, be addressed in the next section.

Imitation in Creative Task Performance

In the previous section, it was reasoned that the study of imitation in creative task settings is virtually non-existent due to a biased understanding of the subject in rather outdated scientific and everyday terms. In this section, it will be claimed that a reading of imitation in terms of selectivity offers a more adequate tool for explaining and understanding imitative behavior in creative task performance.

In the literature, the study of one-on-one – or "true" – imitation is not entirely beyond dispute (Hurley & Chater, 2005a, 2005b; Meltzoff, 1988). Besides, it has been argued that an understanding of copying behavior in terms of selectivity seems much more applicable to the study of potentially creative behavior (Harris & Want, 2005; Want & Harris, 2001). In this light, imitation is treated as intentional and goal-directed behavior, in which someone does not just copy the observed behavior, but also selectively comes up with modifications (Carpenter et al., 2002; Meltzoff, 1988, 1995; Prinz & Meltzoff, 2002; Tomasello, 1999; Tomasello et al., 1993; Whiten et al., 2004). The novelty-generating potential underlying imitation has repeatedly been shown for animals (e.g., Pepperberg, 1999; Whiten, 1998; Zentall, 2001; Zajonc, 1965), infants (e.g., Meltzoff, 1988, 1995; Meltzoff & Moore, 1977), and school-age children (e.g., Bandura, Ross & Ross, 1963a, 1963b; Miller & Dollard, 1941). Even though there is hardly any research into imitation in creative task performance it stands to reason that this potential also holds for this particular type of human behavior.

For the study of imitation in creative task performance, however, the notion of selective imitation seems to contain a paradox – essentially because a modification will always to some extent resemble bits and pieces of the observed behavior, but also incorporate a novel quality relative to this modeled behavior. In other words, modifications stemming from imitative processes are, per definition, of moderate rather than radical novelty (Meltzoff, 1988; Tomasello, 1999; Tomasello et al., 1993). Thus, in a line of research in which the dominant practice is to conceptually define creative behavior in terms of the extent to which a product or idea deviates from what has been done before (e.g., Amabile, 1996; Shalley et al., 2004), the relation between imitation and creativity almost by definition is a negative one – that is, the more someone copies a creative exemplar, the less creative someone turns out to be. Nonetheless, this may not necessarily and always be the case. For instance, in creative task settings in which the aim is not so much to come up with a single creative product or idea but with a vast array of ideas that could be used for further exploration, as is common in brainstorming techniques (e.g., Osborn, 1963), creativity tends to be defined in terms of quantity – that is, the more ideas one produces, the more creative one will be (e.g., Diehl & Stroebe, 1987; Parnes & Meadow, 1959). In such settings, imitation of an exemplar of another's successful creative performance may positively influence creativity, because the exemplar may serve as a guideline for appropriate creative behavior, and hereby may provide a means to generate a larger number of creative ideas.

There exists much anecdotal evidence suggesting that creative professionals' engagement with the performance of others in creative task settings may at times produce something desirable. Interestingly, art historical studies indicate that in antiquity and the Renaissance, the concept of *imitatio* was central to understanding the arts and letters, whereas the concept of *creatio* was not at all

applied to the activities of creative professionals (Panofsky, 1960). In those times, not only the Aristotelian concept of imitation as *mimesis*, which referred to an imitation of nature, but also the idea of copying the works of canonical masters of the past were seen as drivers for artistic development (Ackerman, 2002; Reckermann, 1993). Also in the post-modern era of the last decades, however, the concept of imitation has widely been applied to those instances of artistic, literary and intellectual creativity in which open reliance upon the works of predecessors result in profound alterations and innovations (Ackerman, 2002; Boehm, 1996; Honour & Fleming, 1991). Thus, many acclaimed masterpieces are so-called "copies that are no copies" – that is, they possess autonomous creative qualities due to the fact that they are not entirely faithful replications of an example (Taussig, 1993, p. 52). For instance, the oeuvre of an acknowledged master such as Pablo Picasso illustrates that openly relying upon others' creative inventions can breed artistic success (Cowling, 2002a, 2002b; Daix, 1993). More extremely, the key works of eminent artists such as Marcel Duchamp, who presented ready-made objects as works of art (Tomkins, 1998), Andy Warhol, who gained fame by (among other things) exhibiting Brillo Boxes taken straight from the supermarket (Danto, 1964), or Gerhard Richter, who painted 1-on-1 copies of photographs on canvas (Obrist, 1995), show that professional artists can build a renowned oeuvre even around perfectly *un*original output.

Many biographies of creative professionals in the artistic domain thus seem to suggest that people do not necessarily need to come up with a purely novel response in order to solve a creative problem. This observation is also confirmed for organizational creativity (i.e., design and engineering) within creative industries through cases of successful inventors such as Thomas Edison and his laboratory (Hargadon & Douglas, 2001) and award-winning contemporary global design teams such as IDEO (Hargadon, 2002; Hargadon & Sutton, 1997;

Sutton & Hargadon, 1996). These examples – again – illustrate that individuals working in creative domains often perform creative tasks through imitation of relevant product features (e.g., Dahlin & Behrens, 2005; Lieberman & Asaba, 2006; Schulz, 2001). It has, therefore, been argued that copying others' performance is in general considered very beneficial for the diffusion of novel ideas, opinions, and products throughout society (e.g., Henrich, 2001; Henrich & Gil-White, 2001; Tomasello et al., 1993). It thus stands to reason that the generation of more in-depth knowledge of the processes underlying imitation in creative task performance thus is an essential part of understanding – and ultimately managing – creativity and innovation.

Importantly, the anecdotal evidence in artistic and organizational practice suggesting that people always have the possibility to focus on the performance of others in order to satisfactory fulfill a creative task may challenge a core assumption underlying creativity research – that the creative act is determined by the extent of novelty in generated output. A bold statement in creativity research such as: "[c]reativity [...] is usually thought to include only the truly novel; there is no argument as to the novelty" (Mandler, 1995, p. 11), may not necessarily be true given that the creative act is not performed by a person in a social vacuum, but in an environment rich of exemplars of the creative performance of others. Interestingly, it has recently been suggested that creativity may not be a unidimensional construct based upon novelty alone (Cropley, 2006; Kim, 2006). Creative task performance may, instead, well consist of several types of creative behavior that fundamentally differ from each other according to specific settings and motivational requirements of creative tasks (Unsworth, 2001). This seems to add even more fuel to the assumption that imitation in creative tasks must be regarded as a component of creative task performance largely influenced by the performance of others in the environment, which sometimes negatively, but other

times positively influences creative behavior, depending on the requirements of the task at hand.

To summarize, perceiving imitation as intentional and goal-directed behavior in which someone does not just copy the observed behavior, but also selectively comes up with modifications, enables an adequate appraisal of instances in which people do not necessarily need to come up with a purely novel response in order to solve a creative problem. Anecdotal evidence in artistic and organizational practice confirms that imitation, despite the fact that products and ideas stemming from imitative processes are per definition of moderate rather than radical novelty, thus is an essential part of creative task performance and of creativity and innovation in general.

Overview of the Dissertation

In the previous section, a theoretical framework for the study of imitation in creative task performance was developed. Notwithstanding anecdotal evidence from the history of fine arts and literature on imitation in management research, there was hardly any supporting empirical research into psychological determinants and motivational underpinnings of imitation in creative tasks. It stands to reason, though, that imitation is an element of creative task performance, which differs from creativity in its reliance on exemplars of others' creative performance, and is worthwhile further investigating in greater detail.

In this dissertation, therefore, a series of four laboratory experiments will be reported to test some assumptions underlying the study of imitation in creative task performance. For the first three studies, a creative construction task was developed in which participants needed to actually generate and produce their design in the presence of an exemplar of another's creative performance. For the

fourth study, an established creative idea generation task (Friedman & Förster, 2001, 2005) was modified so as to enable exploration of the influence of exemplars of other's creative performance on the generation of solutions for a creative problem. The experimental setting created an opportunity to draw conclusions concerning causality and to employ relatively objective behavioral measures of imitation, as it gave us full control over what participants could observe of another's creative performance, and of the extent to which they did or did not rely upon those observations in their endeavors.

In chapter 2, the central aim was to establish the viability of a social comparison framework to understand imitation in creative tasks. Based upon evidence in the social comparison literature that people are often likely to compare their performance with those of others (e.g., Collins, 1996, 2000), and that people tend to make comparisons in uncertain task settings (e.g., Buunk, 1994, 1995), two studies were conducted to explore the influence of these factors on imitation in creative tasks. In addition, a measure of individual differences in one's comparison orientation for abilities (COA) (Gibbons & Buunk, 1999) was included in the design to further confirm the core assumption underlying this chapter that imitation in creative task performance is a phenomenon driven by social comparison.

In chapter 3, the central aim was to explore the motivational underpinnings of imitation in creative tasks. Based upon suggestions in the literature that people in general tend to differentially rely upon the quality of other's performance depending on particular situational settings (e.g., Buunk, Collins, Taylor, Van Yperen, & Dakof, 1990; Lockwood, 2002; Lockwood, Jordan, & Kunda, 2002; Lockwood & Kunda, 1997, 1999) and suggestions that reliance upon others' performance in creative task performance is motivationally embedded – that is, influenced by differences in one's self-regulatory focus on

promotion or prevention (Crowe & Higgins, 1997; Friedman & Förster, 2001, 2005; Higgins, 1997), a third study explored the influence of these factors on imitation in creative task performance.

In chapter 4, the central aim was to more specifically explore differences in self-regulatory focus and characteristics of exemplars in the setting of idea generation. Based upon evidence in the literature (Crowe & Higgins, 1997; Friedman & Förster, 2001, 2005; Higgins, 1997) and generated in the previous studies for the role of differences in promotion and prevention focus in creative task performance, combined with suggestions in the literature that the way in which creative exemplars are presented (in terms of abstraction or specificity) influence the extent to which people pay attention to those exemplars (Ward, 1994; Ward et al., 2004), the fourth and final study reported in this dissertation explored the influence of these factors on imitation in an idea generation task.

In chapter 5, finally, the results of these four studies are summarized and integrated in a conclusion. Further, a general discussion on the study of imitation in creative task performance is combined with a thorough specification of the strengths and weaknesses of the present research, so as to provide the reader with practical implications, and with possible similar and related avenues for future research into this phenomenon.

2.

Imitation in Creative Task Performance: Effects of Performance of Other, Task Difficulty, and Social Comparison Orientation

Performing creative tasks through imitation of relevant product features is common practice for individuals working in creative domains. Imitation seems to be a component of creative task performance, not unequivocally undermining creativity, and largely influenced by others' performance. This leads us to expect that social comparison theory offers a viable framework for analysis of imitation in creative performance settings. Therefore, in the present study we expected people in creative tasks to imitate high (vs. low) performance of other more, and to imitate others' performance more in difficult (vs. simple) creative tasks. Moreover, we expected these main effects to be moderated by social comparison orientation. We tested these predictions in two experiments allowing us to incorporate relatively objective behavioral measures of imitation and creativity. Results generally supported predictions, indicating that imitation indeed is a comparison-driven component of creative task performance.

Introduction

Performing creative tasks through imitation of relevant product features is common practice for individuals working in creative domains (e.g., Dahlin & Behrens, 2005; Lieberman & Asaba, 2006; Schulz, 2001). In those domains, innovation often stems from processes of cross-fertilization among designers and/or engineers as a result of which newly developed technologies, products, and ideas clearly resemble existing models (Hargadon, 2002; Hargadon & Sutton, 1997). Research in innovation diffusion, for instance, shows that the spread of novel ideas, opinions, or products throughout society benefits from copying the performance of others (e.g., Henrich, 2001; Henrich & Gil-White, 2001). This indicates that an understanding of the processes underlying imitation in creative task performance thus is an essential part of understanding – and ultimately managing – creativity and innovation.

Research so far has pointed to sociological (e.g., Abrahamson & Rosenkopf, 1993, 1997) and economic (e.g., Apesteguia, Huck, & Oechssler, 2003; Rogers, 2003; Valente, 1995) effects on innovation diffusion. There is, however, a strong need to also take psychological mechanisms into account (Rook, 2006). However, little knowledge exists about psychological determinants of imitation in creative settings. One important reason might be that the majority of psychological research into imitation has been conducted from comparative (e.g., Tomassello, Savage-Rumbaugh, & Kruger, 1993), developmental (Meltzoff & Prinz, 2002), and social learning points of view (e.g., Bandura, 1971, 1977; Miller & Dollard, 1941). Moreover, most psychological research into creativity has been framed in terms of a distinction between creativity vs. constraints to creativity (Smith, Ward, & Finke, 1995), in which the influence of models in creative tasks is understood accordingly (Jansson & Smith, 1991; Shalley & Perry-Smith, 2001;

Smith, Ward, & Schumacher, 1993). As a result, scholars in imitation and creativity research have up till now largely ignored imitation in creative tasks.

Nonetheless, research into the determinants of imitation in creative tasks is highly relevant, especially for those working in organizations dealing with innovation diffusion. People must, for instance, be willing to take risks in adopting new ideas, products, or technologies (Smith, Collins, & Clark, 2005). It has been shown that one way to regulate possible risk is through processes of comparison with others (Kruglanski, Thompson, Higgins, Atash, Pierro, Shah, & Spiegel, 2000). However, comparisons with others have been shown to lead to some extent of imitation between model and observer (Berger, 1971, 1977). This leads us to expect that social comparison may also set the stage for imitation on creative tasks. Social comparison theory (Festinger, 1954) has generated much evidence that people are more likely to compare their performance with that of well-performing others. It has also been shown that people tend to make comparisons in uncertain task settings. By exploring the influence of factors such as performance of others and task difficulty we may thus prove the viability of a social comparison framework to understand imitation in creative tasks.

Therefore, in the present study our objectives were twofold. First, we intended to establish the viability of a social comparison framework as a means of understanding imitation in creative tasks. Second, we sought to demonstrate that imitation is a separate component of creative task performance, which differs from creativity in its reliance upon performance of others. In doing so, we aim to provide a conceptual and empirical starting point for the study of imitation in creative task performance, and to put the study of imitation in creative task performance more firmly on the agenda of research in creativity and innovation.

Imitation and Creative Performance

Imitation is a widespread cultural phenomenon, largely due to the fact that human beings are "the most imitate creatures on the planet" (Prinz & Meltzoff, 2002, p. 1). It is one of the oldest topics in psychological research (e.g., Le Bon, 1895; Tarde, 1903), and several edited volumes (e.g., Bandura, 1971; Meltzoff & Prinz, 2002; Simmel, Hoppe, & Milton, 1968) and review articles (e.g., Flanders, 1968) have been dedicated to the phenomenon. Recently, there has been a renewed interest in imitation (Hurley & Chater, 2005a, 2005b), resulting from cognitive studies (e.g., Brass, Bekkering, Wohlschläger, & Prinz, 2000; Prinz, 2002), and neuropsychological research into so-called "mirror neurons" (e.g., Iacoboni, Woods, Brass, Bekkering, Mazziotta, & Rizzolatti, 1999; Rizzolatti, Fogassi, & Gallese, 2001).

Even though there is little consensus on a general definition (Hurley & Chater, 2005a, 2005b), the dominant view is to distinguish copying without a purpose (i.e. mimicry) from goal-directed imitation (Bandura, 1971; Prinz & Meltzoff, 2002). Imitation, therefore, is goal-directed behavior consisting of a means/ends structure, in which someone does not just copy the observed behavior, but also understands a model's goals and/or intentions, and is capable of coming up with modifications of the observed behavior (Meltzoff, 1995; Prinz & Meltzoff, 2002). This novelty-generating potential of imitation has repeatedly been shown for animals (e.g., Pepperberg, 1999; Whiten, 1998; Zentall, 2001; Zajonc, 1965), infants (e.g., Meltzoff, 1988, 1995; Meltzoff & Moore, 1977), and school-age children (e.g., Bandura, Ross & Ross, 1963a, 1963b; Miller & Dollard, 1941). Remarkably, there is hardly any research into imitative adult behavior (Brass, Bekkering, & Prinz, 2001; Stürmer, Aschersleben, & Prinz, 2000), or on imitation in creative task performance. It seems reasonable, though, to assume that the novelty-generating potential of imitation also holds for creative task performance.

Unfortunately, however, most creativity research seems instead to be influenced by the everyday understanding of imitation as "not genuine or real", "artificial and inferior", or "a copy that is presented as the original" (Webster's Online Dictionary, 2006). Thus, in creative settings imitation is usually misunderstood for a constrained or poor manifestation of creative behavior – in other words, for a copy presented as the original (e.g., Jansson & Smith, 1991; Shalley & Perry-Smith, 2001; Smith et al., 1993). In doing so, one overlooks that in creative task performance people do not necessarily need to come up with a purely original response in order to solve a creative problem. Anecdotal evidence of successful inventors of past (Hargadon & Douglas, 2001) and present (Hargadon, 2002; Hargadon & Sutton, 1997) seems to suggest that people always have the possibility to focus on the performance of others in order to satisfactory fulfill a creative task. Thus, imitation in creative tasks must not be regarded as inversed creativity, but as a separate component of creative task performance largely influenced by the performance of others in the environment.

The fact that imitation is by definition contingent on the observation of others' performance, leads us to expect that social comparison theory offers a viable framework for the analysis of imitation in creative performance settings. Social comparison theory posits that human beings have a drive to evaluate their abilities and opinions. If objective means to evaluate abilities and opinions are not available, people tend to make comparisons with others (Festinger, 1954). In creative task settings, exposure to another's creative performance may invite social comparisons. Because imitation refers to some extent of matching in behavior between a model and an observer as a result of the observer's exposure to the model's behavior (Hurley & Chater, 2005a, 2005b), social comparison might thus set the stage for imitation in creative tasks. Surely, social comparisons do not automatically lead to imitation of the performance of others. They could also lead

to the opposite if performance evaluations work out badly for the model. But it seems reasonable to assume that, in general, comparisons with the creative performance of others increase the likelihood for imitation to occur.

Therefore, we may explore imitation on the basis of well-established findings from the social comparison framework. By focusing on factors whose relationship with social comparison processes are in a way "beyond dispute", and relating these factors to imitation in creative tasks, we bolster confidence in the conclusion that their observed influence is indeed grounded in social comparison processes. Research on social comparisons has, for instance, yielded many findings on the fact that people tend to compare their personal abilities with the performance of well-performing others in their environment. Also, much evidence exists for the fact that people tend to compare with others especially in more ambiguous situations. Factors such as the quality of performance of others and task difficulty should thus influence imitation in creative task performance. In addition, research in social comparison has acknowledged that the influence of such factors is stronger for people that are more prone to social comparison. By exploring the influence of these factors in the present study, therefore, we may establish the viability of a social comparison framework to understand imitation in creative tasks.

People do not just compare with anyone that is available; some referents are seen as more relevant comparison others. It has been argued that successful models might serve as a learning device for people to understand the most appropriate or successful behavioral acts, standards and/or solutions given the circumstances (Bandura, 1986). It has repeatedly been shown for school-age children that direct observation of the aggressive behavior of a successful model leads to imitation of this model (Bandura, Ross, & Ross, 1963a, 1963b). This effect is so strong, that people even show imitation of deviant or prohibited

behavior as long as the model is perceived as having high status (Lefkowitz, Blake, & Mouton, 1955; Walters & Parke, 1964). If people in a creative task observe the product of a high performing other on the same task, it thus seems reasonable to expect that they will not only compare with the referent, but also to some extent imitate the referent's performance. Therefore, our first hypothesis is:

> *Hypothesis 1:* Observation of the creative product of a high performing other leads to more imitation than observation of the product of a low performing other.

Research in social comparison further indicates that in highly uncertain and stressful situations, people show a tendency to affiliate with other people in the environment in order to evaluate their own behavior (Schachter, 1959). More specifically, uncertainty and stress stimulate a need to collect information on what other people think (Gordon, 1966) and how they perform (Hakmiller, 1966; Jones & Regan, 1974; Singer & Shockley, 1965). Further research has confirmed the importance of uncertainty and stress in social comparison processes (e.g., Buunk, 1994; Buunk, 1995; Buunk & Ybema, 1997; Molleman, Pruyn, & van Knippenberg, 1986). These factors also play a crucial role in performance-based and competitive situations, in which people who are uncertain about their performance seek to compare with others (Conolly, Gerard, & Kline, 1978; Ruble & Frey, 1991). Accordingly, it can be assumed that people will compare their own creative performance with that of others. Because social comparisons set the stage for imitation, we predict that difficult creative tasks will not only stimulate comparison acts, but also imitative behavior. Therefore, our second hypothesis is:

> *Hypothesis 2:* A difficult creative task leads to more imitation than a simple creative task.

If imitation in creative tasks indeed involves social comparison processes, they should be moderated by comparison orientation for abilities (COA). Research

in social comparison has recently acknowledged the moderating role of individual differences in social comparison orientation, "the personality disposition of individuals who are strongly orientated to social comparison, who are strongly interested in their own standing relative to others, and who are interested in information about others' thoughts and behaviors in similar circumstances" (Buunk & Brenninkmeijer, 2001, p. 538). To assess these individual differences, Gibbons and Buunk (1999) developed the Iowa-Netherlands Comparison Orientation Measure (INCOM). The authors showed that social comparison orientation is correlated to variables reflecting a tendency towards conformity and other orientation, such as the Public Consciousness Scale (Fenigstein, Scheier, & Buss, 1975) and the Attention to Social Comparison Information Scale (Bearden & Rose, 1990). The INCOM measure consists of two separate factors, comparison orientation for opinions and comparison orientation for abilities, which are highly related. These subscales can be used jointly or separately (Gibbons & Buunk, 1999).

Laboratory studies have shown that people high in comparison orientation are to a greater extent engaging in social comparison than those lower on the scale (Gibbons & Buunk, 1999; Michinov & Michinov, 2001). Various field studies confirm that people with a high (vs. low) comparison orientation select more information about others (Van der Zee, Oldersma, Buunk, & Bos, 1998). Also, they more readily engage in comparisons with upward targets (Buunk, Zurriaga, Peíró, Nauta, & Gosalvez, 2005). Therefore, in a creative performance task, people high on comparison orientation should have a greater tendency to evaluate their own abilities with the abilities of well-performing others. This may be expected to result in stronger effects of performance of others for people high on COA as compared with people low on COA:

Hypothesis 3: The effect of performance of others on imitation in creative task performance is stronger for people with high COA than for people with low COA.

Creative tasks are open-ended, meaning that people have to deal with the uncertainty that there are no clear and straightforward solutions toward a problem (Amabile, 1996). It can thus be expected that in creative settings, especially people who are high on COA will make more comparisons when the task is difficult than when the task is simple. Interest in reducing this task uncertainty leads to performance comparisons, and a greater likelihood for the occurrence of imitation. Therefore, our fourth hypothesis is:

Hypothesis 4: The effect of task difficulty on imitation in creative task performance is stronger for people with high COA than for people with low COA.

These hypotheses were tested in a laboratory experiment, for which we developed a creative construction task in which participants, as opposed to creative idea generation tasks (e.g., Friedman & Förster, 2001; Shalley & Perry-Smith, 2001) needed to actually realize their design in practice. The main advantage of an experimental setting is that it enabled us to draw conclusions concerning causality, and to employ relatively objective behavioral measures of imitation, as it gave us full control over what participants could observe of the performance of others. We also sought to show that imitation is not necessarily the inverse of creativity. Even though it was not the purpose of the present paper to investigate the relation between imitation and creativity, in anticipation of a possible interest in this relation we also incorporated a measure of creativity. We did not expect to find any influence of the performance of others on creativity, though.

Preliminary Study

In order to develop our paradigm, we first conducted a preliminary study to examine the base rate effects of our manipulations. There is some recent evidence in the literature on creativity that people tend to conform to creative examples, no matter how good or bad, because the mere presence of an example causes fixation in the generation of creative ideas (Jansson & Smith, 1991; Smith et al., 1993). This suggests that in a creative task setting, people will always assimilate a referent's creative performance to some extent. Thus, a creative act in the presence of the exemplar of a high-performing other should lead to much imitation, but also a creative act in the presence of the exemplar of a low-performing other should still lead to more imitation than a creative act in the absence of an exemplar. Therefore, we included a control group without an exemplar in the preliminary study. Although, strictly speaking, imitation is not possible in this condition, imitation scores would serve as a base rate to determine whether comparisons with low performing others lead to assimilation or not.

For the experiment, we developed a creative construction task, in which participants were asked to build a creative object with Lego™. Construction tasks have successfully been used before for analysis of individual and group performance. Our task was inspired by construction tasks by Moreland and Myaskovsky (2000), Tschan (1995), and Weingart (1992). Perhaps as homage to the earliest researchers of imitation that studied the relation between an observer and a work of art (Lipps, 1903), in our paradigm, participants were invited to build a 3D art object. They were either provided with an exemplar object or not, depending on the experimental condition. We note that while constructing the object participants did not actually observe the other, but the product of their performance. Since we intended to study imitation of product features, this was sufficient for the occurrence of imitation.

In this study, imitation was conceptually defined as similarity of product features in creative performance resulting from observation of the creative product of another participant. Imitation was rated by two independent raters who were blind to the objectives of the experiment. Each was instructed to score the amount of similarity of the exemplar object and the object created by the participant based on the shared number of formal characteristics. We developed two exemplar objects, one for the simple and one for the difficult task condition. The simple exemplar object consisted of the following formal characteristics: (1) it was built on a platform; (2) which was raised in a specific way; (3) the exemplar object was composed of an inner and an outer part; (4) the interior part was built from separate rails of a railway track; (5) that were stacked up; (6) vertically; (7) and crosswise; (8) the exterior part was composed of straight architectural columns; (9) the object had a tower piece. For the difficult task condition, this exemplar object was extended with the following additional features: (10) the notable and purely symmetrical usage of rooftop pieces; (11) at the end of each train rail; (12) the fences on top of such rooftop pieces; (13) and the strict separation of colors. For both conditions, the scores for the number of overlapping formal features were combined in an overall score on a 7-point scale for imitation ranging from 1 (*not at all*) to 7 (*very much so*).

In this study, creativity was conceptually defined as product novelty in creative performance. Creativity was again rated by two independent raters who were blind to the objectives of the experiment. Each was instructed to score the amount of novelty in the object created by the participant based on the extent to which application of pieces in given categories deviated from their standard usage. More specifically, in the simple task condition, the object consisted of pieces in the following categories: (1) platform pieces, (2) railway tracks, and (3) bricks. For the difficult task condition, the object in addition consisted of pieces in the

following categories: (4) roofing tiles, and (5) fences. For both conditions, the scores for each application were summed up and divided by the total number of categories so as to come up with an overall score for creativity.

This experimental set-up enabled us to measure imitative behavior and creativity with a relatively high degree of objectivity.

Method

Participants and Design

Two hundred twelve business students (156 men and 56 women; *M* age = 19.03 years, *SD* = 1.59) were paid €10 (approximately US$ 12) for their participation. The data from 4 participants were excluded from analyses because they were unable to finish their task in the time given. Participants were randomly assigned to the conditions of a 2 (Task Difficulty: low, high) X 3 (Performance of Other: control, low, high) factorial design.

Experimental Procedure

Participants were led into the laboratory room by the experimenter and seated at a desk. Except for the control conditions, on this desk, next to a closed box and an instruction leaflet, a 3D Lego™ object was prominently exhibited. Participants were instructed that they would participate in a construction task with the purpose of investigating new ways of stimulating organizational performance. Each participant was invited to build a 3D scale model of an art object to be placed in the new building of the school. Participants were instructed that their 3D scale model should be constructed by means of pieces of Lego™ which were to be

found in the closed box on their desks. After finishing the construction task, each participant filled out a questionnaire assessing manipulation checks.

Manipulation of Task Difficulty. Each participant was asked to build a 3D object in 45 minutes. In the simple task condition, participants were given a limited number of pieces (N = 174). In addition, they were informed that 45 minutes was sufficient to perform the task. In the difficult task condition, participants were given a greater number of pieces (N = 238). In addition, they were informed that 45 minutes was hardly sufficient to perform the task.

Manipulation of Performance of Other. In the experimental conditions, participants continuously faced a prominently exhibited 3D exemplar object during the construction task. In the low Performance of Other condition, participants were told that a previous participant made this object, and performed poorly according to a team of experts. In the high Performance of Other condition, participants were told that a previous participant made this object, and performed well according to a team of experts. In the control condition, there was no exemplar object present.

Dependent Measures

In this study, imitation was understood as similarity of product features in creative performance of a participant that resulted from his of her observation of the creative product of another participant. The amount of similarity of the exemplar object and the object created by the participant was based on the number of shared formal characteristics. In the simple task condition, striking characteristics of the exemplar object were: a raised platform, the clear distinction between an inner and outer space, the inner space consisting of vertically and crosswise stacked up train rails, the outer space consisting of straight columns, and a tower piece. For the difficult task condition, additional features were: the notable

and purely symmetrical usage of rooftop pieces at the end of each train rail, the fences on top of such rooftop pieces, and the strict separation of colors. For each condition, this allowed us to determine a score for the number of overlapping formal features. We note that because of a greater range of features, the difficult task condition possibly generated a higher score than the simple task condition. Therefore, for each condition, the score was converted into an overall score on a 7-point scale for imitation ranging from 1 (*not at all*) to 7 (*very much so*). These judgments of similarity were provided by two independent raters (Inter Rater Correlation $r = .85$).

In this study, creativity was understood as the extent to which a product of the creative performance of a participant was novel. The extent to which participants applied platforms, railways, bricks, roofing tiles, and fences in a manner which clearly deviated from their everyday usage determined the amount of creativity of the object. In the simple task condition, striking characteristics of creativity were: application as a wall or a sweep (for the category platform pieces), application as airplane wings or a ski jump (for the category railway pieces), application as irregular ornament or onion-shaped decoration (for the category brick pieces). For the difficult task condition, additional characteristics were: application as wave motion pattern (for the category roofing tile pieces), and finally, application as decoration under divergent angle (not 45°/90°) (for the category fences). The sum of generated novelty per category was divided by the total number of categories per condition to allow us to determine an overall score for creativity. These judgments of novelty were provided by two independent raters (Inter Rater Correlation $r = .92$).

In this study, imitation and creativity were to a limited extent correlated ($r = -.37$, $p < .01$). This is not surprising, given that both imitation and creativity are

theoretically in part defined by novelty. It furthermore indicates that imitation and creativity are not each others' perfect inverse, but clearly differ from each other.

Aside from the measure of imitation, all responses were assessed on a 5-point scale ranging from 1 (*not at all*) to 5 (*very much so*).

Manipulation Checks

To test whether the manipulation of Performance of Other was successful, we used nine items that among others asked participants to what extent "they believed that the participant who made the exemplar object performed well", and "they believed that the participant who made the exemplar object came up with an original product" (Cronbach's α = .98). The Performance of Other manipulation check was not administered in the control condition. To test whether the manipulation of Task Difficulty was successful, we used twelve items that among others asked participants to what extent "they knew what piece of work they wanted to build, when they were already working on the assignment for a considerable time period", and to what extent "they had much time to build what they wanted" (Cronbach's α = .83).

Results

Manipulation Checks

A 3 (Performance of Other: control, low, high) X 2 (Task Difficulty: low, high) analysis of variance on the manipulation check for Performance of Other showed a significant main effect of Performance of Other, F (1, 136) = 61.32, p < .001, η^2 = .31. The high performance of the previous participant was indeed observed as higher (M = 3.84, SD = .58) than the low performance of the previous

participant (M = 2.99, SD = .69). For obvious reasons, we did not measure the effect of Performance of Other for the control condition. No other significant effects were found.

An analysis of variance on the manipulation check for Task Difficulty showed a significant main effect of Task Difficulty, F (1, 202) = 22.51, p < .001, η^2 = .10. A difficult task was indeed observed as more difficult (M = 3.12, SD = .65) than a simple task (M = 2.67, SD = .68). No other significant effects were found.

We could therefore conclude that the manipulations were successful.

Imitation

As expected, an analysis of variance on imitation showed a significant main effect for Performance of Other, F (2, 202) = 29.12, p < .001, η^2 = .22. Participants showed more imitation in the high Performance of Other condition (M = 3.71, SD = 1.43) than in the low Performance of Other condition (M = 3.21, SD = 1.49) and in the control condition (M = 2.10, SD = .88).

An additional contrast analysis indicated that participants indeed showed more imitation in the high Performance of Other condition than in the control condition, F (1, 204) = 56.14, p < .001. Also, participants showed more imitation in the low Performance of Other condition than in the control condition, F (1, 204) = 26.55, p < .001. Finally, participants showed more imitation in the high Performance of Other condition than in the low Performance of Other condition, F (1, 204) = 5.56, p < .02. This confirmed Hypothesis 1.

As expected, also a significant main effect for Task Difficulty, F (1, 202) = 15.72, p < .001, η^2 = .07, was found. Participants showed more imitation in the high Task Difficulty condition (M = 3.36, SD = 1.37) than in the low Task Difficulty condition (M = 2.67, SD = 1.46). This confirmed Hypothesis 2.

No interaction effect was found, F (2, 202) = .13, p > .85.

Creativity

A significant main effect for Task Difficulty, F (1, 201) = 24.96, p < .001, η^2 = .11, was found. Participants showed less creativity in the high Task Difficulty condition (M = 1.11, SD = .66) than in the low Task Difficulty condition (M = 1.66, SD = .89). No other effects were found.

Discussion

The preliminary study confirmed Hypothesis 1 that high Performance of Other leads to imitation in creative tasks, and Hypothesis 2 that Task Difficulty leads to imitation in creative tasks. The addition of a control group in the design made clear that people always to some extent showed imitative behavior when confronted with the performance of others. We also found confirmation for the notion that creativity is not driven by Performance of Other. It was only found that Task Difficulty decreases creativity. This confirmed previous research indicating that in difficult creative tasks, people have to deal with the uncertainty that there are no straightforward solutions toward a problem (Amabile, 1996). More importantly, the preliminary study indicates that social comparison theory could be a viable framework for analysis of imitation in creative task settings. Therefore, we conducted the main study that incorporated COA, the individual-difference measure for comparison orientation for abilities. The reasoning behind this was that if the imitation processes we examined in our preliminary study indeed involved social comparison, they should be moderated by social comparison orientation.

Main Study

In order to replicate the main findings of the previous study, we again tested our Hypotheses 1 and 2. In the Preliminary Study we found that people always display some imitation in the presence of an example. It seemed therefore reasonable to continue in the Main Study with the most relevant levels of the factor Performance of Other (low vs. high), and to drop the control condition from the design for reasons of economy.

Method

Participants and Design

One hundred forty two business and economics students (72 men and 70 women; M age = 20.73 years, SD = 2.32), were paid €10 (approximately US$ 12) for their participation. The data from 2 individuals were excluded from analyses because they were unable to finish the task in the time given. The data from 3 individuals were excluded from analyses because of a striking lack of interest in the task.

The experiment consisted of a 2 (Performance of Other: low, high) X 2 (Task Difficulty: low, high) X 2 (COA: low, high) factorial design. In this design, comparison orientation for abilities (COA) was measured using the Iowa-Netherlands Comparison Orientation Measure (INCOM) (Gibbons & Buunk, 1999). High and low COA groups were created via a median split.

Experimental Procedure

The Main Study followed identical procedures as the preliminary study. The manipulations of Performance of Others and of Task Difficulty were also identical.

Comparison Orientation for Abilities (COA). To assess COA, we used the six item INCOM subscale for COA (Gibbons & Buunk, 1999). Participants were among others asked to what extent "they always paid a lot of attention to how they did things compared with how others do things", "if they wanted to find out how well they had done on something, they compared what they had done with how others had done", and "they often compared how they were socially (e.g., social skills, popularity) with other people" (Cronbach's α = .82). Because a Kolmogorov-Smirnov goodness-of-fit test indicated that the continuous variable for COA did not follow a normal distribution, D (1, 137) = .12, $p < .001$, we decided to create high and low COA groups using a median split. Independent samples t-tests showed that high COA groups indeed scored significantly higher (M = 22.53, SD = 1.62) than low COA groups (M = 17.42, SD = 2.74), t (133) = -12.88, $p < .0001$.

Dependent Measures

The measure of imitation was identical to the Preliminary Study. Again, an external rating was provided by two independent raters (Inter Rater Correlation r = .89). The measure of creativity was also similar to the Preliminary Study (Inter Rater Correlation r = .88). In this study, imitation and creativity were again correlated (r = -.61, $p < .01$). The magnitude of the correlation once more indicates that imitation and creativity are not each others' perfect inverse, but differ from each other. Aside from the measures of imitation and creativity, all

responses were assessed on a 5-point scale ranging from 1 (*not at all*) to 5 (*very much so*).

Manipulation Checks

To test whether the manipulation of Performance of Other was successful, we used six items that among others asked participants to what extent "they considered the exemplar object to be original", and "they were pleased with the quality of the exemplar object" (Cronbach's $\alpha = .85$).

To test whether the manipulation of Task Difficulty was successful, we used seven items that asked participants to what extent "they knew what piece of work they wanted to build, when they were already working on the assignment for a considerable time period", and to what extent "they had much time to build what they wanted" (Cronbach's $\alpha = .83$).

Results

Manipulation Checks

A 2 (Performance of Other: low, high) X 2 (Task Difficulty: low, high) X 2 (COA: low, high) analysis of variance on the observed performance of a previous participant showed a significant main effect of Performance of Other, $F(1, 127) = 78.33$, $p < .001$, $\eta^2 = .38$. The high performance of a previous participant was indeed observed as higher ($M = 1.81$, $SD = .40$) than the low performance of a previous participant ($M = 1.19$, $SD = .39$). No other effects were found.

An analysis of variance on the difficulty of the task showed a main effect of Task Difficulty, $F(1, 127) = 7.25$, $p < .01$, $\eta^2 = .05$. A difficult task was indeed

observed as more difficult (M = 2.73, SD = .70) than a simple task (M = 2.42, SD = .60). No other effects were found.

We could therefore conclude that the manipulations were effective.

Imitation

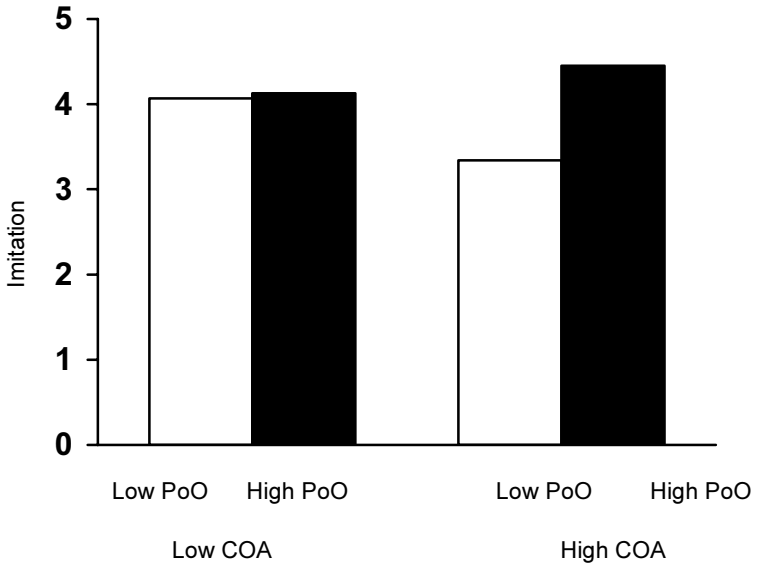
Confirming Hypothesis 1, a significant main effect for Performance of Other, F (1, 129) = 5.39, $p < .03$, $\eta^2 = .04$, was found. Participants showed more imitation in the high Performance of Other condition (M = 4.29, SD = 1.55) than in the low Performance of Other condition (M = 3.71, SD = 1.49).

Confirming Hypothesis 2, we also found a significant main effect for Task Difficulty, F (1, 129) = 12.17, $p < .001$, $\eta^2 = .09$. Participants showed more imitation in the high Task Difficulty condition (M = 4.43, SD = 1.28) than in the low Task Difficulty condition (M = 3.56, SD = 1.65).

Confirming Hypothesis 3, a significant Performance of Other X COA interaction effect, F (1, 129) = 4.40, $p < .04$, $\eta^2 = .03$, was found. Participants with high COA showed more imitation in the high Performance of Other condition (M = 4.45, SD = 1.56) than participants with low COA (M = 4.13, SD = 1.55). Participants with low COA showed more imitation in the low Performance of Other condition (M = 4.07, SD = 1.59) than participants with high COA (M = 3.34, SD = 1.29) (see Figure 2.1). Further analysis indeed revealed a significant main effect of Performance of Other within high COA, F (1, 134) = 7.28, $p < .01$, $\eta^2 = .05$, but no effect of Performance of Other within low COA, F (1, 134) = .09, *ns*.

Figure 2.1

Interaction effect of Performance of Other and COA on Imitation



We did not find the Task Difficulty X COA interaction, F (1, 129) = 1.92, $p < .20$, $\eta^2 = .02$, predicted in Hypothesis 4. Further analysis, however, revealed a significant main effect of task difficulty within high COA, F (1, 134) = 9.50, $p < .01$, $\eta^2 = .07$, whereas a similar effect was not obtained for people with low COA, F (1, 134) = 2.43, *ns*. While this is only very modest evidence, it is consistent with Hypothesis 4.

No other effects were found.

Creativity

As in the preliminary study, an analysis of variance on creativity showed a significant main effect for Task Difficulty, F (1, 129) = 34.72, $p < .0001$, $\eta^2 = .21$. Participants showed less creativity in the high Task Difficulty condition ($M = .99$, $SD = .57$) than in the low Task Difficulty condition ($M = 1.75$, $SD = .88$). No other effects were found.

Discussion

In the Main Study, we replicated the results of the preliminary study. It was, again, found that Performance of Others and Task Difficulty positively related to imitation in creative tasks. This once more confirmed Hypothesis 1 and 2. In addition, we found confirmation for Hypothesis 3 that especially people with high COA showed more imitation when Performance of Other was high than when Performance of Other was low. We found only partial evidence for Hypothesis 4, which stated that the effect of Task Difficulty on imitation would be stronger for people high on COA. We could not prove such an effect in general. However, further analysis of the interaction of Task Difficulty and COA revealed a trend towards the predicted pattern indicating that Task Difficulty leads to more imitation for people with high COA. Interestingly, individuals high on COA displayed little imitation in simple tasks. In such situations, they presumably still engaged in comparisons, but decided not to display much imitation. This is in accordance with our assumption that social comparison sets the stage for imitation, but does not by definition result in imitation.

In retrospect, it might not come as a surprise that the interactive effect of task difficulty and COA did not work out, whereas the interactive effect of performance of others and COA did. It is important to stress once more that social comparisons do not necessarily lead to imitation. In the social comparison

literature, one distinguishes between negative vs. positive evaluative consequences of social comparisons (Mussweiler, Rüter, & Epstude, 2004; Mussweiler & Strack, 2000a, 2000b). People high on COA are described as highly sensitive to uncertainty (Gibbons & Buunk, 1999). Our results suggest that individuals high on COA displayed little imitation in simple tasks. It seems reasonable that if a task does not cause much uncertainty because of its simplicity, there either is no reason for people high on COA to make comparisons with the performance of others, or to make negative comparison evaluations. In both cases, social comparisons do not lead to imitation. On the other hand, observation of others' performance at any time provided individuals with relatively objective information, as a result of which observation of high (vs. low) performance of others led to more imitation for individuals high on COA.

It was again found that Task Difficulty decreased creativity, whereas Performance of Other did not. This once more confirmed our belief that creativity is not driven by social comparison processes.

General Discussion

The purpose of the present study was to show from a social comparison point of view that imitation is a separate component of creative task performance, which differs from creativity in its reliance upon performance of others. Notwithstanding the vast bulk of literature on imitation in management research (e.g., Hargadon, 2002; Hargadon & Sutton, 1997), and in literature on diffusion of innovations (e.g., Abrahamson & Rosenkopf, 1993, 1997; Henrich, 2001; Henrich & Gil-White, 2001; Rogers, 2003; Valente, 1995), there hardly was any supporting empirical research into psychological determinants of imitation in creative tasks. Our research clearly showed that imitation is a different element of creative task

performance, which, unlike creativity, is driven by social comparison processes, and worthwhile further investigation in greater detail.

The main contribution of our research lies in the fact that it shows the importance of imitation as a separate and social comparison driven component of creative task performance. First of all, performance of others and task difficulty were found to be good predictors of imitative behavior in creative tasks, whereas creative behavior was only predicted by task difficulty. Moreover, individual differences in COA were found to moderate the effect of performance of others on imitation. More tentatively, evidence suggests that task difficulty also has a reliable effect with higher COA. These findings constitute first evidence to date indicating that imitation in creative tasks differs from creativity due to social comparison orientation. This bolsters our confidence in the conclusion that social comparison indeed sets the stage for imitation, and thus that social comparison theory provides us with a useful perspective for understanding the determinants of imitation in creative task settings.

We may, therefore, further explore imitative behavior in creative performance situations on the basis of other well-established findings from the social comparison paradigm. Given the richness of research in this paradigm, this opens up a vast array of possibilities for further research into imitation in creative tasks. For instance, what types of referents is one likely to select for comparison? Research has yielded evidence that comparison acts depend on perceived similarity to others (Collins, 1996, 2000; Wood, 1989). Perceived similarity with a referent other stimulates social comparison acts, and may lead to assimilation towards the target (Mussweiler & Strack, 2000a, 2000b; Mussweiler et al., 2004). Therefore, perceived similarity with others may lead to more imitation in creative tasks.

Over the years, social comparison research has gone through many stages (Buunk & Gibbons, 1997; Buunk & Mussweiler, 2001; Kruglanski & Mayseless, 1990; Suls & Wheeler, 2000; Suls & Wills, 1991; Wood, 1989). One frequently recognized shift in research has been the focus on the effects of social comparison (e.g., Buunk & Mussweiler, 2001). Our research shows that the social comparison process does not stop after evaluation, but has behavioral consequences. The present study shows that in creative task performance, comparisons could lead to imitative behavior. However, our results also indicate how crucial it is to separate social comparison acts from the engagement in imitative behavior. People who make comparisons with others need not necessarily engage in imitation of another's performance. That is, there is no one-on-one relationship between the extent to which people engage in social comparison and the extent to which they engage in imitative behavior. A social comparison perspective on imitation in creative tasks will thus not only need to predict social comparison, but also the outcome of that comparison. The specific factors studied in the present study (performance of others and task difficulty) allowed us to do this, but matters might not always be that straightforward. Here, then, lies a challenge for the development of a social comparison perspective on imitation in creative tasks.

It would be of practical relevance to apply the present research paradigm to literature on innovation diffusion. Research so far has shown how crucial imitation is in the process of spreading new ideas, opinions, or products throughout society (Henrich, 2001; Henrich & Gil-White, 2001). However, in explaining motivations for imitation, a key role is usually attributed to information used by people to evaluate the costs and benefits underlying the decision to adopt an innovation or not (Apesteguia et al., 2003; Rogers, 2003). There is, however, a strong need to also take other psychological mechanisms into account (Rook, 2006). People must, for instance, be willing to take risks in adopting new ideas,

products, or technologies (Smith et al., 2005). It has been shown that one way to regulate possible risk and failure is through processes of comparison with others (Kruglanski et al., 2000). The contribution of the present study to this body of literature, then, lies in our finding that social comparison sets the stage for imitation in creative tasks. Imitation is grounded in social comparison processes, and moderated by individual differences in social comparison orientation. Given that imitative behavior at the individual level has been shown to even have implications for cultural transmission on societal level (e.g., Boyd & Richerson, 1985), it seems, therefore, particularly worthwhile further investigating this issue in greater detail.

Of course, our research also has some limitations. First of all, our experiments were conducted in the lab and did not involve people in an actual organizational setting engaging in creative task performance as part of their job. This may raise questions about the generalizability of our findings. In this respect, it may be noted that experimental studies aim at establishing causality with a high level of internal validity, and are not conducted to establish external validity (Brown & Lord, 1999; Mook, 1983). Even so, one may raise the question of whether the same relationships may also be observed in organizational settings, where the creative task is not a one-off event and people can learn through experience and are often selected for their ability for creative performance. Similarly, in the present study we exposed people to a single creative exemplar object alone, whereas people in everyday practice are constantly exposed to multiple examples. Exposure to a greater number of examples might lead to different results (Marsh, Landau, & Hicks, 1996).

It would thus seem highly worthwhile testing the same hypotheses in the field in future research. As we discussed in the introduction, imitation in creative tasks seems to be a pervasive phenomenon underlying individual performance in

creative organizations, and general research in social comparison suggests that findings from the lab tend to generalize to the field (e.g., Blanton, Buunk, Gibbons, & Kuyper, 1999; Huguet, Dumas, Monteil, & Genestoux, 2001; Michinov, 2005) – just as evidence more generally suggests that findings from lab research tend to generalize to the field (Dipboye, 1990; Locke, 1986; van Knippenberg & van Knippenberg, 2005). It seems, therefore, reasonable to predict that the present findings may also obtain in organizational settings.

On the whole, the major strength of the present research is that for the first time the role of imitation in creative task performance was demonstrated. It was found that performance of others and task difficulty predicted imitation in creative settings. Moreover, comparison orientation for abilities was found to moderate these effects, most clearly for performance of others. Creativity, on the other hand, was only predicted by task difficulty, which bolsters our confidence in the fact that imitation in creative tasks indeed is the social component of creative behavior. The current findings advance our understanding of imitation in creative tasks, even though it should be acknowledged that other situational and personality factors might also influence imitation in creative tasks. Given the frequency of imitative behavior, and its implications on organizational and societal level, we are convinced of the urge to contribute to a better understanding of why imitation occurs. It would, therefore, be particularly relevant to further explore imitation in creative tasks.

3.

Imitation and Creativity: The Role of Quality of Performance of Other and Self-Regulatory Focus in Creative Task Performance

In creative settings, reliance upon creative exemplars sometimes leads to imitation, but other times to creativity. Self-regulation theory offers a tool to explain that such behaviors are motivationally embedded. We proposed that the outcome of creative task performance depends on the quality of exemplars of other's performance and one's self-regulatory focus. For imitation, the effect of performance of other is stronger for individuals with a promotion than with a prevention focus. For creativity, the effect of performance of other is weaker for individuals with a promotion than with a prevention focus. The former effect was expected to mediate the latter effect. We tested our predictions in a laboratory study, enabling us to measure imitation and creativity in a relatively objective manner. Results supported predictions, indicating that once we understand to what extent people engage in imitation, we are better able to predict how creative people are in creative task performance.

Introduction

Many designers and engineers working in creative domains follow strategies for performing creative tasks that range from imitation to innovation (e.g., Kirton, 1976, 1989). Close observation of other's performance sometimes motivates them to invent technologies, products, and ideas that are radically novel compared to such exemplars (e.g., Dahlin & Behrens, 2005; Schulz, 2001), but other times causes them to generate products that clearly resemble existing models (e.g., Hargadon, 2002; Hargadon & Sutton, 1997; Lieberman & Asaba, 2006; Sutton, 2002). Unfortunately, most creativity scholars limit their focus of attention to the benefits of originality while overlooking the role of exemplars in creative task performance (e.g., Smith, Ward, & Finke, 1995). Increasingly, however, it has been suggested that creativity consists of multiple types that differ in adaptive or innovative orientation (e.g., Cropley, 2006; Kim, 2006; Unsworth, 2001). This indicates that an understanding of the motivations underlying imitation and creativity in creative task performance thus is an essential part of understanding – and ultimately managing – creativity and innovation.

Even though regulatory focus theory (Higgins, 1997, 1998) has not considered the role of exemplars in creative task performance, it seems capable of adequately explaining that reliance upon others' performance in creative task performance is motivationally embedded. A vast body of research has been conducted in the light of the assumption that self-regulatory focus is a motivational principle consisting of either a promotion or a prevention focus (Higgins, 1997, 1998). In recent years, it has been shown that a promotion focus enhances creativity, whereas a prevention focus seemingly undermines it (Crowe & Higgins, 1997; Friedman & Förster, 2001, 2005; Higgins, 1997). However, these effects may be entirely different in the face of exemplars of other's creative performance. Much research for instance indicates that people in general tend to

differentially rely upon the quality of other's performance depending on particular situational settings (e.g., Buunk, Collins, Taylor, Van Yperen, & Dakof, 1990; Buunk & Mussweiler, 2001; Mussweiler, 2003; Mussweiler, Rüter, & Epstude, 2004; Lockwood, 2002; Lockwood, Jordan, & Kunda, 2002; Lockwood & Kunda, 1997, 1999). For the study of creative task performance, this seems to suggest that the quality of exemplars of other's performance and different self-regulatory foci may differentially motivate people to engage in imitation or creativity. By exploring the influence of factors such as the quality of the performance of other and self-regulatory focus in the present study, we may thus deepen our understanding of the motivational processes underlying imitation and creativity in creative task performance. In doing so, we aim to establish that once we know to what extent people engage in imitation, we are better able to predict and explain how creative people will be in their task performance.

Self-Regulation in Creative Task Performance

Imitation and creativity are widely recognized and important topics in contemporary psychological research. Imitation was among the first phenomena to be explored in psychological research (e.g., Le Bon, 1895; Tarde, 1903), while it took some time before the topic of creativity gained momentum (Guilford, 1950; Sternberg & Lubart, 1999, but see Albert & Runco, 1999). Now, several recent edited volumes are dedicated to imitation (e.g., Hurley & Chater, 2005a, 2005b; Meltzoff & Prinz, 2002; Rogers & Williams, 2006; Tomasello, 1999) as well as to creativity (e.g., Amabile, 1996; Paulus & Nijstad, 2003; Smith, Ward, & Finke, 1995; Sternberg, 1999).

In everyday life, imitation is often diametrically opposed to creativity. Imitation is mostly perceived as "not genuine or real", "artificial and inferior", or

"a copy that is presented as the original" (Webster's Online Dictionary, 2006), whereas creative behavior tends to be understood as "relating to or involving the use of imagination or original ideas in order to create something" (The Concise Oxford English Dictionary, 2006). Along such lines, researchers usually define creativity as the production of novel ideas that are unique relative to other available ideas (Amabile, 1996; Shalley, Zhou, & Oldham, 2004). However, in doing so, scholars largely overlook the vast influence of creative exemplars in creative task performance. Everyday practice on a societal (e.g., Henrich, 2001; Henrich & Gil-White, 2001; Tomasello, 1999; Tomasello, Kruger, & Ratner, 1993) and organizational level (e.g., Hargadon, 2002; Hargadon & Douglas, 2001; Hargadon & Sutton, 1997; Weisberg, 1995) indicates that creative performance in the face of exemplars often leads to imitation. It thus seems to make much more sense to treat creative task performance as including different behavioral types that differ in adaptive or innovative orientation (e.g., Cropley, 2006; Kim, 2006; Kirton, 1976, 1989).

Imitation is almost by definition contingent on the performance of others, while creativity yields products that are unique relative to other's performance. In the literature, imitation is usually understood as behavior in which someone copies and modifies an observed action or an exemplar that represents another's actions (e.g., Carpenter, Call, & Tomasello, 2002; Meltzoff, 1988, 1995; Prinz & Meltzoff, 2002; Tomasello et al., 1993). A limited number of scholars have considered the role of exemplars in creative task performance (Jansson & Smith, 1991; Marsh, Ward, & Landau, 1999; Smith, Ward, & Schumacher, 1993), and some have suggested that exemplars of other's performance may serve as guidelines for appropriate creative behavior (Marsh, Landau, & Hicks, 1996; Shalley & Perry-Smith, 2001). Even though sensitivity towards exemplars of other's good performance may cause creativity through imitation, copying

exemplars of other's performance should in general negatively influence creativity due to reduced novelty in generated outcome (Tomasello, 1999; Tomasello et al., 1993). It is, therefore, very important to focus on the role of exemplars in creative performance settings, because it stands to reason that once we know to what extent people engage in imitation of other's performance, we are better able to predict and explain how creative people will be in creative task performance.

Regulatory focus theory (Higgins, 1997, 1998) so far has not been applied to creative task performance in the face of exemplars, but it offers a tool to explain that the extent to which people rely upon exemplars of others' performance in creative task performance is motivationally embedded. Self-regulation tends to be understood as involving a promotion focus, which is a strategic inclination towards advancement, growth, and accomplishment, and a prevention focus, which is a strategic inclination towards security, safety, and responsibility (Crowe & Higgins, 1997; Higgins, 1997). One's regulatory focus has in recent years been found to affect creativity. Specifically, a promotion focus positively influences creative task performance compared to a prevention focus (Friedman & Förster, 2001, 2005). However, these effects may be entirely different in the face of exemplars of other's performance. Because a promotion focus increases a sensitivity towards other's good performance, while a prevention focus increases a sensitivity towards other's poor performance (Higgins & Tykocinski, 1992; Lockwood et al., 2002), we may predict that the quality of exemplars of other's performance also differentially influences people's creative task performance, depending on an individual's self-regulatory focus. Factors such as the quality of performance of other and one's self-regulatory focus should thus differentially influence creative task performance, sometimes leading to imitation, but other times to creativity. By exploring the influence of these factors in the present study,

therefore, we may improve our understanding of the role of motivational processes underlying creative task performance.

In creative task performance, people do not necessarily need to come up with a purely original response in order to satisfactory solve a creative problem (Hargadon, 2002; Hargadon & Douglas, 2001; Hargadon & Sutton, 1997). Examples of the successful performance of others may serve as a guideline for people to understand the most appropriate or successful behavioral acts, standards and/or solutions given the circumstances (Bandura, 1971, 1986). On a general level, it has been shown that observation of the successful performance of others often leads to imitation (Bandura, Ross, & Ross, 1963a, 1963b). Given that a promotion focus yields sensitivity towards successful performance of others (Higgins & Tykocinski, 1992; Lockwood et al., 2002), it seems reasonable to expect that especially promotion-focused people will rely upon other's high performance, leading to imitation in creative tasks. In the literature, however, there also exists evidence for a so-called "design fixation" in creative performance, which refers to conformity to a creative exemplar after exposure (Jansson & Smith, 1991; Rook & van Knippenberg, 2005; Smith et al., 1993). Design fixation implies that once you look at a creative exemplar, you automatically will to some extent be influenced by that exemplar. Counter-intuitively, because prevention-focused people are more sensitive to the low performance of others (Higgins & Tykocinski, 1992; Lockwood et al., 2002), they thus will more likely display imitation of an exemplar of the low performance of other. Our first hypothesis, therefore, is:

> *Hypothesis 1*: Individuals with a promotion focus display more imitation of exemplars of the high performance of other, whereas individuals with a prevention focus display more imitation of exemplars of the low performance of other.

Interestingly, a vast literature suggests that self-regulatory focus influences creativity. Specifically, a promotion focus is thought to enhance creativity, whereas a prevention focus is thought to undermine it (Crowe & Higgins, 1997; Friedman & Förster, 2001, 2005; Higgins, 1997). However, this research does not take into account that exemplars of other's performance may also affect the creative process. Because creativity is to a certain degree defined as originality compared to other's performance (Amabile, 1996; Shalley et al., 2004), it follows from our first hypothesis that a promotion focus does not necessarily stimulate creative performance. In the presence of an exemplar of another's high creative performance, design fixation may cause promotion-focused people to rely upon a creative exemplar to such extent that their generated end-product will be of limited novelty. This design fixation is less likely to occur in the presence of exemplars of low performance of other, causing promotion-focused people to display a higher degree of creativity. Prevention-focused people, on the other hand, will experience design fixation in the presence of exemplars of low performance of other, leading to reduced creativity. In the presence of high quality exemplars, though, this fixation effect is less likely to occur, which may cause prevention-focused people to be more creative. Therefore, our second hypothesis is:

> *Hypothesis 2*: Individuals with a promotion focus display more creativity in the presence of exemplars of the low performance of other, whereas individuals with a prevention focus display more creativity in the presence of exemplars of the high performance of other.

If it is true that exemplars of others' performance sometimes serve as guidelines for people to understand the appropriateness of particular behavior, it thus seems reasonable to expect that imitation will serve as a mediator between the effect of quality of the performance of other and one's self-regulatory focus on

creativity, such that higher levels of imitation are related to lower levels of creativity in task performance. Therefore, our third hypothesis is:

Hypothesis 3: The interaction effect of quality of the performance of other and self-regulatory focus on creativity is mediated by imitation.

These hypotheses were put to the test in a laboratory study. The main advantage of an experimental setting is that it enabled us to draw conclusions concerning causality, and to employ relatively objective behavioral measures of imitation and creativity.

The Present Study

For our study, we used a creative construction task in which participants were invited to build a 3D art object with Lego™ in the presence of an exemplar object. Thus, while constructing the object participants did not actually observe the other, but the product of their performance. Because we intended to study imitation of product features in creative behavior, this was sufficient for the occurrence of imitation. This experimental set-up enabled us to measure imitation and creativity with a relatively high degree of objectivity.

In this study, imitation was conceptually defined as similarity of product features in creative performance resulting from the observation of the creative product of another participant. Imitation was also rated by two independent raters who were blind to the objectives of the experiment. Each was instructed to score the amount of similarity of the exemplar object and the object created by the participant based on a shared number of formal characteristics. The exemplar object was: (1) built on a platform; (2) which was raised in a specific way; (3) the exemplar object was composed of an inner and an outer part; (4) the interior part was built from separate rails of a railway track that were stacked up (a) vertically;

(b) crosswise; and (c) close to each other; (5) the exterior part was composed of straight architectural columns; and (6) the object had a tower piece (a) of a given color, (b) shape, and (c) finishing. The scores for each application were summed up so as to come up with an overall score for imitation.

In this study, creativity was conceptually defined as the extent of product uniqueness in creative performance. Creativity was rated by two independent raters who were blind to the objectives of the experiment. Each was instructed to score the amount of novelty in the object created by the participant based on the extent to which application of pieces in given categories deviated from its standard usage. The object consisted of pieces in the following categories: (1) platform pieces, (2) railway tracks, and (3) bricks. The scores for each application were summed up so as to come up with an overall score for creativity.

Recently, Rook and van Knippenberg (2005) showed that the quality of performance of other influenced imitation in creative task performance, and that this influence was stronger for people that are more prone to social comparison as reflected on their scores on the comparison orientation for abilities (COA) scale (Gibbons & Buunk, 1999). For exploratory reasons, we therefore included a measure of COA in the design.

Method

Participants and Design

One hundred twenty five business students (87 men and 38 women; *M* age = 20.72 years, *SD* = 1.93) were paid €10 (approximately US$ 12) for their participation. The data from 4 participants were excluded from analyses because of a striking lack of interest in the task. The data from 6 participants could not be

analyzed due to technical problems with the photo camera used to record the products of their creative task performance.

Participants were randomly assigned to experimental conditions of a 2 (quality of performance of other: low, high) X 2 (self-regulatory focus: promotion, prevention) factorial design, to which COA was added as a continuous variable. COA was measured using the Iowa-Netherlands Comparison Orientation Measure (INCOM) (Gibbons & Buunk, 1999).

Experimental Procedure

On arrival in the laboratory room, participants were invited to take part in a 1 hour session presumably dedicated to diverse psychological studies on creativity. First, to administer the manipulation of self-regulatory focus (see below), they were given a paper-and-pencil assignment depicting a cartoon mouse sitting in the center of a maze. Participants were asked to find a way out of the maze for the mouse (Friedman & Förster, 2001). After 5 min, when participants had finished their assignment, they were invited to take a closer look at the mouse and the maze. They now were invited to write a short story (one-page) from the perspective of the mouse on a day in the life of this mouse. The fixed title of their story was provided in the task instructions. This extension was introduced with a cover story that "it was an attempt to determine whether people can take the perspective of others and imagine their circumstances" (Friedman & Förster, 2005, p. 269). After approximately 15 min, when participants had finished their story, a 3D Lego™ object, a box of Lego, and an instruction leaflet were handed out. This time they were instructed that they would participate in a construction task with the purpose to investigate new ways of stimulating creative performance within organizations. Participants were invited to build a 3D scale model of an art object to be placed in the new building of the school by means of the Lego™ pieces in

the closed box. Participants were given 30 min to finish the construction task. Finally, each participant filled out a questionnaire assessing manipulation checks.

Manipulation of Quality of Performance of Other. During the construction task, participants constantly faced a prominently exhibited 3D exemplar object. In the low performance of other condition, participants were told that a previous participant made this object, and performed poorly according to a team of experts. In the high performance of other condition, participants were told that a previous participant made this object, and performed well according to a team of experts.

Manipulation of Self-Regulatory Focus. In the promotion condition, to find a way out for the mouse, participants had to complete a maze with a piece of cheese located outside. In addition, they were asked to write a story on "The Happiest Day in the Life of the Mouse" from the perspective of the mouse. Participants were instructed to elaborate on the mouse finding its way out of the maze, becoming aware of the cheese, approaching it, and succeed in eating it. This was intended to make them concentrate on approaching and attaining desired gains (i.e., eating a nice chunk of cheese). In the prevention condition, to find a way out for the mouse, participants had to finish a maze with an owl flying around outside. In addition, they were asked to write a story on "The Terrible Death of the Mouse" from the perspective of the mouse. Participants were instructed to elaborate on the mouse finding its way out of the maze, becoming aware of the owl, failing to avoid it, and being eating by the owl. This was intended to make them concentrate on avoiding undesired threats but failing (i.e., getting eaten by the owl).

Comparison Orientation for Abilities (COA). To assess COA, we used the six item INCOM subscale for comparison orientation for abilities (Gibbons & Buunk, 1999). Participants were among others asked to what extent they always paid a lot of attention to how they did things compared with how others do things, to what extent they compared what they had done with how others had done if

they wanted to find out how well they had done on something, and to what extent they often compared how they were socially (e.g., social skills, popularity) with other people (responses on 5-point scales ranging from 1 (*not at all*) to 5 (*very much so*); Cronbach's α = .86).

Dependent Measures

In this study, imitation was understood as similarity of product features in creative performance of a participant that resulted from his or her observation of the creative product of another participant. The amount of similarity of the exemplar object and the object created by the participant was based on the number of shared formal characteristics. Striking characteristics of the exemplar object were: a raised platform, the clear distinction between an inner and outer space, the inner space consisting of vertically and crosswise stacked up train rails, the outer space consisting of straight columns, and a tower piece. This allowed us to determine an overall score for imitation on a scale ranging from 0 (*not at all*) to 15 (*very much so*) based on the number of overlapping formal features. These judgments of similarity were provided by two independent raters (Inter Rater Correlation r = .85).

In this study, creativity was understood as the extent to which a product of the creative performance of a participant was novel in response. The amount of creativity of the object made by the participant was based on the extent to which the total application of pieces in given categories deviated from its standard usage. Striking characteristics of creativity were: application as a wall or a sweep for the category platform pieces, application as airplane wings or a ski jump for the category railway pieces, application as irregular ornament of onion-shaped decoration for the category brick pieces. This allowed us to determine an overall score for creativity on a scale ranging from 0 (*not at all*) to 15 (*very much so*)

based on deviation from standard application. These judgments of novelty were provided by two independent raters (Inter Rater Correlation $r = .82$).

In this study, imitation and creativity were correlated ($r = -.51$, $p < .01$). This is not surprising, given that both factors are in part defined by novelty. The magnitude of the correlation also indicates, however, that imitation and creativity are not each others' perfect inverse, but differ from each other.

Aside from the measures of imitation and creativity, all responses were assessed on a 5-point scale ranging from 1 (*not at all*) to 5 (*very much so*).

Manipulation Checks

To test whether the manipulation of quality of performance of other was successful, we used eight items that among others asked participants to what extent they believed that the experts were content with the quality of the exemplar object, to what extent they believed that the experts were content with the performance of the participant who made the exemplar object, and to what extent they believed that the experts held the opinion that the participant who made the exemplar object came up with an original product (responses on 5-point scales ranging from 1 (*not at all*) to 5 (*very much so*); Cronbach's $\alpha = .96$).

To test whether the manipulation of self-regulatory focus was successful, we rated the stories the participants had written on a day in the life of the mouse. For the promotion condition, on a scale ranging from 1 (*not at all*) to 6 (*very much so*), two independent raters rated the extent to which participants had incorporated the following elements related to promotion: (1) awareness of the presence of a possible gain (i.e., smelling of the cheese), (2) willingness to approach the cheese, (3) the act of approaching the cheese, (4) succeed in finding the cheese, and (5) reaching the desired end-state (i.e., eating the cheese), (6) which was the most beautiful day in the life of the mouse (Inter Rater Correlation $r = .87$). For the

prevention condition, on a scale ranging from 1 (*not at all*) to 6 (*very much so*), two independent raters rated the extent to which participants had incorporated the following elements related to prevention: (1) awareness of the presence of a possible threat (i.e., getting eaten by the owl), (2) willingness to avoid the owl, (3) the act of avoiding the owl, (4) failing in escaping the owl, and (5) failing to reach the desired end-state (i.e., surviving the owl) (6) which was a terrible death for the mouse (Inter Rater Correlation $r = .98$).

Results

Manipulation Checks

A 2 (quality of performance of other: low, high) X 2 (self-regulatory focus: promotion, prevention) X COA analysis of variance on the manipulation check for quality of performance of other showed a significant main effect of performance of other, $F\ (1, 107) = 6.82$, $p < .01$, $\eta^2 = .06$. The high performance of a previous participant was indeed observed as higher ($M = 3.94$, $SD = .57$) than the low performance of a previous participant ($M = 2.47$, $SD = .84$). No other effects were found.

We conducted an analysis of variance on the manipulation checks for self-regulatory focus. First, we found a significant main effect of the promotion measure, $F\ (1, 107) = 150.62$, $p < .001$, $\eta^2 = .59$. Relative to elements of prevention ($M = .00$, $SD = .00$), participants in the promotion condition incorporated many promotion-focused elements ($M = 5.58$, $SD = .76$) in their endeavors. Second, we found a significant main effect of the prevention measure, $F\ (1, 107) = 286.84$, $p < .001$, $\eta^2 = .73$. Relative to elements of promotion ($M = .00$, $SD = .00$), participants in the prevention condition incorporated many

prevention-focused elements (M = 4.83, SD = .49) in their endeavors. No other effects were found.

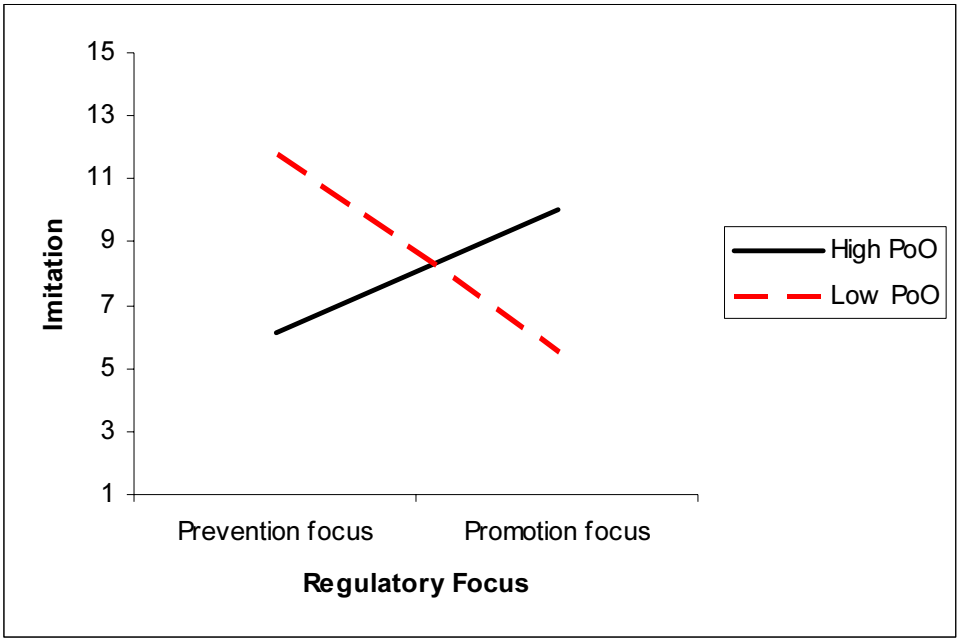
We could therefore conclude that the manipulations were effective.

Imitation

A regression analysis was conducted in order to test Hypothesis 1. We dummy-coded quality of performance of other and self-regulatory focus (-0.5 for low performance of other and for prevention; +0.5 for high performance of other and for promotion, respectively), added COA, computed the cross-products for the two-way and three-way interactions, and entered all factors into the equation (Aiken & West, 1991). Confirming Hypothesis 1, we found the predicted significant quality of performance of other X self-regulatory focus interaction effect on imitation, $\beta = .89$, $p < .04$. The pattern of the significant effect indicated that promotion-focused people displayed more imitation of the high rather than the low performance of other, whereas prevention-focused people displayed more imitation of the low rather than the high performance of other (see Figure 3.1).

Figure 3.1

Interaction Effect of Quality of Performance of Other and Self-Regulatory Focus on Imitation



Regression also revealed a significant quality of performance of other X self-regulatory focus X COA interaction effect, β = -.86, $p < .04$. Analysis of simple interactions within COA showed a significant effect between quality of performance of other and self-regulatory focus when COA was low, β = .26, $p = .05$. People low on COA and with a promotion focus displayed more imitation when performance of other was high than when performance of other was low, whereas people low on COA and with a prevention focus showed more imitation when performance of other was low rather than high. There was no significant interaction between quality of performance of other and self-regulatory focus when COA was high, β = -.15, $p < .ns$ (see Figure 3.2a & 3.2b).

Figure 3.2a

Interaction Effect of Quality of Performance of Other and Self-Regulatory Focus on Imitation for low COA

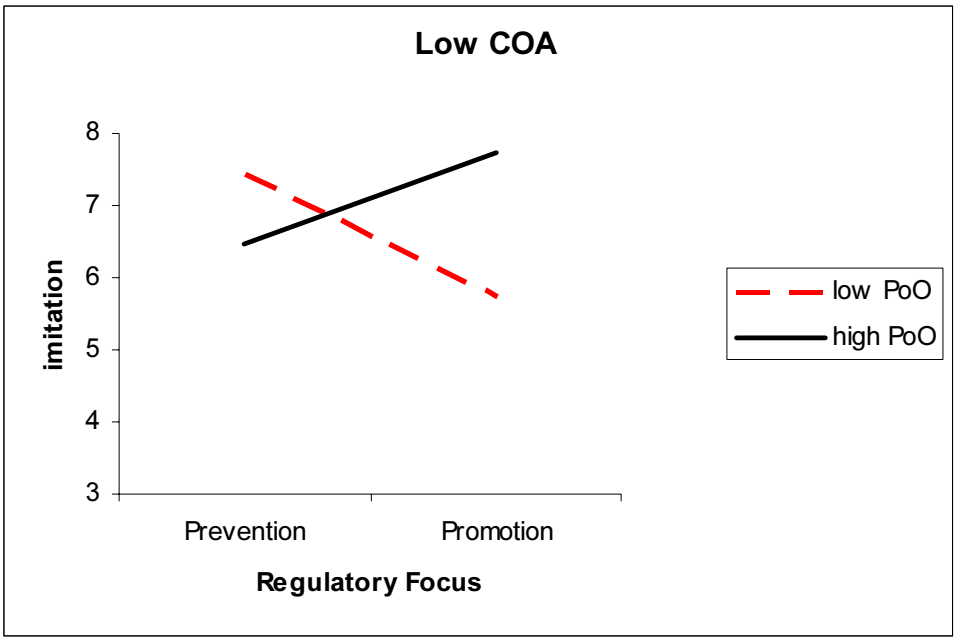
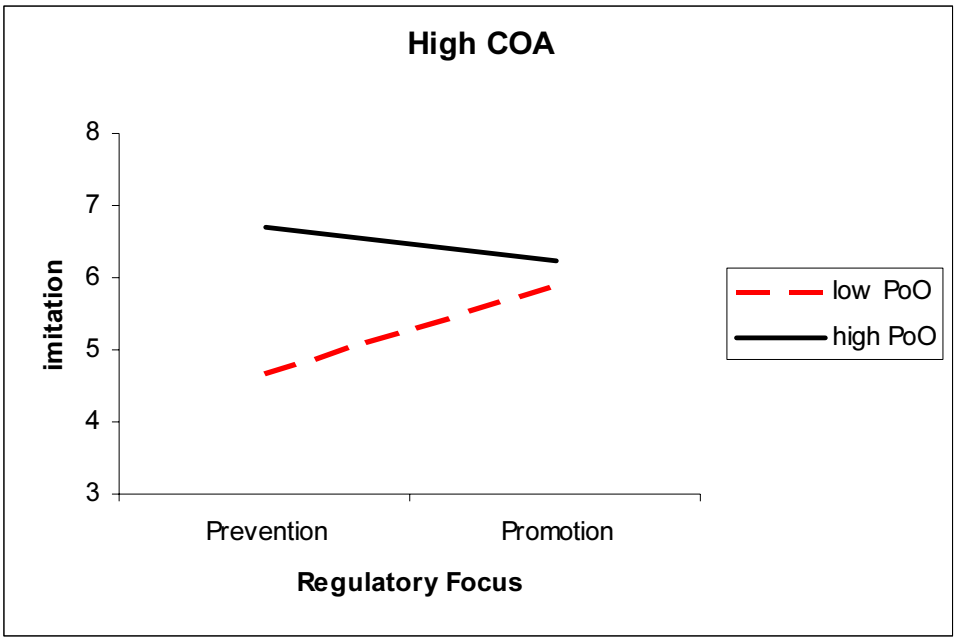


Figure 3.2b

Interaction Effect of Quality of Performance of Other and Self-Regulatory Focus on Imitation for high COA

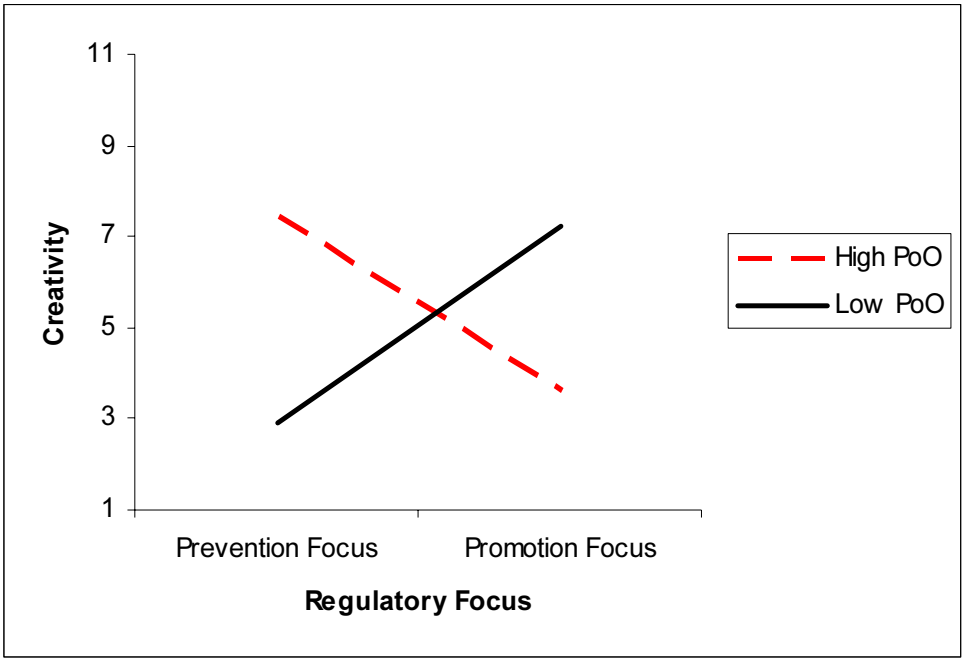


Creativity

Following the same procedure as for the first hypothesis, a regression analysis confirmed Hypothesis 2, which predicted a significant quality of performance of other X self-regulatory focus interaction effect on creativity, $\beta = -.85$, $p < .05$. Promotion-focused people displayed more creativity in the presence of low rather than high performance of other, whereas prevention-focused people displayed more creativity in the presence of high rather than low performance of other (see Figure 3.3).

Figure 3.3

Interaction Effect of Quality of Performance of Other and Self-Regulatory Focus on Creativity



Mediation Analysis

Hypothesis 3 predicted that imitation serves as a mediator for the interaction of quality of performance of other and self-regulatory focus on creativity. We conducted a series of regressions in order to put this to the test following Baron and Kenny's (1986) procedure. The first conditions for mediation were met via the aforementioned significant quality of performance of other X self-regulatory focus interactions on imitation and creativity. Adding imitation to the model led to a drop in β size of the effect of quality of performance of other X

self-regulatory focus on creativity, β = -.41, $p < .30$, in favor of a significant effect of imitation on creativity, β = -.50, $p < .001$. A Sobel test revealed that this decrease in β size was significant, $z = 1.94$, $p < .05$, one-sided. We thus found evidence for the predicted pattern of mediation, indicating that the higher the level of imitation in creative task performance, the lower the level of creativity.

Discussion

The purpose of the present study was to gain more insight in the motivational embeddedness of creative task performance and the fact that reliance upon exemplars of other's performance sometimes lead to imitation, but other times to creativity. Much research indicated that people differentially rely upon the quality of other's performance depending on particular situational settings, and that such processes are adequately understood from a self-regulatory focus perspective (Higgins, 1997, 1998; Higgins & Tykocinski, 1992; Lockwood et al., 2002; Miller & Prentice, 1996; Taylor et al., 1996). Our research clearly indicated that once we know to what extent people engage in imitation, we are better able to predict and explain how creative people will be in their task performance.

The present study confirmed our Hypothesis 1, which predicted a significant interaction effect of quality of the performance of other and self-regulatory focus on imitation. People with a promotion focus displayed more imitation of other's high rather than low performance, whereas prevention-focused people copied more of the low rather than high performance of other. For promotion-focused people, an exemplar of other's high performance thus seemed to provide guidance for reaching success. Even though the fact that prevention-focused people displayed more imitation of exemplars of the low performance of others seems counterintuitive, it is consistent with an established literature on

design fixation in creative task performance suggesting that exposure to any creative exemplar causes conformity to that exemplar (Jansson & Smith, 1991; Smith et al., 1993).

We further found confirmation for our Hypothesis 2, which predicted an interactive effect of quality of the performance of other and self-regulatory focus on creativity. People with a promotion focus displayed limited creativity in the presence of an exemplar of other's high creative performance, but showed more creativity in the presence of an exemplar of another's low performance. Prevention-focused people, on the other hand, displayed more creativity in the presence of high rather than low performance of other. These results are consistent with the aforementioned body of research on design fixation (Jansson & Smith, 1991; Rook & van Knippenberg, 2005; Smith et al., 1993), and seem to offer a further refinement to this literature in the sense that the presence of a creative exemplar of other's successful performance seems less harmful for the creative task performance of people with a prevention focus than for people with a promotion focus. In other words, to harvest the benefits of a promotion focus documented in previous studies (Crowe & Higgins, 1997; Friedman & Förster, 2001, 2005; Higgins, 1997), creative task performance should take place in a setting void of good creative exemplars.

We also found evidence for our Hypothesis 3 that imitation is a mediator of the interaction of quality of the performance of other and self-regulatory focus on creativity. It was found that the higher the level of imitation in creative task performance, the lower the level of creativity. This is in line with research suggesting that modifications that stem from imitative processes are of moderate instead of radical novelty (Tomasello, 1999; Tomasello et al., 1993). Furthermore, it constitutes first evidence for a pattern of creative task performance which is often theoretically assumed (e.g., Bandura, 1986; Marsh, Landau, & Hicks, 1996;

Shalley & Perry-Smith, 2001), but to our knowledge never explicitly empirically tested. Creativity benefits from conditions under which imitation is less likely to occur.

We also explored the role of comparison orientation for abilities (COA), and found an interactive effect of quality of the performance of other, self-regulatory focus, and COA on imitation. Analysis of the simple interactions within COA showed that people low on COA with a promotion focus displayed more imitation of another's high rather than low performance, whereas people low on COA with a prevention focus showed more imitation when performance of other was low rather than high. This indicates that the predicted two-way interaction of quality of the performance of other and self-regulatory focus on imitation especially holds for people low on COA. There was no significant interaction between quality of the performance of other and self-regulatory focus when COA was high. Apparently, people high on COA made comparisons with the performance of others regardless of their self-regulatory focus. This is in line with the recent finding that the quality of performance of other influences imitation in creative task performance, and that this influence in general is stronger for people that are more prone to social comparison (Rook & van Knippenberg, 2005).

The contributions of the present research are twofold. First, our study contributes to the domain of creativity research. So far, the focus of attention has mainly been on the generation of radically novel ideas or products (e.g., Smith et al., 1995), as a result of which the role of exemplars of other's creative performance was largely overlooked. Our study, however, makes clear that creative task performance is not conducted in a social vacuum. Even though people may perform a creative task without taking any notice of exemplars of other's creative performance, our study suggests that people also sometimes rely upon exemplars of other's creative performance and, as a result, generate imitative

products. This may open up a new avenue for future research into creative task performance. For instance, it has recently been suggested that different creative tasks may trigger fundamentally different types of creative behavior (Cropley, 2006; Kim, 2006; Kirton, 1989; Shalley et al., 2004; Unsworth, 2001). It would be worthwhile further investigating such issues in greater detail while more directly acknowledging the many facets that constitute the role of exemplars of other's performance in the creative process. Importantly, this implies that we should always include creative exemplars in research designs aimed at the study of creative task performance, that is, in the absence of exemplars we will never be able to confirm that imitation and creativity may well be distinct elements of creative task performance, which will be differentially activated at different times, depending on situational cues that make them more salient.

The present research also contributes to regulatory focus theory by extending its range of possible applications. So far, the self-regulatory focus perspective on creative task performance has been that a promotion focus enhances creativity, whereas a prevention focus undermines it (Crowe & Higgins, 1997; Friedman & Förster, 2001, 2005; Higgins, 1997). Our study clearly indicates that matters may not be as straightforward. Our research shows that it is important to consider the role of exemplars of other's performance in the creative process, because one's self-regulatory focus differentially motivates people to generate novel products or ideas in the face of creative exemplars. Moreover, the present findings are helpful in understanding and anticipating the level of novelty in generated output, given that an imitative approach almost by definition leads to moderate novelty, whereas a creative approach may lead to more radical novelty in task performance.

It would be of practical relevance to apply the present analysis to innovation management. Creative performance is in general considered to be of

vital importance for organizations (e.g., Amabile, 1996, Shalley et al., 2004), but the main focus of attention so far has mostly been on facilitating the production of radical novelty (Unsworth, 2001). However, in organizational practice it may as often be the case that creative tasks require more average rather than radically novel solutions (e.g., Förster, Friedman, & Liberman, 2004). If this is true, project managers in applied organizational setting should benefit from a more thorough understanding of the impact of organizational climate on creative task performance. It has, for instance, recently been suggested that organizational cultures may be more oriented to promotion or prevention (Brockner & Higgins, 2001). Managing a creative project in an organizational environment characterized by promotion may direct the creative process towards radical invention, while managing a creative project in an organizational environment characterized by prevention may yield moderate novelty. For organizational practice, it seems, therefore, recommendable to stimulate the development of detailed knowledge on these matters so as to enable managers to manage technology and innovation by alignment of such techniques in a project with the desired types of creative output (Baron & Ward, 2004).

Our research also has limitations. First, we conducted a laboratory experiment which did not involve creative professionals in a real-life organizational setting performing a creative task as part of their job. Of course, experimental studies aim at establishing causality with a high level of internal validity and are not conducted to establish external validity (Brown & Lord, 1999; Mook, 1983). Nonetheless, the issue remains whether the same relationships may also be observed in organizational settings where a creative task is not a one-off event and people can learn through experience (and are often selected for their ability for creative performance). Similarly, we exposed people to a single creative exemplar, whereas exposure to a greater number of examples may yield different

results (Marsh et al., 1996). Given the increasing evidence for the existence of a fit between one's regulatory mode and the way in which someone engages in the process of doing things (e.g., Avnet & Higgins, 2003, 2006; Higgins, 2000; Kruglanski, 2006), people in the presence of multiple examples of other's creative performance may choose to compare with an exemplar that best fits their regulatory mode given the circumstances.

It would thus seem highly worthwhile testing our framework for studying creative task performance in the field in future research. Research in self-regulation (e.g., Benjamin & Flynn, 2006) and in social comparison (e.g., Blanton, Buunk, Gibbons, & Kuyper, 1999; Michinov, 2005) suggests that findings from the lab tend to generalize to the field – just as evidence more generally suggests that findings from lab research tend to generalize to the field (Dipboye, 1990; Locke, 1986; van Knippenberg & van Knippenberg, 2005). Furthermore, even though our findings are derived from a single study, it has been put forward that "experimental research is generalized on the basis of the theoretical relationships that are tested, not through the concrete results of a single study" (Driskell & Salas, 1992, p. 113). It therefore seems reasonable to predict that the present findings may also obtain in organizational settings.

In conclusion, it is our hope that the present research will offer fertile ground for the exploration of similar and related avenues of future research into the motivational underpinnings of imitation and creativity in creative performance settings. If the present research aimed to shed light on one observation, it may well have been that in creative task performance one's tendencies to rely upon creative exemplars and one's subsequent imitative or creative actions depend on one's motivational orientation towards self-regulation, and on the quality of exemplars of other's performance that may render such regulatory foci more or less salient. We should, therefore, strive to more fully investigate the role of exemplars of the

creative performance of others and one's self-regulatory motivations on creative task performance.

4.

Imitation and Creativity in Idea Generation: Effects of Self-Regulatory Focus and Exemplar Presentation

Creativity research tends to overlook the role of imitation of creative exemplars. We propose that in creative idea generation, imitation of creative exemplars yields the generation of creative ideas, and that individuals' self-regulatory focus and the abstraction of the exemplar interact to influence imitation and creativity in idea generation. Promotion-focused people display more imitation and creativity when faced with an abstract exemplar, whereas prevention-focused people do so when faced with a specific exemplar. Moreover, imitation was expected to mediate the effect of one's self-regulatory focus and exemplar presentation on creativity. These predictions were tested in a laboratory study enabling us to measure imitation and creativity in a relatively objective manner. Results supported predictions, indicating that once we understand to what extent people engage in imitation, we are better able to predict how creative people are in idea generation.

Introduction

A common strategy for idea generation in creative organizations is to focus on exemplars that have inspired another's creative performance (Osborn, 1963; Sutton & Hargadon, 1996). This often causes creative professionals to come up with ideas that are radically novel compared to such exemplars (e.g., Dahlin & Behrens, 2005; Schulz, 2001), but other times leads them to generate ideas that clearly resemble existing models (e.g., Hargadon, 2002; Hargadon & Sutton, 1997; Lieberman & Asaba, 2006; Sutton, 2002). Organizational practice thus seems to suggest that people may generate creative ideas independent from creative exemplars, but that they also have the possibility to rely upon such exemplars to increase their performance in idea generation. This indicates that we need to understand the psychology of imitation in order to more fully understand – and to ultimately manage – creativity in idea generation.

Importantly, in order to adequately understand the role of imitation in creativity, we need to account for the characteristics of the individuals performing the creative task as well as of the creative exemplars that may inspire imitation. A growing literature points to the role of the motivational principle of self-regulatory focus (Higgins, 1997, 1998) in explaining organizational behavior in general (Benjamin & Flynn, 2006; Brockner & Higgins, 2001; Kark & Van-Dijk, 2007), and creativity in particular (Crowe & Higgins, 1997; Higgins, 1997). Self-regulatory focus theory distinguishes between a promotion focus, which is a focus on achieving positive outcomes, and a prevention focus, which is a focus on avoiding negative outcomes. Research has shown that in the absence of creative exemplars a promotion focus enhances creativity, whereas a prevention focus seemingly undermines it (Friedman & Förster, 2001, 2005). However, self-regulatory focus also differentially influences the way in which people rely upon

information in the environment (e.g., Aaker & Lee, 2001; Aaker, Lee, & Gardner, 2000; Lockwood, Jordan, & Kunda, 2002). Interestingly, a different line of research exists suggesting that people in general differ in the extent to which they pay attention to abstract and specific information (e.g., Derryberry & Tucker, 1994; Förster, Friedman, & Liberman, 2004; Kühnen, Hannover, & Schubert, 2001; Kühnen & Oyserman, 2002; Nisbett, Peng, Choi, & Norenzayan, 2001; Ward, Patterson, & Sifonis, 2004). For the study of idea generation, this seems to suggest that the effect of self-regulatory focus on imitation and creativity thus depends on presentation of a creative exemplar in terms of abstraction or specificity. By exploring the role of these factors in the present study, we may therefore deepen our understanding of the role of imitation in the context of creative idea generation.

Imitation and Creativity in Idea Generation

Imitation and creativity are widely recognized and important topics in contemporary behavioral research. Several recent edited volumes are dedicated to imitation (e.g., Hurley & Chater, 2005a, 2005b; Meltzoff & Prinz, 2002; Rogers & Williams, 2006; Tomasello, 1999) as well as to creativity (e.g., Amabile, 1996; Paulus & Nijstad, 2003; Runco, 1994; Smith, Ward, & Finke, 1995; Sternberg, 1999).

In everyday life, imitation is often diametrically opposed to creativity. Imitation is mostly perceived as "a copy that is presented as the original" (Webster's Online Dictionary, 2006), whereas creativity tends to be regarded as "relating to or involving the use of imagination or original ideas in order to create something" (The Concise Oxford English Dictionary, 2006). Along such lines, there has long been only limited interest in imitation in creative performance settings. Creativity researchers in general focused more on the production of novel

ideas that are unique relative to other available ideas (e.g., Amabile, 1996; Mandler, 1995; Shalley, Zhou, & Oldham, 2004), and tended to perceive imitation as a constraint to creativity (e.g., Smith et al., 1995; Ward, 1994). However, anecdotal evidence from organizational practice (e.g., Hargadon, 2002; Hargadon & Douglas, 2001; Hargadon & Sutton, 1997; Simonton, 1999; Sutton & Hargadon, 1996; Weisberg, 1995) seems to suggest that creative professionals always have the possibility to use exemplars that inspired the creative performance of others in order to satisfactory solve a creative problem. Imitation must thus be regarded as an important element in creative task performance.

Imitation is almost by definition contingent on the observation of exemplars of other's performance, while creativity yields products that are unique relative to other's performance. Imitation is usually understood as behavior in which someone not only reproduces observed behavior, but also actively generates modifications (e.g., Carpenter, Call, & Tomasello, 2002; Hurley & Chater, 2005a, 2005b; Prinz & Meltzoff, 2002; Tomasello, 1999; Tomasello, Savage-Rumbaugh, & Kruger, 1993). Interestingly, a small number of scholars have considered the role of exemplars in creative task performance (Jansson & Smith, 1991; Marsh, Ward, & Landau, 1999; Smith, Ward, & Schumacher, 1993), and some have suggested that exemplars may serve as guidelines for appropriate creative behavior (Bandura, 1986; Estes & Ward, 2002; Marsh, Landau, & Hicks, 1996; Rietzschel, Nijstad, & Stroebe, 2005; Shalley & Perry-Smith, 2001). Even though copying exemplars in general negatively influences creativity due to reduced novelty in generated outcome (Tomasello, 1999; Tomasello et al., 1993), reliance on exemplars may thus also cause creativity through imitation of an appropriate role model. This may particularly be the case in creative idea generation, in which quantity has been found to breed quality – that is, the more ideas are generated, the more good ideas will be produced (e.g., Osborn, 1963; Diehl & Stroebe, 1987;

Parnes & Meadow, 1959). In the context of creative idea generation, imitation may thus also provide the spark for the generation of more novel and creative ideas. It is, therefore, important to focus on the role of exemplars in creative idea generation, because once we understand to what extent people engage in imitation, we are better able to predict how creative people are in idea generation.

Regulatory focus theory (Higgins, 1997, 1998) has recently been applied to creative task performance in the face of exemplars, and is helpful in explaining that the extent to which people rely upon exemplars in creative idea generation is motivationally embedded (see also Rook & van Knippenberg, 2006). Self-regulation can be understood as involving a promotion focus or a strategic inclination towards advancement, growth, and accomplishment, and a prevention focus or a strategic inclination towards security, safety, and responsibility (Crowe & Higgins, 1997; Higgins, 1997). A promotion focus has been shown to positively influence creative performance, whereas a prevention focus seemingly undermines it (Friedman & Förster, 2001, 2005). These effects, however, may be completely different in the face of creative exemplars. Some research for instance seems to suggest that people differentially rely on information that is presented in a more general or in a more concrete manner depending on self-regulatory focus (Semin, Higgins, de Montes, Estourget, & Valencia, 2005). Factors such as self-regulatory focus and exemplar presentation should thus interact to influence idea generation. By exploring the influence of these factors in the present study, therefore, we may improve our understanding of imitation and creativity in idea generation.

Even though exemplars of others' performance sometimes serve as guidelines for appropriate creative behavior (e.g., Bandura, 1986; Estes & Ward, 2002; Marsh et al., 1996; Shalley & Perry-Smith, 2001), this is not per definition the case. In general, self-regulatory focus has an influence on one's sensitivity to environmental information (Aaker & Lee, 2001; Aaker, Lee, & Gardner, 2000;

Lockwood, Jordan, & Kunda, 2002). Some theorize (Förster et al., 2004; Förster, Friedman, Özelsel, & Denzler, 2006) and show (Semin et al., 2005) that a promotion focus yields attention to general and abstract information, whereas a prevention focus leads to attention to specific information. Other research, while ignoring the role of self-regulatory focus, points to the role of presenting a creative exemplar in terms of abstraction or specificity (e.g., Ward, 1994; Ward, Patterson, Sifonis, Dodds, & Saunders, 2002). For instance, a student enrolled in the painting curriculum in Art College could be provided with a relevant general idea for a painting in abstract terms, but could also be presented with a specific painting. It thus stands to reason that promotion-focused people in an idea generation task will be more sensitive to an abstract creative exemplar leading to imitation, whereas prevention-focused people will be more sensitive to a specific creative exemplar leading to imitation. Therefore, our first hypothesis is:

> *Hypothesis 1*: In idea generation, individuals with a promotion focus display more imitation of an abstract creative exemplar, whereas individuals with a prevention focus display more imitation of a specific creative exemplar.

A well-established body of literature indicates that self-regulatory focus influences creativity. It has for instance been shown that a promotion focus leads to radical and daring outcomes in creative task performance, whereas a prevention focus leads to careful and vigilant outcomes (Crowe & Higgins, 1997; Friedman & Förster, 2001, 2005; Higgins, 1997). This research, though, largely overlooks the fact that idea generation in organizational practice often is conducted in settings in which creative exemplars are present (Sutton & Hargadon, 1996), and in which quantity is supposed to lead to creative quality (e.g., Osborn, 1963; Diehl & Stroebe, 1987; Parnes & Meadow, 1959). As a consequence, a creative exemplar may serve as a guideline for appropriate creative behavior. For instance, it may

lead people to generate more creative solutions within the same category as the exemplar or to generate new ideas in related categories. Because promotion-focused people will be more open to an abstract creative exemplar in an idea generation task, whereas prevention-focused people will be more oriented towards a specific creative exemplar, the interaction effect of self-regulatory focus and exemplar presentation on imitation may thus also lead to creativity. Therefore, our second hypothesis is:

> *Hypothesis 2*: In idea generation, individuals with a promotion focus display more creativity in the presence of an abstract creative exemplar, whereas individuals with a prevention focus display more creativity in the presence of a specific creative exemplar.

Even though imitation may serve as a guideline for appropriate creative behavior, it is incapable of fully explaining all creative behavior, because people always have the possibility to generate ideas in categories that clearly differ from the presented exemplar. As a consequence, imitation can at most be a partial mediator for the relation of self-regulatory focus and exemplar presentation on creativity, such that higher levels of imitation are related to higher levels of creativity in task performance. Therefore, our third hypothesis is:

> *Hypothesis 3*: The interaction effect of self-regulatory focus and exemplar presentation on creativity is partially mediated by imitation.

These hypotheses were put to the test in a laboratory study. The main advantage of an experimental setting is that it enabled us to draw conclusions concerning causality, and to employ relatively objective behavioral measures of imitation and creativity.

The Present Study

For the laboratory study, we modified a creative idea generation task used by Friedman and Förster (2001, 2005) in which participants were invited to come up with creative uses for a brick. To enable us to study imitation of product features in creative idea generation, we added a creative exemplar to the task. Thus, while generating ideas, participants could copy elements of a creative exemplar which supposedly had previously inspired other's performance. Because we intended to study imitation of product features in creative behavior, this was sufficient for the occurrence of imitation. This experimental set-up enabled us to measure imitation and creativity with a relatively high degree of objectivity.

Imitation was operationalized as the overall similarity of product features in creative idea generation resulting from reliance on a creative exemplar which had inspired another participant. Imitation was rated by two independent raters who were blind to the objectives of the experiment. Each was instructed to score the total amount of similarity between the exemplar and the number of ideas generated by the participant based on a shared number of formal characteristics. The creative exemplar depended on mode of presentation – a picture of a brick art/design furniture object for the specificity condition and a text referring to the abstract category of art/design and furniture for the abstraction condition. For both conditions, the scores for each solution were summed up and divided by the total number of generated appropriate solutions so as to come up with an overall score for imitation.

Creativity was operationalized as the degree of novelty in the total generation of creative ideas. Creativity was also rated by two independent raters who were blind to the objectives of the experiment. Each was instructed to score the amount of novelty in the ideas generated by the participant based on the extent to which a solution was rare in response. The scores for each solution were

summed up and divided by the total number of generated solutions so as to come up with an overall score for creativity.

Method

Participants and Design

One hundred and fifty six business students (89 men and 67 women; *M* age = 20.47 years, *SD* = 2.25) were paid €5 (approximately US$ 6) for their participation. Participants were randomly assigned to the conditions of a 2 (self-regulatory focus: promotion, prevention) X 2 (exemplar presentation: abstract, specific) factorial design.

Experimental Procedure

On arrival in the laboratory room, participants were invited to take part in a 30 min session presumably dedicated to diverse psychological studies. First, to administer the manipulation of self-regulatory focus (see below), they were given a paper-and-pencil assignment depicting a cartoon mouse sitting in the center of a maze. Participants were asked to find a way out of the maze for the mouse (Friedman & Förster, 2001). After 1-2 min, when participants had finished their assignment, they were invited to take a closer look at the mouse and the maze. They now were invited to write a one-page story from the perspective of the mouse on a day in the life of this mouse. The fixed title of their story was provided in the task instructions. This extension was introduced with a cover story that "it was an attempt to determine whether people can take the perspective of others and imagine their circumstances" (Friedman & Förster, 2005, p. 269). After approximately 10-15 min, when participants had finished their story, they were

invited to generate as many creative uses for application of a brick as they could think of, and to write down their ideas on the provided pages. They were instructed to avoid solutions that were too obvious or inappropriate (Friedman & Förster, 2001, 2005). In addition, they were provided with a creative exemplar which could be used for inspiration. Participants were given 10-15 min to finish their idea generation task. Finally, each participant filled out a questionnaire assessing manipulation checks.

Manipulation of Self-Regulatory Focus. In the promotion condition, to find a way out for the mouse, participants had to complete a maze with a piece of cheese located outside. In addition, they were asked to write a story on "The Happiest Day in the Life of the Mouse" from the perspective of the mouse. Participants were instructed to elaborate on the mouse finding its way out of the maze, becoming aware of the cheese, approaching it, and succeed in eating it. This was intended to make them focus on attaining a desired gain (i.e., eating a nice chunk of cheese). In the prevention condition, to find a way out for the mouse, participants had to finish a maze with an owl flying around outside. In addition, they were asked to write a story on "The Terrible Death of the Mouse" from the perspective of the mouse. Participants were instructed to elaborate on the mouse finding its way out of the maze, becoming aware of the owl, failing to avoid it, and being eating by the owl. This was intended to make them focus on avoiding an undesired threat (i.e., getting eaten by the owl).

Manipulation of Exemplar Presentation. Participants in the abstraction condition were exposed to a text describing the general categories of art/design and furniture. In the specificity condition, participants were exposed to a specific instance of the combination of these categories (a picture of two brick seats and a sofa, that is, a work of art/design representing furniture).

Dependent Measures

In this study, imitation was understood as the overall similarity of product features in the generation of appropriate creative ideas after having been exposed to a creative exemplar. The amount of similarity of the exemplar and the ideas generated by the participant was based on the number of shared formal characteristics. Striking characteristics of the abstract and specific exemplar were that it represented a work of art/design of brick seats and a sofa. Consistent with the dominant belief that imitation ranges from instances of pure (one-on-one) imitation to instances of more selective (partial) imitation (Hurley & Chater, 2005a, 2005b; Tomasello, 1999; Whiten, Horner, Litchfield & Marshall-Pescini, 2004), pure copying of the exemplar (i.e., mentioning "work of art/design", "furniture", "seat" or "sofa") was credited with two points per generated solution, whereas mentioning an application within these broader categories was credited with one point per generated solution. The scores for each solution were summed up and divided by the total number of generated solutions so as to determine an overall score for imitation. These judgments of similarity were provided by two independent raters (Inter Rater Correlation $r = .97$).

Creativity tends to be conceptually defined as a response that is both novel and appropriate to the task at hand (Amabile, 1996). In this study, following this definition, and consistent with the assumptions underlying standard divergent thinking tasks (such as those in which one is asked to list uses for a brick), creativity was thus understood as the extent to which a total number of appropriate ideas generated by the participant was novel (Guilford, 1950; Runco, Dow, & Smith, 2006; Runco & Sakamoto, 1999). Therefore, the most inappropriate responses (e.g., related to killing other living creatures with the help of a brick) were excluded from analysis. Instead, the amount of creativity in generated ideas was based on the extent to which suggested solutions had less-often been proposed

relative to the total number of generated responses (Sternberg & Lubart, 1999). Examples of frequent usage of a brick in the generated solutions were, for instance, the act of throwing a brick, or building a wall with it. Examples of less frequently generated applications for a brick were to use them as weight for dancers in choreography to slow down their movements in the course of the performance for thematic purposes. The scores for each solution were summed up and divided by the total number of appropriate generated solutions so as to come up with an overall score for creativity. These judgments of novelty were provided by two independent raters (Inter Rater Correlation r = .92).

Manipulation Checks

To test whether the manipulation of self-regulatory focus was successful, we rated the stories the participants had written on a day in the life of the mouse. For promotion focus, two independent raters rated the extent to which the participants had incorporated the following elements: (1) awareness of the presence of a possible gain (i.e., smelling of the cheese), (2) willingness to focus on the cheese, (3) the act of approaching the cheese, (4) succeed in finding the cheese, and (5) reaching the desired end-state (i.e., eating the cheese), (6) which was the most beautiful day in the life of the mouse, on a 6-point scale ranging from 1 (*not at all*) to 6 (*very much so*) (Inter Rater Correlation r = .94). For prevention focus, the raters rated the extent to which the participants had incorporated the following elements: (1) awareness of the presence of a possible threat (i.e., getting eaten by the owl), (2) willingness to focus on avoiding the owl, (3) the act of avoiding the owl, (4) failing in escaping the owl, and (5) failing to reach the desired end-state (i.e., surviving the owl) (6) which was a terrible death for the mouse, on a 6-point scale ranging from 1 (*not at all*) to 6 (*very much so*) (Inter Rater Correlation r = .90).

Results

Manipulation Checks

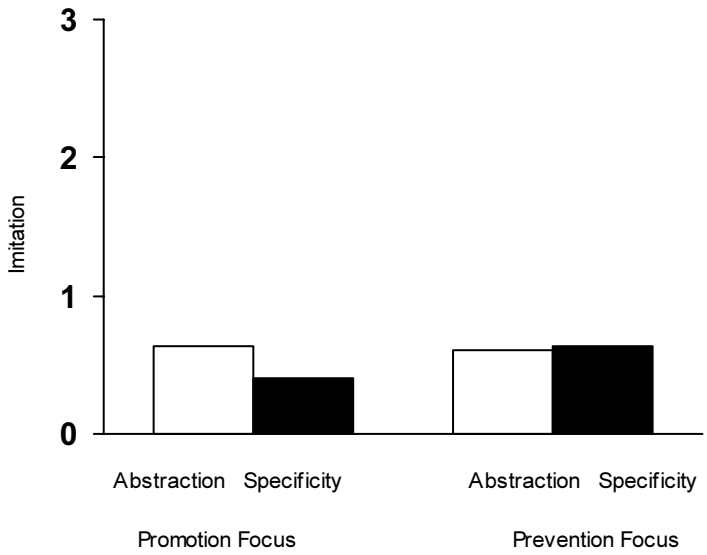
We conducted an analysis of variance on the manipulation checks for self-regulatory focus. We found a significant main effect of self-regulatory focus for the promotion measure, F (1, 152) = 6216.04, $p < .001$, $\eta^2 = .98$. Relative to elements related to a prevention focus ($M = .00$, $SD = .00$), participants indeed incorporated many promotion-focused elements ($M = 5.26$, $SD = .59$) in their endeavors. We also found a significant main effect of self-regulatory focus for the prevention measure, F (1, 152) = 6761.53, $p < .001$, $\eta^2 = .98$. Relative to elements related to promotion ($M = .00$, $SD = .00$), participants indeed incorporated many prevention-focused elements ($M = 4.90$, $SD = .53$) in their endeavors. No other effects were found. We could therefore conclude that the manipulation was effective.

Imitation

Confirming Hypothesis 1, an analysis of variance revealed the predicted significant self-regulatory focus X exemplar presentation interaction effect on imitation, F (1, 152) = 3.78, $p < .05$, $\eta^2 = .02$. Promotion-focused people showed more imitation in the presence of an abstract ($M = .64$, $SD = .42$) than a specific exemplar ($M = .40$, $SD = .33$), whereas prevention-focused people displayed imitation in the presence of an abstract ($M = .61$, $SD = .48$) and a specific exemplar ($M = .64$, $SD = .45$) (see Figure 4.1).

Figure 4.1

Interaction effect of Self-regulatory Focus and Exemplar Presentation on Imitation



Further analysis indeed showed a significant effect of exemplar presentation within a promotion focus, F (1, 152) = 5.85, $p < .02$, $\eta^2 = .01$, but not within a prevention focus, F (1, 152) = .66, *ns,* and a significant effect of self-regulatory focus within a specific exemplar, F (1, 152) = 6.10, $p < .02$, $\eta^2 = .04$, but not within an abstract exemplar, F (1, 152) = .06, *ns*.

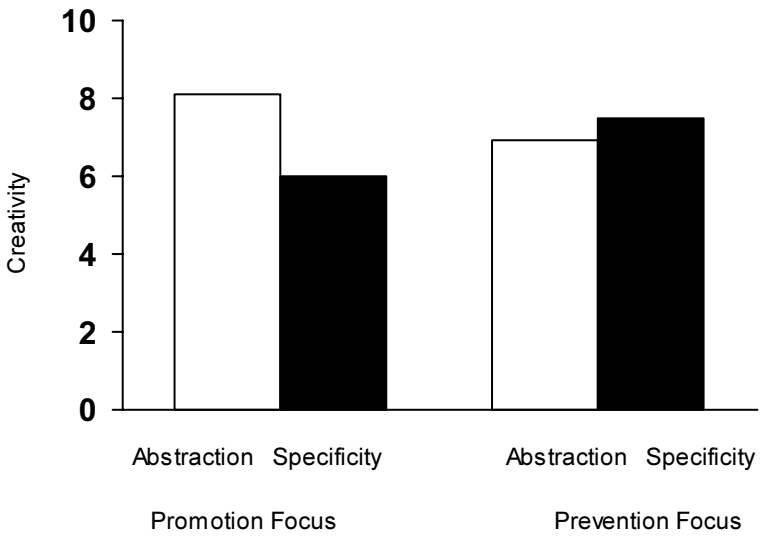
Creativity

Confirming Hypothesis 2, an analysis of variance revealed the predicted significant self-regulatory focus X exemplar presentation interaction effect on creativity, F (1, 152) = 7.84, $p < .01$, $\eta^2 = .05$. Promotion-focused people showed more creativity in the presence of an abstract (M = 8.09, SD = 3.54) than of a

specific exemplar (M = 5.98, SD = 2.90), whereas prevention-focused people displayed more creativity in the presence of a specific (M = 7.51, SD = 3.06) than of an abstract exemplar (M = 6.92, SD = 2.36) (see Figure 4.2). Further analysis indeed showed a significant effect of exemplar presentation within a promotion focus, F (1, 152) = 9.71, $p < .01$, $\eta^2 = .01$, but not within a prevention focus, F (1, 152) = .69, *ns,* and a significant effect of self-regulatory focus within a specific exemplar, F (1, 152) = 4.83, $p < .03$, $\eta^2 = .03$, but not within an abstract exemplar, F (1, 152) = 2.94, *ns*.

Figure 4.2

Interaction effect of Self-regulatory Focus and Exemplar Presentation on Creativity



Mediation Analysis

Imitation was positively correlated with creativity (r = .44, p < .001). To test whether imitation served as a partial mediator for the interaction of self-regulatory focus and exemplar presentation on creativity (Hypothesis 3), we conducted a series of regressions in order to put this to the test following Baron and Kenny's (1986) procedure. We dummy-coded self-regulatory focus and exemplar presentation (-0.5 for promotion and for an abstract exemplar; +0.5 for prevention and for a specific exemplar, respectively), computed the cross-products for the two-way interactions, and entered all factors into the equation (Aiken & West, 1991). We met the first condition for mediation via a significant self-regulatory focus X exemplar presentation interaction on imitation, β = .67, p = .05. We met the second condition via a significant self-regulatory focus X exemplar presentation interaction on creativity, β = .95, p = .01. Third, adding imitation to the model led to a drop in β size of the effect of self-regulatory focus X exemplar presentation on creativity, β = .67, p < .04, in favor of a significant effect of imitation on creativity, β = .43, p < .001. A Sobel test revealed that this indirect effect was significant, z = 2.54, p < .01. We thus found evidence for Hypothesis 3 that imitation partially mediates the relation between self-regulatory focus and exemplar presentation on creativity.

Discussion

The purpose of the present study was to deepen our understanding in the role of imitation in creative idea generation in consideration of people's self-regulatory focus and characteristics of creative exemplars. Limited research suggested that self-regulatory focus in general differentially influences the scope of attention paid to abstract and specific information (Semin et al., 2005). Our

research clearly indicated that these factors affect the idea generation process as a whole in such a way that idea generation may benefit from imitation of a creative exemplar that inspired another's performance.

In the present study, we found support for Hypothesis 1, which predicted a significant interaction effect of one's self-regulatory focus and exemplar presentation on imitation. Promotion-focused people displayed more imitation in the presence of an abstract than a specific creative exemplar. This finding is consistent with a literature theorizing (Förster et al., 2004; Förster et al., 2006) and showing (Semin et al., 2005) that abstraction better fits people with a promotion focus than specificity. However, we found that prevention-focused people displayed relatively high levels of imitation in the presence of a specific as well as an abstract creative exemplar, and thus could not confirm that specificity better fits people with a focus on prevention. The finding that such people apparently focus on a creative exemplar irrespective of its specificity or abstraction is more in line with a literature suggesting that an important consequence of a prevention-focused processing style may be a heightened alertness to information in the environment (Aaker & Lee, 2001; Aaker et al., 2000; Lockwood et al., 2002; Semin et al., 2005). Motivated by a need to avoid making mistakes, prevention-focused people apparently display imitation in the presence of creative exemplars regardless of their mode of presentation.

We further found confirmation for our Hypothesis 2, which predicted an interactive effect of self-regulatory focus and exemplar presentation on creativity. People with a promotion focus displayed more creativity of an abstract than of a specific creative exemplar, which confirms that also in creativity settings abstraction better fits promotion-focused people than specificity. Our results suggested that prevention-focused people relied on specific as well as abstract creative exemplars in creative idea generation. These results extend the literature

on the effects of self-regulatory focus that suggests that a promotion focus is more beneficial to creative performance than a prevention focus (Crowe & Higgins, 1997; Friedman & Förster, 2001, 2005; Higgins, 1997). This prior conclusion may be largely based on the fact that this literature does not account for creativity in the face of exemplars. Our findings indicate that in the presence of a creative exemplar, the outcome of idea generation depends on self-regulatory focus and presentation of a creative exemplar in terms of abstraction or specificity. Along similar lines, our findings qualify conclusions from a line of research suggesting that thinking in abstract terms yields more novelty in idea generation than thinking in specific terms (Förster et al., 2004; Ward et al., 2002; Ward et al., 2004). Our findings suggest that the overall level of novelty in idea generation depends on self-regulatory focus and the way in which a creative exemplar is presented.

We also found evidence for our Hypothesis 3 that imitation is a partial mediator of the interaction of self-regulatory focus and exemplar presentation on creativity. It was found that the higher the level of imitation in idea generation, the higher the level of creativity. This is in line with suggestions in the literature (Bandura, 1986; Marsh et al., 1996; Shalley & Perry-Smith, 2001) and in organizational practice (Hargadon, 2002; Hargadon & Douglas, 2001; Hargadon & Sutton, 1997; Sutton & Hargadon, 1996) that imitation under some conditions may positively influence creative performance. While acknowledging that people always have the possibility not to rely on a creative exemplar in idea generation, our findings seem to prove that it may be beneficial to explicitly rely upon a creative example as a guideline for the generation of appropriate solutions to a problem in creative idea generation settings, in which quantity is believed to breed creative quality, and in which the initial purpose is not as much to come up with a single product (Osborn, 1963; Diehl & Stroebe, 1987; Parnes & Meadow, 1959).

The present research makes a contribution to the domain of creativity research. Because scholars primarily focus on the generation of radically novel products or ideas (e.g., Amabile, 1996; Mandler, 1995; Shalley et al., 2004; Smith et al., 1995), they have largely overlooked the possibility of creative idea generation in the face of creative exemplars leading to imitation (Reeves & Weisberg, 1993). Our study makes clear that people may also decide to pay attention to creative exemplars and come up with ideas that to some extent resemble existing models, depending on the structural characteristics of available exemplars. Our research reveals that explicitly drawing on creative examples may sometimes be beneficial for the level of creativity in idea generation. This is in line with suggestions in the literature (Bandura, 1986; Marsh et al., 1996; Shalley & Perry-Smith, 2001), even though it may be that this positive effect is limited to idea generation tasks in which a large number of appropriate ideas may always contain a few promising ones to further explore in greater detail.

Along similar lines, the present research makes a contribution to regulatory focus theory by extending its range of possible applications. Whereas the self-regulatory focus perspective on creative task performance so far was derived from studies which did not account for the role of exemplars in the creative process (Crowe & Higgins, 1997; Friedman & Förster, 2001, 2005; Higgins, 1997), our study adds to emerging evidence that one's self-regulatory focus differentially motivates people to pay attention to creative exemplars, and the extent to which they which come up with more novel or more imitative output (Rook & van Knippenberg, 2006). It would be worthwhile further investigating such issues in greater detail while more thoroughly acknowledging the role of exemplars of other's performance in the creative process. Importantly, this implies that for a more thorough understanding we should consider the possibility to

include creative exemplars in research designs aimed at the study of motivational underpinnings of creative performance.

It would be of practical relevance to apply the present analysis to the management of innovation. Based on the assumption that creative performance is of key importance for organizations (e.g., Shalley et al., 2004), the subsequent focus of attention for managerial practice mostly has been on facilitating the production of radical novelty (Unsworth, 2001). However, it may in organizational practice often be the case that creative problems require more average rather than radically novel solutions (Förster et al., 2004; Ward et al., 2004). This implies that managers in product designer firms should not only facilitate the generation of radically novel ideas, but also allow for conditions that facilitate the generation of imitative ideas, especially in the light of our analysis that imitation may also positively contribute to the level of creativity in idea generation. From that perspective, our research seems to indicate the importance of managing the creative process with mindfulness – that is, with an awareness that not only designers' self-regulatory foci on promotion or prevention may differentially steer the outcome of creative idea generation, but also that structural characteristics of creative exemplars, such as their presentation in specific or abstract terms may differentially affect creative task performance. It seems particularly relevant for the management of innovation to carefully guide designers' and/or engineers' actions with the help of such a 'toolbox', in order to steer creative performance in the desired direction (Baron & Ward, 2004; Mitchell, Busenitz, Lant, McDougall, Morse, & Smith, 2002).

Of course, our research also has some limitations. First of all, we limited our attention to the process of idea generation as such, whereas creative task performance as a whole consists of many sequences following the initial generation of an idea (Csikszentmihalyi, 1999; Osborn, 1963; Simonton, 1999;

Weisberg, 1995; West, 2002). Second, our experiment was conducted in the lab and did not involve creative professionals in an actual organizational setting. Even though experimental studies aim at establishing causality with a high level of internal validity and are not conducted to establish external validity (Brown & Lord, 1999; Mook, 1983), this may raise the question whether the same relationships may also be observed in organizational settings. In particular, the process of creative idea generation in organizational practice is not a one-off event – that is, people can learn through experience (e.g., Sutton & Hargadon, 1996) and through (re)combination of knowledge (e.g., Hargadon, 2002). In related fashion, we exposed people to a single creative exemplar, whereas creative professionals in their daily job are constantly exposed to multiple examples. Exposure to a greater number of examples may thus yield different results (Marsh et al., 1996). Finally, our findings have been derived from a single study. Nevertheless, it has been suggested that "experimental research is generalized on the basis of the theoretical relationships that are tested, not through the concrete results of a single study" (Driskell & Salas, 1992, p. 113).

It would thus be an interesting avenue for future research to also test our findings in the field. Imitation seems to be a pervasive phenomenon underlying professionals' creative performance in creative industries (Hargadon, 2002; Hargadon & Sutton, 1997) and underlying their organizational brainstorming procedures (Sutton & Hargadon, 1996). Moreover, several studies drawing on regulatory focus theory (Benjamin & Flynn, 2006; Brockner & Higgins, 2001; Kark & Van-Dijk, 2007) have recently shown that organizational cultures in general may be more focused on promotion or prevention, and hereby suggest that findings from the lab tend to generalize to the field – just as evidence more generally suggests that findings from lab research tend to generalize to the field (Dipboye, 1990; Locke, 1986; van Knippenberg & van Knippenberg, 2005). It

seems therefore reasonable to expect that the present findings may also obtain in organizational settings.

In conclusion, we hope that the present research advances our understanding of idea generation in the face of exemplars, and offers fertile ground for the exploration of similar and related avenues in future research into the motivational underpinnings of imitation and creativity in idea generation. Given the frequency of imitative and creative behavior in organizational practice, however, we should strive not only to concentrate our research endeavors on the ins-and-outs of self-regulatory focus alone, but also to control for the powerful role that contextual factors such as creative exemplars may play in the process.

5.

Imitation in Creative Task Performance: General Discussion

Copying the behavior of others is such a central capacity in mankind (e.g., Tomasello, Savage-Rumbaugh, & Kruger, 1993; Whiten, Horner, Litchfield, & Marshall-Pescini, 2004) that imitation of the creative products and/or ideas of others also should be an essential ingredient in creative task performance. Much biographical evidence on creative professionals (e.g., Ackerman, 2002; Cowling, 2002a, 2002b; Daix, 1993; Haug & Wachinger, 1993), in conjunction with research on imitation in management literature (e.g., Hargadon, 2002; Hargadon & Sutton, 1997; Sutton & Hargadon, 1996) and in diffusion studies (e.g., Abrahamson & Rosenkopf, 1993, 1997; Henrich, 2001; Henrich & Gil-White, 2001; Rogers, 2003; Valente, 1995) highlighted the role of imitation in the creative process. However, previous studies had hardly concentrated on psychological determinants and/or motivational underpinnings of imitation in creative task performance. The main objective of the present dissertation, therefore, was to show that imitation is a component of creative task performance, which differs from creativity in its reliance upon exemplars of other's creative performance, and which sometimes is negatively, but other times positively related to creativity. The research reported in this dissertation shows that this is indeed the case, and hereby filled an existing gap in the behavioral literature on creativity and innovation.

In this concluding chapter, the following issues will be addressed: (a) a summary of the main findings of each individual chapter of this dissertation, (b) the implications and contributions of the present research, and (c) the limitations and directions for future research. The chapter will end with an overall conclusion.

Summary of the Main Findings

The aim of the studies reported in Chapter 2 was to demonstrate that imitation is a component of creative task performance characterized by a particular reliance upon exemplars of other's creative performance. It was assumed that factors such as performance of other, task difficulty, and social comparison orientation influenced the likelihood for imitation to occur.

Supporting predictions, in a preliminary study it was found that performance of other and task difficulty lead to imitation in creative tasks. Moreover, the addition of a control group in the design confirmed the phenomenon of design fixation, which refers to the fact that people always to some extent rely on creative exemplars when confronted with the performance of others (Jansson & Smith, 1991; Smith, Ward, & Schumacher, 1993). Also, it was found that creativity is not driven by performance of other, and only reduced by task difficulty. This confirmed previous research suggesting that in difficult creative tasks, people have to deal with the uncertainty that is inherent to creative task performance as such – that is, there are no straightforward solutions toward a creative problem (Amabile, 1996). In the main study, an individual-difference measure for comparison orientation for abilities (COA) (Gibbons & Buunk, 1999) was incorporated to examine whether the aforementioned processes could be explained in terms of social comparison. Again, supporting predictions, performance of others and task difficulty had a positive effect on imitation in

creative tasks. Also, as predicted, especially people with high COA showed more imitation when performance of other was high than when performance of other was low. Even though the notion that the effect of task difficulty on imitation would be stronger for people high on COA could not be proven in general, the study seemed to reveal a pattern indicating that task difficulty led to more imitation for people with high COA. People high on COA, on the other hand, did not display much imitation in simple tasks. Even though they probably still engaged in comparisons, they decided not to display much imitation. This was in line with the core assumption underlying this chapter that social comparison may set the stage for imitation, but should not be equated with imitation.

The aim of the study reported in Chapter 3 was to show that reliance upon exemplars of another's creative performance is motivationally embedded in such a way that one's self-regulatory focus differentially influences creative task performance, sometimes leading to imitation, but other times to creativity. It was assumed that factors such as the quality of performance of other and one's self-regulatory focus differentially influenced creative task performance.

Supporting predictions, it was found that promotion-focused people tend to copy an exemplar of another's high performance, whereas prevention-focused people show a tendency to imitate an exemplar of the low performance of others. Even though this seems counterintuitive, it is consistent with the aforementioned literature on design fixation suggesting that exposure to any creative exemplar causes conformity to that exemplar (Jansson & Smith, 1991; Smith et al., 1993). For creativity, as predicted, promotion-focused people displayed limited creativity in the presence of an exemplar of other's high creative performance, but showed more creativity in the presence of an exemplar of another's low performance. In contrast, prevention-focused people displayed more creativity in the presence of high rather than low performance of other. Once more, these results are consistent

with the body of research on design fixation, and seem to constitute first evidence that the presence of a creative exemplar of other's successful performance seems less harmful for the creative task performance of prevention-focused than for promotion-focused people. Finally, we found first evidence for a pattern of creative task performance which is often theoretically assumed in research in which creativity is defined in terms of level of novelty (e.g., Marsh, Landau, & Hicks, 1996; Shalley & Perry-Smith, 2001), but never explicitly empirically tested – that is, creativity benefits from conditions under which imitation is less likely to occur. This leads us to conclude that once we know to what extent people engage in imitation, we are better able to predict and explain how creative people will be in their task performance. This effect, though, may particularly occur when people produce a single creative product that is predominantly judged in terms of the level of novelty it contains: if the final product appears to be of moderate instead of radical novelty due to copying bits and pieces of an example, the piece will most likely be labelled as "being of limited creativity". In this chapter, also the role of COA was once more explored. It was found that the effect of quality of the performance of other and self-regulatory focus on imitation especially holds for people low on COA, whereas people high on COA apparently made comparisons with another's creative performance regardless of their self-regulatory focus. This replicates the finding reported in the second chapter that the quality of performance of other influences imitation in creative task performance, and that this influence in general is stronger for people that are more prone to social comparison.

The aim of the study reported in Chapter 4 was to more closely examine the role of imitation in creative idea generation in consideration of individual differences in self-regulatory focus and characteristics of a creative exemplar. It was proposed that factors such as someone's self-regulatory focus on promotion or

prevention and exemplar presentation in terms of abstraction or specificity interact to influence creative idea generation such that idea generation may benefit from imitation of a creative exemplar.

Supporting predictions, it was found that promotion-focused people display more imitation in the presence of an abstract than a specific creative exemplar, which confirms a body of research suggesting that abstraction better fits people with a promotion focus than specificity (Förster et al., 2006; Semin et al., 2005). Also, we found that prevention-focused people display relatively high levels of imitation in the presence of a specific as well as an abstract creative exemplar. Because an important consequence of a prevention-focused processing style may be a heightened alertness to environmental information (Aaker & Lee, 2001; Aaker et al., 2000; Semin et al., 2005), such people apparently display imitation in the presence of creative exemplars regardless of their mode of presentation. Also, as predicted, it was found that promotion-focused people display more creativity of an abstract than of a specific creative exemplar, which once more confirms that abstraction better fits people with a promotion focus. Prevention-focused people relied on specific as well as abstract creative exemplars in creative idea generation. These results extend the literature on the effects of self-regulatory focus that suggests that a promotion focus is more beneficial to creative performance than a prevention focus (Crowe & Higgins, 1997; Friedman & Förster, 2001, 2005; Higgins, 1997). Our findings indicate that in the presence of a creative exemplar, the outcome of idea generation depends on self-regulatory focus and characteristics of a creative exemplar. Similarly, our findings qualify conclusions from a line of research suggesting that thinking in abstract terms yields more novelty in idea generation than thinking in specific terms (Förster et al., 2004; Ward et al., 2002; Ward et al., 2004). Our findings suggest that the overall level of novelty in idea generation depends on self-regulatory focus and the

characteristics of a creative exemplar. Finally, it was found that the higher the level of imitation in idea generation, the higher the level of creativity. This is in line with suggestions in the literature (e.g., Estes & Ward, 2002; Hargadon, 2002; Marsh et al., 1996; Shalley & Perry-Smith, 2001) that imitation under some conditions may positively influence creative performance. Even though people always have the possibility not to rely on a creative exemplar in idea generation, our findings seem to show that it may be beneficial to use a creative example as a guideline for the generation of appropriate solutions to a problem in creative idea generation settings, in which quantity is believed to breed creative quality, and in which the initial purpose is not as much to come up with a single product (Osborn, 1963; Diehl & Stroebe, 1987; Parnes & Meadow, 1959).

Contributions and Implications

In this section, the contributions and implications of the present research will be reported. First, these issues will be discussed for the topic of imitation in creative task performance in general. Next, these issues will be addressed for several theoretical frameworks in particular. Finally, the implications of the present research for organizational practice will be discussed.

The main contributions of the research reported in this dissertation are twofold: First, this research shows the importance of imitation as a vital component of creative task performance. So far, imitation research addressed comparative (e.g., Tomasello et al., 1993), developmental (Meltzoff & Prinz, 2002), and social learning (e.g., Bandura, 1971, 1977; Miller & Dollard, 1941) topics, and collected empirical data on imitation of animals (e.g., Pepperberg, 1999), infants (e.g., Meltzoff, 1988, 1995), and school-age children (e.g., Bandura, Ross & Ross, 1963a, 1963b). Notwithstanding the fact that art historical

biographies and many organizational studies (e.g., Abrahamson & Rosenkopf, 1993, 1997; Dahlin & Behrens, 2005; Hargadon, 2002; Hargadon & Sutton, 1997; Henrich, 2001; Henrich & Gil-White, 2001; Lieberman & Asaba, 2006; Rogers, 2003; Schulz, 2001; Sutton & Hargadon, 1996; Valente, 1995) seemed to point to the importance of imitation for creativity and innovation, little empirically-based knowledge existed about psychological determinants and motivational underpinnings of imitation in creative settings. The present research managed to fill this void by providing a conceptual and empirical starting point for the study of imitation in creative task performance based on an understanding of imitation as goal-directed behavior in which people tend to selectively copy as well as modify exemplars of the creative performance of others.

Second, and closely related to the above, the research reported in this dissertation contributes to the domain of creativity research. Most scholars in creativity research largely ignored the topic of imitation in creative tasks due to the fact that they limited their focus of attention to the benefits of originality while overlooking the role of exemplars in creative task performance (e.g., Smith, Ward, & Finke, 1995). Because ideas and products were considered creative only if they "are unique relative to other ideas currently available" (Shalley, Zhou, & Oldham, 2004, p. 934; see also Amabile, 1996; Mumford & Gustafson, 1988; Sternberg & Lubart, 1999), the influence of models in creative tasks was understood as a constraint to creative behavior (Jansson & Smith, 1991; Shalley & Perry-Smith, 2001; Smith et al., 1993; Ward et al., 2004). That is, if people would engage in imitation of an exemplar of another's creative performance, their behavior or performance would be considered less creative than in case they would have ignored the example and would have produced something radically novel. Unfortunately, this led most scholars to simply ignore the topic of imitation in

creative task performance. However, the present research indicated that also this particular type of creative behavior should be taken seriously.

Moreover, by offering a conceptual and empirical starting point for the study of imitation in creative task performance, the present research opened the possibility to more adequately understand the fact that engagement with the performance of others in creative task settings may at times also produce something desirable. Admittedly, some creativity scholars suggested that exemplars of other's performance could serve as guidelines for appropriate creative behavior (Estes & Ward, 2002; Marsh et al., 1996; Shalley & Perry-Smith, 2001). The research reported in this dissertation, however, shed more light on this issue by pointing to the fact that this may depend on the specific requirements of a creative task. In a creative task in which creativity tends to be based on a single creative product or idea, to follow an example seems to negatively influence creative behavior, but in a creative task in which creativity tends to be defined in terms of quantity of generated ideas (e.g., Diehl & Stroebe, 1987; Osborn, 1963; Parnes & Meadow, 1959), imitation of an exemplar of another's successful creative performance seems to positively influence creativity, because the exemplar may lead the way towards the generation of a larger number of appropriate creative ideas. This implies that the strong preference among creativity researchers for the study of radically novel rather than for moderately novel products should at least to some extent be reconsidered so as to also capture the role that creative products, which clearly build on exemplars of others' past and/or present performance, play in creative performance (e.g., Cropley, 2006; Tomasello, 1999).

Building upon the above, the present research also made several more specific contributions to existing theoretical frameworks in the behavioral literature. First, notwithstanding the fact that social comparison research has gone

through many stages (Buunk & Gibbons, 1997; Buunk & Mussweiler, 2001; Kruglanski & Mayseless, 1990; Suls & Wheeler, 2000; Suls & Wills, 1991; Wood, 1989), this research managed to extend the number of applications of social comparison theory (Festinger, 1954) by showing that social comparison may also set the stage for imitation on creative tasks. In a way, to observe a creative exemplar is to copy that creative exemplar – that is, people tend to make comparisons with exemplars of the performance of other leading to imitation in creative task performance, and this influence in general is stronger for people that are more prone to social comparison. The present research thus made clear that the social comparison framework is a viable framework for understanding the subject matter. However, a social comparison perspective on imitation in creative tasks should not only need to predict social comparison, but also the outcome of that comparison. People who make comparisons with others need not necessarily engage in imitation of another's performance, because there is no one-on-one relationship between the extent to which people engage in social comparison and the extent to which they engage in imitative behavior.

Second, the present research contributes to regulatory focus theory (Higgins, 1997, 1998) by extending its range of possible applications. Building on the assumption that people differ in their motivational focus on promotion or prevention, self-regulatory focus theory had been applied to the study of creative task performance without reckoning with the potential influence of creative exemplars on the creative process. The dominant belief in the field was that a promotion focus led to more radical and daring outcomes in creative task performance, whereas a prevention focus led to more careful and vigilant outcomes (Crowe & Higgins, 1997; Friedman & Förster, 2001, 2005; Higgins, 1997). The research reported in this dissertation shows that matters may not be as straightforward. One's self-regulatory focus differentially motivates people to

generate novel products or ideas in the face of creative exemplars. An important implication, therefore, is that it seems to add value to consider the possibility to include creative exemplars in research designs aimed at the study of motivational principles underlying creative task performance – that is, in the absence of exemplars we will never be able to confirm that one's self-regulatory focus on promotion differentially influences the amount of attention paid to another's creative performance relative to one's self-regulatory focus on prevention.

Third, the present research contributes to literature using a so-called "creative cognition approach" (Smith et al., 1995). Admittedly, scholars in this line of research are the ones that have considered the role of exemplars (Jansson & Smith, 1991; Estes & Ward, 2002; Marsh et al., 1996; Marsh, Ward, & Landau, 1999; Smith et al., 1993) and many structural characteristics of creative exemplars (Förster et al., 2004; Ward, 1994; Ward et al., 2004) in creative task performance. However, beside the fact that these scholars disregard imitation as constrained creative behavior, they also have focused too heavily on the cognitive aspects of creativity that exist inside people's minds, and have failed to delve deeper into the role that other contextual factors play in the process. For example, in explaining how cognitions may have steered Picasso's creative process during the creation of his masterpiece *Guernica*, identical motives and drawings in Picasso's existing oeuvre at that time were presented as cognitive blocks that constrained the final result (Weisberg, 1995). This reading ignores the extent to which the end result drew on exemplars of the creative performance of others – among others: Ingres, Poussin and several Antique and surrealist works (Boehm, 1996; Daix, 1993). The present research adds to this literature on creative cognition by, again, stressing the fact that the creative act is not performed by an individual in isolation. It is, therefore, important of always considering the role of contextual factors such as

exemplars of another's creative performance in the study of creative task performance.

Tentatively, the case of Picasso's *Guernica* also seems to hint to a practical application of the present research to organizational practice. It is well-established that the painting was realized directly after the bombing of the city of the same name, in a period foreboding a worldwide war, and characterized by collective attempts to prevent making fatal errors and mistakes (e.g., Daix, 1993; Gilot & Lake, 1964). Because "fear and death were always powerful stimulants to Picasso" (Cowling, 2002b, p. 269), this prevention-focused societal climate surely fed into the creative process leading to the painting. In similar fashion, project managers in applied organizational setting should benefit from a more thorough understanding of the impact of organizational climate on their employees' creative task performance. It has, for instance, recently been suggested that organizational cultures may be more oriented to promotion or prevention (Brockner & Higgins, 2001; Kark & Van-Dijk, 2007). Managing a creative project in an organizational environment characterized by promotion (i.e., focused on achieving gains, wins, success) may direct the creative process towards radical invention, while managing a creative project in an organizational environment characterized by prevention (i.e., focused on avoiding failure, losses, mistakes) may yield moderate novelty. If this is true, the development of detailed knowledge on these matters seems vital for understanding the process of organizational creativity on the shop-floor so as to enable project leaders to adequately manage creative processes by facilitating an organizational climate for promotion or prevention that is in alignment with the desired types of creative performance.

Likewise, it would be relevant to apply the present analysis to innovation management. Creative performance is in general considered to be of vital importance for organizations (e.g., Amabile, 1996, Shalley et al., 2004), but the

main focus of attention so far has mostly been on facilitating the production of radical novelty (Unsworth, 2001). However, in organizational practice it may as often be the case that creative tasks require more average rather than radically novel solutions (e.g., Förster et al., 2004). Moreover, it has increasingly been suggested that creativity consists of multiple types that differ in adaptive or innovative orientation (e.g., Cropley, 2006; Kim, 2006; Kirton, 1989; Unsworth, 2001). This implies that managers in product designer firms should not only facilitate the generation of radically novel ideas, but also allow for conditions that facilitate the generation of imitative ideas. From that perspective, the research reported in this dissertation seems to indicate the importance of managing the creative process with mindfulness – that is, apart from a feeling for the abovementioned organizational climate for promotion or prevention, a project leader should be well-aware of the fact that structural characteristics of creative exemplars, such as their quality and presentation in specific or abstract terms may also differentially affect creative task performance.

Thus, if the goal of the project is to come up with a radically novel product or idea, the project leader should differently present examples of the works produced by competitors than when the goal is to more moderately invent within an existing product category. Likewise, if the goal of the project is to generate one single creative product, the project leader should better avoid imitative behavior, because this could negatively influences creative performance. On the other hand, if the goal of the project is to generate as many as possible ideas for further exploration as possible, imitation should be encouraged, because this could positively contribute to creative performance. It seems particularly relevant for the management of innovation to carefully guide designers' and/or engineers' actions towards the desired direction, perhaps even by developing some

sort of "cognitive toolbox" for managerial action (Baron & Ward, 2004; Mitchell, Busenitz, Lant, McDougall, Morse, & Smith, 2002).

Limitations and Directions for Future Research

Our research also has some limitations. To test the role of several determinants and motivations on imitation in creative task performance, a series of four experimental studies were conducted, in which participants were invited to take part in a creative task (i.e., to produce a work of art, or to generate novel ideas) in the presence of an exemplar of other's creative performance (or in the presence of an exemplar that inspired other's creative performance). The experimental setting created an opportunity to draw conclusions concerning causality and to employ relatively objective behavioral measures of imitation, as it gave us full control over what participants could observe of another's creative performance, and of the extent to which they did or did not rely upon those observations in their endeavors. However, our experiments were conducted in the lab and did not involve people in an actual organizational setting engaging in creative task performance as part of their job. This may raise questions about the generalizability of our findings. In this respect, it may be noted that experimental studies aim at establishing causality with a high level of internal validity, and are not conducted to establish external validity (Brown & Lord, 1999; Mook, 1983).

Even so, one may raise the question of whether the same relationships may also be observed in organizational settings, where people are often selected for their ability for creative performance. Moreover, the creative process in organizational practice usually is not a one-off event – that is, people can learn through experience (e.g., Hargadon & Sutton, 1997; Sutton & Hargadon, 1996) and through (re)combination of knowledge (e.g., Hargadon, 2002). In this light,

much biographical anecdotes in art history refer to the long-term character of the creative act. For instance, it took the artist Marcel Duchamp more than seven years to finish his masterpiece *The Large Glass*, and approximately four decades to finish his last work of art (Tomkins, 1998). Furthermore, exclamations such as the one by Matisse after having reworked a canvas for months: "Painting is always so difficult for me. It's always a struggle" (Cowling, 2002a, p. 28) are exemplary for the fact that the creative act rarely is a stand-alone and spontaneous action.

Similarly, in the present study we exposed people to a single creative exemplar object, whereas people in everyday practice are constantly exposed to multiple examples. For instance, in the process of revolutionary painting *Les Demoiselles d'Avignon,* Picasso not only relied on African masks – as is commonly believed (e.g., Weisberg, 1995) – but also used several Iberian stone carvings, a painting by Ingres and a few recent portraits by Matisse as examples (Cowling, 2002a, 2002b). Perhaps, following the case of *Les Demoiselles* it may even be more adequate to assume that exposure to multiple examples leads to significantly more novelty in generated output than exposure to a single example. Anyway, exposure to a greater number of examples may thus lead to different results (Marsh et al., 1996). Nonetheless, it is worthwhile more carefully considering the role of multiple exemplars on the amount of generated novelty in future studies into the subject matter. Moreover, given the increasing evidence for the existence of a fit between one's regulatory mode and the way in which someone engages in the process of doing things (e.g., Avnet & Higgins, 2003, 2006; Higgins, 2000; Kruglanski, 2006), in conjunction with recent proposals on the existence of an organizational climate for promotion or prevention (Brockner & Higgins, 2001), people in the presence of multiple examples of other's creative performance may always choose to compare with an exemplar that best fits their regulatory mode or climate given the circumstances.

It would thus seem highly worthwhile testing the same hypotheses in the field in future research. Imitation seems to be a pervasive phenomenon underlying professionals' performance in creative industries (Hargadon, 2002; Hargadon & Sutton, 1997; Sutton & Hargadon, 1996), and research in social comparison (e.g., Blanton, Buunk, Gibbons, & Kuyper, 1999; Huguet, Dumas, Monteil, & Genestoux, 2001; Michinov, 2005) and self-regulation (Benjamin & Flynn, 2006; Brockner & Higgins, 2001; Kark & Van-Dijk, 2007) suggests that findings from the lab tend to generalize to the field– just as evidence more generally suggests that findings from lab research tend to generalize to the field (Dipboye, 1990; Locke, 1986; van Knippenberg & van Knippenberg, 2005). It seems, therefore, reasonable to predict that the present findings may also obtain in organizational settings.

Finally, it seems of particular interest to also explore the possibility of cultural differences in the extent to which people engage in imitative or creative behavior. It is well-established that some Asian societies seem to be more oriented towards collectivism, whereas Western countries are more oriented towards individualism (Markus & Kitayama, 1991). These cultural differences may also cause some societies and countries to be more prone to imitation than others. For instance, unlike Western countries, in many Asian countries it is widely accepted that organizations in their product development activities openly copy the products, brands and ideas of others (e.g., Asaba, 1999; Lai & Zaichkowsky, 1999; Lieberman & Asaba, 2006). Moreover, cultural differences are still persistent in people's behavior in organizational context (e.g., Hofstede, 1980; Vygotsky, 1978). For instance, some research points to cultural and ethnic differences in social comparison orientation (Gibbons, Helweg-Larsen & Gerrard, 1995), in one's regulatory focus on promotion or prevention (Briley & Aaker, 2006), and in orientation towards abstraction or specificity in reasoning (Nisbett, Peng, Choi, &

Norenzayan, 2001). Because these and other psychological determinants of individual behavior seem to be firmly rooted in a broader cultural setting, it would thus be worthwhile also exploring the role of cultural differences in the occurrence of imitation and creativity in creative task performance in future research.

Conclusion

On the whole, the major strength of the research presented in this dissertation is that for the first time the role of the social psychological nature of imitation in creative task performance was demonstrated. If the present research aimed to shed light on one observation, it may well have been that in creative task performance people need not come up with radically novel ideas; they always have the possibility to rely on exemplars of another's creative performance in order to satisfactory perform a creative task. This research pointed to the powerful role that contextual factors, such as the quality of exemplars of other's performance and presentation of such exemplars in abstract or specific terms play in the creative process, while acknowledging that one's tendencies to rely upon creative exemplars and one's subsequent imitative or creative actions also depend on one's dispositions to engage in social comparison, and on one's self-regulatory focus. All in all, it is my hope that the research presented in this dissertation advances the overall understanding of imitation in creative tasks, and offers fertile ground for the exploration of similar and related avenues of future research into the determinants and motivational underpinnings of imitation in creative performance settings.

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Samenvatting

(Summary in Dutch)

Het is een zodanig vanzelfsprekend talent van mensen om de gedragingen van andere mensen na te volgen (Tomasello, Savage-Rumbaugh, & Kruger, 1993; Whiten, Horner, Litchfield, & Marshall-Pescini, 2004) dat het imiteren van de creatieve producten en/of ideeën van anderen ook een essentieel ingrediënt in creatief gedrag zou moeten zijn. Veel biografieën van beroemde schrijvers en kunstenaars benadrukken dat imitatie inderdaad een belangrijke rol speelt in het creatieve proces (Ackerman, 2002; Cowling, 2002a, 2002b; Daix, 1993; Haug & Wachinger, 1993) en ook wetenschappelijke onderzoeken in de bedrijfskunde (zoals gevalsstudies bij gerenommeerde ontwerpbureaus en studies naar de verspreidingspatronen van innovaties) lijken dit beeld te bevestigen (Abrahamson & Rosenkopf, 1993, 1997; Hargadon, 2002; Hargadon & Sutton, 1997; Henrich, 2001; Henrich & Gil-White, 2001; Rogers, 2003; Sutton & Hargadon, 1996; Valente, 1995). Om deze redenen is het vreemd dat wetenschappers zich niet tot

nauwelijks systematisch hebben beziggehouden met onderzoek naar de psychologische determinanten en motivationele processen die aan imitatie op creatieve taken ten grondslag liggen. De centrale doelstelling van deze dissertatie was dan ook om te laten zien dat imitatie een belangrijk onderdeel vormt van het creatieve proces op een manier die duidelijk van een op het scheppen van originaliteit gerichte benadering verschilt in haar oriëntatie op voorbeelden van andermans creatief gedrag, met als gevolg dat imitatie soms negatief en soms positief aan creativiteit is gecorreleerd.

De doelstelling van de studies die in Hoofdstuk 2 worden gerapporteerd was om aan te tonen dat imitatie een onderdeel is van creatieve taakprestaties dat wordt gekenmerkt door een specifieke steun op voorbeelden van andermans creatief gedrag. De verwachting werd geformuleerd dat factoren zoals de kwaliteit van andermans creatieve prestatie, taakmoeilijkheid en iemands sociale vergelijkingsoriëntatie de mate beïnvloeden waarin imitatie zal optreden.

In overeenstemming met de voorspellingen werd in een verkennende studie gevonden dat de kwaliteit van andermans creatieve prestatie en taakmoeilijkheid de kans vergroten dat mensen overgaan tot imitatie op creatieve taken. Sterker, de toevoeging van een controlegroep aan het onderzoeksontwerp maakte het mogelijk om het fenomeen van “design fixation” te vinden. Dit verschijnsel verwijst naar het feit dat mensen zich altijd in zekere mate verlaten op creatieve voorbeelden wanneer zij geconfronteerd worden met de prestaties van anderen (Jansson & Smith, 1991; Smith, Ward, & Schumacher, 1993). Ook werd gevonden dat creativiteit op zich niet wordt aangestuurd door de kwaliteit van andermans creatieve prestatie, en slechts wordt gereduceerd door taakmoeilijkheid. Dit resultaat bevestigde wetenschappelijk onderzoek waarin werd gesuggereerd dat mensen in moeilijke taakomstandigheden geconfronteerd worden met een onzekerheid die inherent is aan creatieve taken – de onzekerheid

dat er geen eenduidige oplossingen bestaan voor een creatief probleem (Amabile, 1996).

In de hoofdstudie werd een individuele verschilmaat voor sociale vergelijkingsoriëntatie op bekwaamheden ("comparison orientation for abilities" ofwel COA) (Gibbons & Buunk, 1999) toegevoegd aan het onderzoeksontwerp om te bestuderen in welke mate bovenstaande processen konden worden verklaard vanuit een sociale vergelijkingsperspectief. Wederom werd in overeenstemming met de voorspellingen gevonden dat de kwaliteit van andermans prestatie en taakmoeilijkheid een positief effect hadden op imitatie in creatieve taken. Zoals voorspeld werd eveneens gevonden dat mensen met een hoge mate van COA vooral meer imitatie vertoonden in die gevallen waarin de kwaliteit van andermans prestatie hoog was in plaats van laag. Hoewel de veronderstelling dat het effect van taakmoeilijkheid op imitatie groter zou zijn voor mensen die gekenmerkt worden door een hoge mate van COA als zodanig niet kon worden aangetoond, liet de studie een patroon zien dat op zijn minst deze suggestie wekte. Echter, personen met een hoge mate van COA vertoonden weinig imitatie in een simpele taak. Het ligt voor de hand dat zij zich in dergelijke omstandigheden waarschijnlijk nog steeds bezighielden met sociale vergelijkingprocessen, maar desondanks besloten om niet tot nauwelijks tot het imiteren van een creatief voorbeeld over te gaan. Dit laat zien dat sociale vergelijkingsprocessen dus de kans op imitatie vergroten, maar niet noodzakelijkerwijze daartoe leiden.

De doelstelling van de studie die in Hoofdstuk 3 wordt gerapporteerd was om aan te tonen dat het zich baseren op voorbeelden van andermans creatieve prestatie in een creatieve taak voor een groot gedeelte verankerd ligt in iemands motivationele oriëntatie, en wel op dusdanige wijze dat iemands promotie- of preventiefocus op zelfregulatie de prestatie in een creatieve taak aanstuurt – soms in de richting van imitatie en dan weer in de richting van creativiteit. Het lag dan

ook in de lijn der verwachting dat factoren zoals de kwaliteit van andermans creatieve prestatie en iemands focus op zelfregulatie de prestaties op een creatieve taak verschillend beïnvloeden.

In overeenstemming met de voorspellingen werd gevonden dat personen met een promotiefocus het voorbeeld van andermans goede creatieve prestatie kopieerden, terwijl personen met een preventiefocus de neiging hadden om een voorbeeld van andermans slechte creatieve arbeid te imiteren. Hoewel dit laatste tegen het gevoel indruist, is het consistent met de eerdergenoemde studies naar "design fixation", het verschijnsel dat blootstelling aan welk creatief voorbeeld dan ook leidt tot conformiteit richting dat voorbeeld (Jansson & Smith, 1991; Smith et al., 1993). Wat creativiteit betreft, vertoonden personen met een promotiefocus geheel in lijn der verwachting gematigde creativiteit in de aanwezigheid van een voorbeeld van andermans hoogstaande creatieve arbeid, maar meer creativiteit in de aanwezigheid van een voorbeeld van andermans matig creatieve prestatie. Echter, personen met een preventiefocus lieten meer creativiteit zien in aanwezigheid van andermans hoogstaande dan in aanwezigheid van andermans matig creatief gedrag. Deze resultaten zijn wederom consistent met onderzoeken naar "design fixation", en lijken een eerste bewijs te bieden dat de aanwezigheid van een creatief voorbeeld van andermans succesvolle prestatie minder schadelijk is voor de prestaties op creatieve taken van op preventie georiënteerde mensen dan voor de prestaties van op promotie gerichte mensen. Wij vonden ten slotte een eerste bewijs voor een patroon van creatief presteren dat vaak theoretisch wordt verondersteld in onderzoeken waarin creativiteit wordt gedefinieerd in termen van originaliteit (bv. Marsh, Landau, & Hicks, 1996; Shalley & Perry-Smith, 2001), maar tot nu toe nooit expliciet werd getoetst – namelijk dat creativiteit gebaat is bij condities waarin imitatie in mindere mate optreedt. Dit lijkt de conclusie te rechtvaardigen dat wanneer wij begrijpen in

welke mate mensen zich met imitatie inlaten, wij beter in staat zijn om te voorspellen en te verklaren hoe creatief mensen zullen zijn in hun doen en laten. Echter, dit effect zal vooral optreden wanneer mensen één enkel creatief product genereren dat hoofdzakelijk wordt beoordeeld op de mate van de originaliteit die het bevat. Als het eindproduct van gemiddelde in plaats van radicale originaliteit is (omdat het gekopieerde elementen van een voorbeeld bevat) wordt het product hoogstwaarschijnlijk gekarakteriseerd als "van matig creatief niveau". In dit hoofdstuk werd ook de rol van COA nogmaals bestudeerd. Gevonden werd dat het effect van de factoren kwaliteit van andermans creatieve prestatie en focus op zelfregulatie op imitatie vooral geldt voor mensen die laag op COA scoren, terwijl personen die worden gekenmerkt door een hoge mate aan COA zich klaarblijkelijk in elk geval met andermans creatieve prestatie vergeleken – los van hun focus op zelfregulatie. Dit vormt een replicatie van het resultaat dat in Hoofdstuk 2 werd gerapporteerd, namelijk dat de kwaliteit van andermans creatieve prestatie een invloed heeft op imitatie op creatieve taken en dat deze invloed over het algemeen groter is voor mensen die een grotere neiging hebben om zich sociaal te vergelijken.

De doelstelling van de studie die in Hoofdstuk 4 wordt gerapporteerd was om de rol van imitatie in creatieve ideegeneratie te onderzoeken met betrekking tot verschillen in iemands focus op zelfregulatie en kenmerken van een creatief voorbeeld. Het lag in de lijn der verwachting dat factoren zoals focus op zelfregulatie (iemands focus op promotie of preventie) en presentatie van een creatief voorbeeld op een abstracte of meer concrete manier zodanig met elkaar interacteren dat men in creatieve ideeontwikkelingsprocessen soms kan profiteren van het kopiëren van een creatief voorbeeld.

In overeenstemming met de voorspellingen werd gevonden dat personen met een promotiefocus meer imitatie vertoonden in de aanwezigheid van een

abstract dan van een specifiek voorbeeld. Dit bevestigde een lijn van wetenschappelijk onderzoek waarin wordt gesuggereerd dat abstractie beter past bij mensen met een promotiefocus dan specificiteit (Semin, Higgins, de Montes, Estourget, & Valencia, 2005). Ook werd gevonden dat personen met een preventiefocus zowel relatief veel imitatie vertoonden in de aanwezigheid van een abstract als in de aanwezigheid van een specifiek creatief voorbeeld. Omdat een verhoogde waakzaamheid ten aanzien van informatie in de omgeving een belangrijke consequentie lijkt te zijn van een op preventie georiënteerde verwerkingsstijl (Aaker & Lee, 2001; Aaker, Lee, & Gardner, 2000; Lockwood, Jordan, & Kunda, 2002; Semin et al., 2005), vertonen zulke mensen klaarblijkelijk imitatie in de aanwezigheid van een creatief voorbeeld ongeacht hun specifieke focus op zelfregulatie. Ook werd, zoals verwacht, gevonden dat op promotie gerichte personen meer creativiteit lieten zien in de aanwezigheid van een abstract dan in de aanwezigheid van een specifiek voorbeeld. Dit bevestigde wederom dat abstractie beter past bij op promotie gerichte personen dan specificiteit. Personen met een preventiefocus verlieten zich in creatieve ideeontwikkeling zowel op abstracte als op concrete voorbeelden. Deze resultaten mogen worden opgevat als een uitbreiding van een wetenschappelijke onderzoekslijn die zich bezighoudt met de effecten van focus op zelfregulatie, en die staande houdt dat een promotiefocus beter is voor creativiteit dan een preventiefocus (Crowe & Higgins, 1997; Friedman & Förster, 2001, 2005; Higgins, 1997). Onze resultaten wijzen uit dat de uitkomst van creatieve ideegeneratie in de aanwezigheid van een creatief voorbeeld afhankelijk is van iemands focus op zelfregulatie en de kenmerken van een creatief voorbeeld. Tevens lijken onze resultaten de conclusie te rechtvaardigen dat het denken in abstractie tot meer vernieuwing in ideeontwikkeling leidt dan denken in specifieke termen (Förster, Friedman, & Liberman, 2004; Ward, Patterson, Sifonis, Dodds, & Saunders, 2002; Ward,

Patterson, & Sifonis, 2004). Deze studie suggereert dat het algemene gehalte aan noviteit in ideeontwikkeling afhankelijk is van iemands focus op zelfregulatie en van de kenmerken van een creatief voorbeeld.

Ten slotte werd gevonden dat hoe hoger het gehalte aan imitatie in ideegeneratie, hoe hoger het gehalte aan creativiteit. Dit bevestigt een onderzoekstraditie (Estes & Ward, 2002; Hargadon, 2002; Marsh et al., 1996; Shalley & Perry-Smith, 2001) waarin de stelling wordt geponeerd dat imitatie in sommige gevallen een positief effect op iemands creatieve prestaties kan hebben. Hoewel mensen in hun ideeontwikkelingsproces altijd de gelegenheid hebben om zich níet op een creatief voorbeeld te oriënteren, laten onze resultaten zien dat het wel degelijk een positieve bijdrage aan het creatieve proces kan leveren om een creatief voorbeeld in te zetten als richtlijn voor het genereren van toepasselijke en adequate oplossingen voor een creatief probleem. Dit laatste lijkt vooral het geval in situaties waarin hoeveelheid wordt verondersteld tot creatieve kwaliteit te leiden, en waarin de aanvankelijke doelstelling niet zozeer is om één enkel creatief product te ontwikkelen, maar om te komen tot een reeks interessante creatieve ideeën (Osborn, 1963; Diehl & Stroebe, 1987; Parnes & Meadow, 1959).

In Hoofdstuk 5 worden op basis van de gerapporteerde studies de belangrijkste conclusies getrokken en voorzien van wetenschappelijk en praktisch relevante implicaties. In dit proefschrift werd voor het eerst de sociaal psychologische rol van imitatie in creatieve taken aangetoond. De centrale boodschap daarbij was dat mensen in hun creatieve activiteiten helemaal niet met radicaal originele ideeën en/of producten hoeven te komen om succesvol te zijn; ze kunnen zich altijd verlaten op voorbeelden van andermans creatieve arbeid om een creatieve taak op bevredigende wijze te vervullen. In dit onderzoek werd de krachtige rol in dit proces onderkend van contextuele factoren zoals de kwaliteit van voorbeelden van andermans creatieve arbeid en presentatie van dergelijke

voorbeelden op een abstracte en/of concrete manier, terwijl ook rekening werd gehouden met het feit dat iemands neiging tot het zich baseren op creatieve voorbeelden en de mate waarin men als gevolg daarvan tot imitatie dan wel originaliteit overgaat, afhankelijk is van iemands neiging om zich sociaal met anderen te vergelijken, en van iemands specifieke focus op zelfregulatie. Concluderend hoop ik dat het onderzoek dat in dit proefschrift werd gepresenteerd niet alleen het begrip met betrekking tot het onderwerp van imitatie in creatieve setting zal vergroten, maar ook het onderwerp zozeer op de kaart van onderzoekers zal plaatsen, dat het een inspiratiebron zal vormen voor vervolgonderzoek naar de determinanten en motivationele processen die aan imitatie op creatieve taken ten grondslag liggen.

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Laurens Rook was born 1973 in Lekkerkerk, the Netherlands. In 1993, he received his Gymnasium ß diploma from the Krimpenerwaard College in Krimpen aan den IJssel. In 1997, he graduated in Fine Art (Painting) at the College of Art and Design in Rotterdam. In 2001, he graduated in Communication Studies at the University of Amsterdam. In 2002, he started his PhD project at the Rotterdam School of Management of the Erasmus University Rotterdam, where the research reported in this dissertation was conducted between 2002 and 2007. Laurens currently works as a post-doctoral researcher at the department of Organizational Behavior of Innovation at the Delft University of Technology.

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IMITATION IN CREATIVE TASK PERFORMANCE

Common wisdom has it that 'apes ape' and what 'monkey see, monkey do'. Human beings, though, by far and beyond outperform apes in their capacity for imitation. Copying the behavior of others is such a central capacity in mankind that imitation of the creative products and/or ideas of others also should be an essential ingredient in creative task performance. Much biographical evidence on creative professionals in conjunction with research on imitation in management literature highlights the role of imitation in the creative process. However, previous studies hardly concentrated on behavioral determinants and/or motivational underpinnings of imitation in creative performance settings. To fill this void, the present dissertation reports a series of four laboratory experiments to show that imitation is a component of creative task performance, which differs from creativity in its reliance upon exemplars of other's creative performance. It was found that imitation is an element of creative task performance, which is sometimes negatively, but other times positively related to creativity. Moreover, it was shown that contextual factors such as the quality of exemplars of other's performance and presentation of such exemplars in abstract or specific terms play a powerful role in the creative process, while it was acknowledged that one's tendencies to rely upon creative exemplars and one's subsequent imitative or creative actions also depend on one's dispositions to engage in social comparison, and on one's self-regulatory focus. Imitation thus is an important factor in the creative process and worthwhile to further investigate in greater detail.

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