
**SUSPICIOUS SPIRITS, FLEXIBLE MINDS:
WHEN DISTRUST ENHANCES CREATIVITY**

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ABSTRACT

Considering that distrust is a core element of human interaction, it has received surprisingly little scientific attention. This research contributes to filling this gap by investigating distrust's influence on creativity. Intuitively as well as in light of prior research, distrust and creativity appear incompatible. The social consequences of distrust include reluctance to share information, a quality detrimental to creativity in social settings. At the same time, the cognitive concomitants of distrust bear resemblance to creative cognition: Distrust seems to foster thinking about non-obvious alternatives to potentially deceptive appearances. This tendency resembles cognitive flexibility, which is conducive to creativity. These cognitive underpinnings of distrust hold the provocative implication that distrust may foster creativity. Mirroring these contradictory findings, I suggest that the social vs. cognitive consequences of distrust have diverging implications for creativity. I address this question in Study 1 by introducing private/public as a moderating variable for effects of distrust on creativity. Consistent with distrust's *social* consequences, subliminal distrust (vs. trust) priming had detrimental effects on creative generation presumed to be public. Consistent with distrust's *cognitive* consequences, though, the opposite emerged in private. Study 2 replicated a beneficial effect of distrust on private creative generation with a different priming method. Studies 3 and 4 showed increased category inclusiveness vs. increased remote semantic spread after distrust priming. The latter findings are consistent with enhanced cognitive flexibility as a consequence of distrust. Taken together, these results provide evidence for the creativity-enhancing potential of distrust and suggest cognitive flexibility as the process in question.

DEUTSCHE KURZZUSAMMENFASSUNG

Angesichts der zentralen Rolle, die Misstrauen in sozialen Interaktionen spielt, hat dieses Konzept bisher überraschend wenig wissenschaftliche Aufmerksamkeit auf sich gezogen. Die vorliegende Forschungsarbeit will mit der Untersuchung des Einflusses von Misstrauen auf Kreativität dazu beitragen, diese Lücke zu füllen. Sowohl intuitiv als auch mit Blick auf die bisherige Forschung erscheinen Misstrauen und Kreativität nur schwer miteinander vereinbar. So beinhalten beispielsweise die sozialen Konsequenzen von Misstrauen eine Zurückhaltung beim Weitergeben von Informationen. Dies wiederum wirkt sich negativ auf Kreativität in sozialen Konstellationen aus. Andererseits weisen die kognitiven Begleiterscheinungen von Misstrauen Ähnlichkeiten mit kreativem Denken auf: Misstrauen scheint dazu zu führen, dass nicht-offensichtliche Alternativszenarien zu potentiell betrügerischen Informationen generiert werden. Diese Tendenz erinnert an kognitive Flexibilität, eine für Kreativität förderliche Qualität. Die kognitiven Charakteristika von Misstrauen legen daher die provokante Schlussfolgerung nahe, dass Misstrauen Kreativität fördern könnte. In Anbetracht der widersprüchlichen Befunde gehe ich davon aus, dass die sozialen und kognitiven Konsequenzen von Misstrauen unterschiedliche Implikationen für Kreativität haben. Dieser Frage widmet sich Studie 1, die den Faktor „Öffentlichkeit“ als Moderator für die Effekte von Misstrauen auf Kreativität einführt. In Übereinstimmung mit den *sozialen* Konsequenzen von Misstrauen zeigt sich hier, dass subliminales Misstrauens- (vs. Vertrauens-)Priming negativ auf (angeblich) öffentliche Ideengenerierung wirkt. In Übereinstimmung mit den *kognitiven* Konsequenzen von Misstrauen zeigte sich jedoch ein gegenteiliger Effekt, wenn kreative Ideen nicht öffentlich gemacht wurden, sondern „privat“ blieben. Studie 2

repliziert einen förderlichen Einfluss von Misstrauen auf private Ideengenerierung mit einer anderen Primingmethode. Die Studien 3 und 4 zeigen erhöhte Inklusivität von Kategorien (*category inclusiveness*) beziehungsweise vermehrte Aktivierung von semantisch weiter entfernten Assoziationen (*remote semantic spread*) nach Misstrauenspriming. Letztere Befunde weisen auf erhöhte kognitive Flexibilität als eine Folge von Misstrauen hin. Die vorgestellten Ergebnisse sprechen dafür, dass Misstrauen kreativitätsförderliches Potenzial hat. Sie legen weiterhin kognitive Flexibilität als zugrunde liegenden Prozess nahe.

INTRODUCTION AND THEORETICAL BACKGROUND

Creativity—the generation of work that is both novel and appropriate (e.g., Sternberg & Lubart, 1999)—does not only yield esthetic art objects and enjoyable theatre performances. Creativity is called for in a vast number of other situations—from finding promising solutions for pressing political problems to coming up with new product ideas and thus sustaining a company’s economic success, to finding a not-so-everyday but rather original gift for a significant other. As these examples demonstrate, not only the arts and innovations in science or economy depend heavily on people tapping their creative potential, but more mundane problems also often demand leaving the beaten track to find creative solutions (Runco, 2004). In sum, creativity is an important and highly-valued skill for coping with many different circumstances in life. The significance of creativity in various domains is reflected in a broad scientific interest in factors that foster or hinder creative performance. Creativity has been shown not only to vary considerably between people due to enduring personality traits (e.g., Batey, Chamorro-Premuzic, & Furnham, 2010; Feist, 1998; Hennessey & Amabile, 2010), but also to depend on a wide range of more transient affective (e.g., Baas, De Dreu, & Nijstad, 2008; Davis, 2009), motivational (e.g., Amabile, 1985; Friedman & Förster, 2000), and cognitive states (e.g., Förster, Friedman, Butterbach, & Sassenberg, 2005; Förster, Friedman, & Liberman, 2004; Friedman, Fishbach, Förster, & Werth, 2003; Galinsky & Moskowitz, 2000a; Kray, Galinsky, & Wong, 2006; Markman, Lindberg, Kray, & Galinsky, 2007; Scott, Lonergan, & Mumford, 2005).

In addition to these intrapsychic variations, important *interpersonal* factors like cooperation and conflict (Carnevale & Probst, 1998; De Dreu & Nijstad, 2008) or social

power (Galinsky, Magee, Gruenfeld, & Whitson, 2008) have been studied with respect to their influence on creativity. In fact, social context might play a particularly important role in creativity. First of all, creative performance is highly desired in interactive contexts like the classroom or work teams. Furthermore, creative performance crucially depends on its social reception: An idea or a piece of work is only creative if the social environment considers it to be so (e.g., Amabile, 1982; Simonton, 1997). The work of many now famous artists and scientists was first (mis)judged as crazy or, at best, uninteresting (Runco, 1999). Taking into account the fine line between novelty and nonsense, displaying creative behavior often means going out on a limb and running the risk of social ridicule. For example, imagine yourself in a group of people playing “charade” and that it is your turn to act out a word by pantomime. How much you will let your imagination run wild will critically depend on the surrounding social environment. In the friendly and safe climate of a group of close friends, you may risk an unconventional, creative, and highly entertaining performance. Yet, in a critical or even potentially malicious environment, you will probably censor yourself much more—even if that hinders your audience in guessing correctly. As this example suggests, creative performance may be sensitive to the perceived benevolence of the social surroundings—and even more so to a lack thereof.

This interplay of expected vs. doubted benevolence and the willingness to take risks is reflected in one of the central factors shaping social context, which is captured by the concepts of *trust* and *distrust* (e.g., Schoorman, Mayer, & Davis, 2007; Simpson, 2007). When we expect others to be by and large benevolent toward us, we trust them and become willing to take risks (cf., Schoorman et al., 2007). The more we doubt benevolent intentions, however, the more risk-adverse we become. As being creative

involves a certain level of risk-taking (cf., Friedman & Förster, 2001; George & Zhou, 2007; Glover, 1977; Runco, 2007), creativity is likely to differ depending on whether spirits are trustful or suspicious. Moreover, a detrimental influence of distrust on creativity seems highly likely.

Yet, despite its overall negative connotation, distrust has recently been described as being “of value” (Schul, Mayo, & Burnstein, 2008). As I will elaborate upon in more detail later, the cognitive characteristics of a distrustful mindset cast doubt on the unilaterally detrimental influence of distrust on creativity. Rather, they resemble almost perfectly the preconditions for “thinking outside the box,” and hence for creativity. The present research set out to investigate the possibility of a creativity-*enhancing* effect of distrust.

In the following, I will first introduce the two concepts relevant to this research, namely creativity and distrust. This is followed by a brief synopsis of prior research connecting both concepts, which suggests an overall negative influence of distrust on creativity. I will then contrast this research with recent findings on the cognitive concomitants of distrust that speak to its creativity-enhancing potential. Before finally turning to the empirical studies, I will introduce a moderator holding the potential to solve the apparent contradiction between these findings.

Creativity from a Social Psychological Perspective

Merriam Webster’s online dictionary lists terms like *original*, *clever* or *ingenious* (“Creative,” n.d.) as synonyms for *creative*. These synonyms certainly constitute excellent descriptions of eminent individuals like Leonardo da Vinci, Wolfgang Amadeus Mozart, or Albert Einstein. At the same time, they also constitute

to-the-point descriptors of their respective creations, i.e., of the *Mona Lisa*, of the opera *Die Zauberflöte* (The Magic Flute), or of the *Theory of Relativity*. As these examples demonstrate, creativity can refer to characteristics of either people or products. As creative products constitute the observable instance of creativity, creative persons are fundamentally identified by their creative products. Accordingly, the creative product has played a prominent role in creativity research (Amabile, 1983). The significance of the creative product is also reflected in the scientific definition of creativity as involving “the development of a novel product, idea, or problem that is of value to the individual and/or the larger social group” (Hennessey & Amabile, 2010, p. 572).

With regard to social psychology and its strong experimental approach, the creativity of products is of particular significance. The social psychological approach focuses on how observable creative behavior varies as a function of social and environmental circumstances. Interindividual differences related to the creative personality are of interest inasmuch as they interact with social and environmental influences. De Dreu and Nijstad (2008), for example, showed that the effects of social conflict on creativity in part depend on stable interindividual differences in the need for cognitive closure (NFC; Webster & Kruglanski, 1994). The social psychological perspective further entails that everybody has the potential to be creative at least to some degree (e.g., Amabile, 1983; Hennessey & Amabile, 2010; Runco, 2007). It is further in concordance with the notion that creativity is an integral part of everyday life and not just relevant in the arts, in science, or for major business innovations (Runco & Richards, 1997). Even though when thinking about creativity, we may mostly consider outstanding masterpieces like the *Theory of Relativity* or the *Mona Lisa* (“big C creativity”, cf., Gardner, 1993), an understanding of how everyday creativity (“little c

creativity”) is influenced by social and environmental conditions is very valuable: Unlike personality traits, social and environmental conditions can be changed to better serve the emergence of creativity.

Over the past several decades, various situational variables have been explored with regard to their influence on creative performance. Situational variations often translate into variations in creative performance via changes in affective, motivational, or cognitive states (and the interplay between them). Prominent examples of social psychological research investigating the influence of such states on creativity are described in the following sections.

Affective states. With regard to the influence of affective states on creativity, findings are controversial (for recent overviews see Baas et al., 2008; Davis, 2009; Hennessey & Amabile, 2010). The long prevailing notion that positive affect fosters creativity (e.g., Davis, 2009; Hirt, Devers, & McCrea, 2008; Hirt, Levine, McDonald, Melton, & Martin, 1997; Isen, Daubman, & Nowicki, 1987) is being replaced by a more differentiated view of the relationship between mood and creativity. More specifically, recent accounts propose that the influence of a particular affective state on creativity depends not only on its hedonic tone (positive vs. negative), but also on its accompanying activation level and its properties in terms of approach vs. avoidance orientations (Baas et al., 2008; De Dreu, Baas, & Nijstad, 2008; please consult paragraph *Affective States and Approach vs. Avoidance Orientations as Alternative Explanations?* in the *General Discussion* for a more elaborated examination).

Motivational states. Other lines of research have shown that changes in motivation influence creative performance. A prominent finding indicates that situational variables influencing intrinsic task motivation affect creative performance

(cf., Hennessey & Amabile, 2010). For example, research has shown that extrinsic constraints (e.g., expected evaluation; Amabile, 1979) as well as extrinsic motivators (e.g., an expected reward; Amabile, Hennessey, & Grossman, 1986; but see also Eisenberger & Rhoades, 2001) can undermine intrinsic motivation and thereby impair creative performance. Making individuals think about intrinsic reasons for performing a task, on the other hand, can increase creative performance (Greer & Levine, 1991). Another line of research has investigated the influence of motivation in terms of approach vs. avoidance orientations (Friedman & Förster, 2000, 2001, 2002). For example, having participants perform arm flexion (approach behavior) relative to arm extension (avoidance behavior) yielded increased creativity (Friedman & Förster, 2000, 2002). Likewise, Mehta and Zhu (2009) found that participants exposed to a blue computer screen background (approach-related) performed better in a creative task than participants exposed to a red (avoidance-related) or neutral-colored screen.

Cognitive states. Situational variables further influence creative performance inasmuch as they affect cognition or processing styles relevant to creativity. For example, having participants consider alternative outcomes to a given event is associated with better creative performance (Galinsky & Moskowitz, 2000a; Kray et al., 2006; Markman et al., 2007). Furthermore, situations that foster a global rather than a local processing style have been linked to enhanced creativity (Förster, Epstude, & Özelsel, 2009; Förster et al., 2004; Friedman et al., 2003). Processing styles relevant to creativity have further been connected to certain affective and motivational states. A global processing style, for example, accompanies positive rather than negative affective states (Isbell, Burns, & Haar, 2005) and approach rather than avoidance orientations (Förster, Friedman, Özelsel, & Denzler, 2006). Many situational

influences might therefore, ultimately, exhibit their influence on creativity by evoking changes in cognition.

Reflecting this basic function, cognitive processes that lead to creative end-products have been of long-standing interest in creativity research. In this regard, the social psychological approach to creativity can be seen as in line with the *creative cognition approach* (Smith, Ward, & Finke, 1995). This approach states that creativity results from applying ordinary—rather than extraordinary or even mystical—cognitive processes. This view further implies that the underlying processes yielding “big C creativity” are essentially the same as those that yield everyday creativity (cf., Nijstad & Levine, 2007; Ward, Smith, & Finke, 1999). Various characteristics of cognitive functioning—in terms of both stable traits and more fleeting states—have been investigated regarding their relation to creativity (see Hennessey & Amabile, 2010; Runco, 2007; Simonton, 2000; Ward et al., 1999). As I propose an overlap of suspicious and creative cognition, these are of great importance for the research presented here. In terms of a general framework, I will draw on the recently introduced *Dual Pathway Model to Creativity* (DPCM; De Dreu et al., 2008) that integrates the most critical elements of creative cognition. In addition, I will refer to some characteristics of creative cognition in more detail because they relate closely to cognitive concomitants of distrust (please consult paragraph *The Creative Mind of Suspicious Spirits*). Before turning thereto, I will briefly introduce the concept of distrust as well as the existent empirical evidence connecting distrust and creativity.

Distrust—A Double-Edged Sword

Broadly defined, distrust denotes a state of mind characterized by doubts about whether appearances can be taken at face value (cf., Schul et al., 2008). It generally consists of the assessment of the (un)trustworthiness of a source and of the appearances displayed by that source (cf., Hardin, 2004). Often, distrust is seen as the complement of trust. Yet, it has been argued that a lack of trust does not necessarily imply distrust, just as the absence of distrust does not necessarily equal trust (Ullmann-Margalit, 2004). Rather, there seems to be a continuum ranging from more or less trust to more or less distrust, respectively. States of distrust (and trust) can thus differ with regard to their intensity and the ambiguity involved (Marchand & Vonk, 2005; Sinaceur, 2010). In the case of quite extreme distrust, for example, individuals would not so much doubt appearances to be true but rather they would be convinced that they are not (cf., Schul et al., 2008). To reflect these differences, Sinaceur (2010) suggested differentiating between distrust and *suspicion*, with distrust leaning towards the extreme and being considerably less ambiguous than suspicion. Yet, the continuum perspective implies a rather broad overlap between both concepts with presumably similar cognitive, affective, and behavioral implications. Mirroring this overlap, distrust and suspicion have mostly been used interchangeably (e.g., Fein, 1996; Kramer, 1998; Schul, Burnstein, & Bardi, 1996), as I do here¹. From this perspective, suspicion has rather been considered “one of the primary components of distrust” (Kramer, 1998, p. 252).

¹ The distrust-suspicion distinction is not made in the research presented here for two additional reasons: First, my studies involve unfocused distrust (cf., p. 9), which seems not to allow for a clear separation from either suspicion or distrust as proposed by Sinaceur (2010). Secondly, the German verb “*misstrauen*”—which is used as a prime in Studies 1, 3, and 4—does not clearly differentiate between the two concepts; it is a translation of both, “to distrust” and “to suspect”.

Distrust in its various manifestations constitutes a ubiquitous occurrence in everyday life (cf., Kramer, 1998), according to the high prevalence of lying and attempts at deception documented in research (e.g., DePaulo & Kashy, 1998; DePaulo, Kashy, Kirkendol, Wyer, & Epstein, 1996). As successful deception usually results in a disadvantage for the deceived person, there is good reason to try and protect oneself against deception attempts. Unfortunately, people are generally not very good at reliably distinguishing truthful from deceptive behavior (Anderson, DePaulo, & Ansfield, 2002; Anderson, DePaulo, Ansfield, Tickle, & Green, 1999; Ekman & O'Sullivan, 1991). This is true in the case of distrust as we typically imagine it—suspicion *focused* at a specific person in a particular situation. Differentiating truth from deceit might be even more challenging if people find themselves in a state of *unfocused* distrust. Unfocused distrust refers to situations in which there is reason to believe that there might be the impending danger of deception but it is unknown who is and who is not—e.g., in a group setting—a potential deceiver (cf., Schul et al., 1996). In the workplace or in school, unfocused distrust might reflect an overall distrustful climate. Furthermore, states of unfocused distrust are likely to be triggered by cues that are typically seen as being related to deception (e.g., certain facial or vocal features; see DePaulo et al., 2003; Schul, Mayo, & Burnstein, 2004; Stirrat & Perrett, 2010; Zebrowitz, Voinescu, & Collins, 1996). Alternatively, an instant of focused distrust may transfer to a subsequent, unrelated situation, and linger as unfocused distrust (cf., Schul et al., 2008).

Even though *trust* is considered to be the default when there is no reason for doubt (e.g., Berg, Dickhaut, & McCabe, 1995; McKnight, Cummings, & Chervany, 1998; cf., Gilbert, 1991), trust is quite easily destroyed and replaced by distrust instead

(cf., Cook, Hardin, & Levi, 2005): Suspicion is readily evoked by subtle cues of unreliability, by one single questionable action, or by an isolated instance of betrayal (cf., Marchand & Vonk, 2005). In contrast, for perceiving someone as truly and completely trustworthy or in order to regain a previously damaged reputation of trustworthiness, it takes substantially more evidence of honesty and reliability (cf., Gidron, Koehler, & Tversky, 1993). Distrust therefore seems quite widespread, easy to evoke, and hard to counteract (see also Fetchenhauer & Dunning, 2010). The ubiquity of distrust is often deemed problematic, as distrust is usually seen as destructive in various social contexts (e.g., Fukuyama, 1995). First and foremost, cooperation is highly likely to be impaired when trust is lacking or in the case of actual distrust (e.g., De Cremer, Snyder, & Dewitte, 2001; Kershenbaum & Komorita, 1970; Komorita & Mechling, 1967; Pruitt & Kimmel, 1977; Yamagishi, 1986; Yamagishi & Sato, 1986). Higher transaction costs are also likely to emerge as a consequence of distrust because of the felt necessity to closely monitor the behavior of the involved persons (cf., Cook et al., 2005; Kramer, 1999). Yet, how could distrust have evolved as a ubiquitous phenomenon, if it was singularly negative and destructive? The answer is that distrust is probably pictured more accurately as a “double-edged sword,” metaphorically speaking. In many contexts, distrust is not only justified but rather a highly-adaptive response to protect oneself from exploitation by untrustworthy others (Cosmides & Tooby, 2005; Kramer, 1998). To serve this vital function, distrust seems to come along with cognitive activity suitable to counteract deceptive attempts (Schul et al., 1996, 2004, 2008).

Furthermore, the ubiquity of distrust and its significance in preventing harm make it likely that an integrated mental representation has evolved, comprising

affective, cognitive, and behavioral tendencies associated with perceived deception (Cosmides & Tooby, 2005; see also Schul et al., 2008). In case of such an integrated distrust representation, even subtle cues to deception should be capable of evoking the whole mental representation, i.e., a distrust *mindset* (cf., Schul et al., 1996, 2004, 2008). I will elaborate on the cognitive concomitants of distrust in more detail later on, as they are of particular interest for the proposed creativity-enhancing potential of distrust. Before turning thereto, I will briefly review existing empirical evidence on the influence of distrust on creativity.

Suspicious Spirits in Creativity Research

Research aimed directly at the link between distrust and creativity is rather scarce and predominantly originates from organizational psychology. The mostly correlational data point to a negative effect of distrust on creativity: In a cross-country comparison, for example, Dakhli and De Clercq (2004) report lower levels of generalized trust to be related to less innovation overall. On the organizational level, Ekvall (1996) proposes: “Where trust is missing, people are suspicious of each other and are wary of making mistakes. They also are afraid of being exploited and robbed of their good ideas” (p. 107). Correlational data support the claimed negative relationship between lack of trust and product innovation (Ekvall, 1996; Ekvall & Ryhammar, 1999). In a similar vein, distrust is seen as disruptive of a supporting and cooperative team climate and, therefore, creativity and innovation, as well (e.g., Amabile, Conti, Coon, & Lazenby, 1996; Amabile & Gryskiewicz, 1989; Hunter, Bedell, & Mumford, 2007). Experimental data from Klimoski and Karol (1976) are consistent with this reasoning: Groups consisting of participants low in mutual trust performed worse in a creative ideation task than either groups high in mutual trust or control groups.

Research on factors related to the concepts of trust and distrust further supports this view: For example, psychological safety, i.e., the expectation that others will respond favorably to expressing concerns or proposing new ideas, is assumed to be conducive to creativity in the workplace (cf., Hennessey & Amabile, 2010). Psychological safety is certainly incompatible with distrust and is, instead, rather associated with trust. Taken together, the reported evidence suggests a detrimental effect of suspicious spirits on creativity.

Nevertheless, it is especially in situations of potential danger that a problem must be solved on the spot, often in an unusual or novel way. Creativity as a means of problem solving might be especially important in such situations. Researchers have begun to take a closer look at the potentially beneficial influence of challenging or threatening states on creativity. Along the way, our understanding of the factors which hinder and foster creativity has become considerably more complex. For example, De Dreu and Nijstad (2008) suggested that conflict is conducive to creativity if creative performance is related to handling the conflict at hand: They found participants in a conflict mindset to be more creative in coming up with competitive negotiation tactics such as making threats, withholding concessions, or deception. Another example is a positive relationship between successful deception and creativity: Effective lying has been shown to be positively correlated with creativity in lying, as well as with one's performance on common measures of creative ideation (Walczyk, Runco, Tripp, & Smith, 2008). Taken together, these more recent findings suggest that challenging situations such as perceived conflict or the perceived necessity of lying can be associated with increased creativity.

Could this also be true for distrust? Quite certainly, distrust is unlikely to enhance creativity through its implications for social climate. Yet, as mentioned earlier, the *cognitive* consequences of distrust might have different implications for creativity, because they resemble “thinking outside the box.” In the following, I will elaborate on the meaning of “thinking outside the box” and the respective overlap of creative and suspicious cognition.

The Creative Mind of Suspicious Spirits

Thinking outside the box refers to thinking unconventionally and considering situations from novel perspectives. The term therefore constitutes a common metaphor of creative cognition, i.e., of cognitive processes that yield creative insights and original ideas as end products. The metaphor maps nicely onto *cognitive flexibility*, a process that has traditionally been regarded as conducive to creativity (Duncker, 1935/1963; Guilford, 1967; Runco, 2007). Not surprisingly then, cognitive flexibility is also a central component of the recently introduced *Dual Pathway to Creativity Model* (DPCM; De Dreu et al., 2008). The model identifies *cognitive persistence* as an alternative process of creative cognition. Both pathways—individually or combined—have the potential to yield novel, original outcomes. Using the flexibility pathway, novel ideas originate from changing perspectives (‘set-breaking’, e.g., Smith & Blankenship, 1991) and flat associative hierarchies (Mednick, 1962). This kind of creative cognition becomes manifest in the use of many different cognitive categories as well as in the breadth and inclusiveness of the categories themselves. Flat associative hierarchies further imply an increased accessibility of remote associations (Mednick, 1962). Using the persistence pathway, original ideas are discovered by systematically and perseveringly exploring relatively few cognitive categories, but doing so in depth.

This alternative process of creative cognition usually results in prolonged effort and increased time-on-task.

With these characteristics of creative cognition in mind, let's have a look at distrust and its cognitive consequences: Distrust is evoked by the threat of a possible deception. Still, walking away from every potentially suspicious character or disbelieving any potentially invalid information would not be a well-adapted option. We might miss out on opportunities, if the person were actually trustworthy or the information were true (Fetchenhauer & Dunning, 2009). A better strategy would be to invest in more elaborate information processing (Chiappe et al., 2004; Hilton, Fein, & Miller, 1993; Schul et al., 1996) and to prepare for both appearances being true and appearances not being true, thus considering rival interpretations of a counterpart's behavior or of given information. It seems that this is exactly what the cognitive system automatically turns to when receivers doubt the validity of a message: Information is processed as if it were true and as if it were not true at the same time. To prepare for the case in which appearances were indeed not what they seemed to be, distrust is likely to induce individuals to try to figure out what the truth or a potentially hidden motive might be. To do so, people in a state of distrust appear to consider possible alternative scenarios that may hold true in the event the given information is misleading (Chiappe et al., 2004; Fein, Hilton, & Miller, 1990; Marchand & Vonk, 2005; Schul, 1993; Schul et al., 1996). Moreover, being skilled deceivers themselves, people are aware that for deception to be successful it is crucial to make the true motive as non-obvious as possible. In the case of impending deception, people therefore know that they are well-advised to look for uncommon, non-routine occurrences.

Not only do these characteristics of information processing in a distrust mind seem quite face-valid, they are also supported by research on effects of distrust on cognition. These cognitive effects of distrust, in turn, relate to processes that have been shown to be *beneficial* to creative performance. In the following, I will describe important aspects of suspicious cognition and their relation to creativity.

Cognitive complexity. Earlier work by Garske (1975) concludes that “low trusters seem to possess relatively more adaptive, well-differentiated cognitive mode” (p. 619), supporting the notion that low trust—or distrust—might be of value in terms of cognitive performance. This conclusion derives from the finding that habitually “low trusters” exhibited higher levels of cognitive complexity than people with high levels of generalized interpersonal trust (Garske, 1975). Cognitive complexity refers to the number of perceptual categories available for encoding information and also to the number of rules available for combining this information (cf., Schroder, Driver, & Streufert, 1975)—characteristics that should benefit creative performance. And indeed, cognitive or integrative complexity is positively related to complex problem solving (Karlins, 1967; Karlins & Lamm, 1967), cognitive flexibility (Scott, 1962), and actual measures of creativity itself (e.g., Charlton & Bakan, 1988; Lennon & Davis, 1987; Quinn, 1980; Tetlock, Peterson, & Berry, 1993; Tuckman, 1966). Integrative complexity has even been considered a necessary prerequisite for creativity (Schroder et al., 1975).

Accessibility of opposite cognitions. If distrust fosters cognitive activity that prepares for both the validity and the invalidity of appearances, it should prompt the opposite of any given information to become readily available. Schul and colleagues (2004) investigated this possibility in a series of experiments and demonstrated that a

state of distrust does indeed involve a basic tendency to activate incongruent cognitions. In one study, for example, distrust cues facilitated reactions to target words (e.g., hollow) that were preceded by prime words opposite in meaning (e.g., full). Were the target word, in contrast, preceded by a prime word congruent in meaning (e.g., empty), the reaction to the target word was facilitated more by a trust than by a distrust cue. The researchers replicated the effect of heightened accessibility of opposite concepts using a free association task: People were more likely to produce an opposite associate for a prime word accompanied by a distrust cue vs. a trust cue. Opposite cognitions are not per se more creative (i.e., more unusual or more remote) than congruent ones, but sometimes rather represent the primary response to a stimulus word (e.g., Carroll, Kjeldergaard, & Carton, 1962). Furthermore, antonymous prime-target relations yield comparable response latencies and priming effects to synonymous ones (e.g., Perea & Rosa, 2002). Nonetheless, the frequency and the speed of responding to a prime word with an opposite in free word association has been linked to the creative personality (Rothenberg, 1973a, 1973b, 1983): Creative people respond more often with an opposite and do so more quickly than less creative people, regardless of the commonness or unusualness of the antonymous association. Rothenberg (1971) postulated that it is the so-called *Janusian Thinking*—i.e., the *simultaneous* consideration and utilization of opposite ideas—that is useful for producing something new and therefore conducive to creativity.

Thinking about alternatives. When in a distrust state of mind, people are not likely to stop at simultaneously considering any given information to be both true and untrue, but to proceed by thinking about possible alternative scenarios in the event that the given information is misleading (see e.g., Hilton et al., 1993). This notion is

consistent with research showing that people do not only elaborate more when suspicious (Chiappe et al., 2004; Hilton et al., 1993; Schul, 1993; Schul et al., 1996), but that they do so by entertaining multiple interpretations of the motives of a potentially deceitful person (Marchand & Vonk, 2005) or of potentially invalid information rather than elaborating intensely on that information within only one interpretative frame (Fein et al., 1990; Schul et al., 1996). The ability to think about multiple alternatives, in turn, is a central aspect of creative thinking and the basis for performing well in so-called divergent thinking tasks—tasks that are widely used for measuring creativity. A prototypical divergent thinking task clearly reflects the necessity of thinking about alternatives in its title “*alternative uses task*” (cf., Guilford, 1967).

Empirical support is provided—even though only indirectly—by research documenting the positive effects of the need to avoid cognitive closure on the generation of multiple alternative interpretations (Mayseless & Kruglanski, 1987). A high need to avoid cognitive closure is seen as particularly likely when validity concerns are salient (Kruglanski & Webster, 1996) and thus suspicious people can be assumed to exhibit a rather high need to avoid closure (cf., Fein, 1996). The need to avoid cognitive closure, in turn, is conducive to creative performance (Chirumbolo, Mannetti, Pierro, Areni, & Kruglanski, 2005). Additional evidence for the beneficial effect of thinking about alternatives for creative performance comes from research on counterfactual thinking (Markman et al., 2007; see also Kray, Galinsky, & Markman, 2009), the process of mentally creating alternative outcomes to a given event. A counterfactual mindset fosters creative idea generation when the counterfactuals are *additive* in nature, i.e., when the alternatives *add* something (e.g., an umbrella) to the

actual event (getting wet in the rain) in order to mentally change the outcome (“If only I owned an umbrella, I would not have gotten wet.”). The mind set evoked by *subtractive* counterfactuals, i.e., alternative scenarios that remove existing elements (e.g., the rain) from the actual event (e.g., “If only it hadn’t rained, I would not have gotten wet.”; examples by Markman et al., 2007, p. 313), in contrast, do not foster creative performance. The tendency to interpret information in multiple ways in a distrustful state of mind seems similar to additive counterfactuals insofar as the number of alternative scenarios is almost infinite compared to subtractive counterfactuals.

Sensitivity to non-routine strategies. Distrust is not only likely to make people think in alternatives, but to make them look for rather non-obvious alternative interpretations, more specifically. This seems adaptive, as a person trying to *successfully* deceive someone will attempt to make the truth as non-obvious as possible. In order to avoid falling prey to a deception attempt, being sensitive to non-routine occurrences makes good sense. Schul and colleagues (2008) conducted a set of studies to examine whether people in a state of distrust indeed exhibited a heightened sensitivity towards non-routine—and therefore less obvious—contingencies. To that end, they had participants perform tasks that required figuring out and employing an appropriate rule for successful completion. The appropriate rule was either a routinely engaged one or a less routinely used one. Overall, the performance of control participants confirmed the presupposed nature of the two rules: They performed better when successful completion depended on the routine rule. Yet, the opposite was true for participants who underwent a distrust manipulation beforehand: They performed better when successful completion required employing the non-routine rule. Not only does the association between a preferential use of non-routine strategies and creativity

seem self-evident, but “non-routine problem solving” can even be used as a synonym for “creative problem solving” (cf., Mayer, 1995) and, therefore, constitutes an integral part of creativity. The data by Schul and colleagues (2008) further hint quite directly at cognitive flexibility as a characteristic of distrust conducive to creativity: Participants in a state of distrust changed their strategy more readily when they realized that the initially-employed rule did not yield the desired outcome. The readiness to switch among rules constitutes a common measure of cognitive flexibility (Baumann & Kuhl, 2005; Dreisbach & Goschke, 2004).

As described above, the cognitive characteristics of distrust have clear implications for creative cognition. On a more specific level, the cognitive consequences of distrust map quite directly onto characteristics of cognitive functioning related to creativity. On a more general level, suspicious spirits are likely to consider information from multiple perspectives. These perspectives, in turn, tend to be rather remote, uncommon ones. Put differently, distrust seems to make people think outside the box. With regard to the framework provided by the DPCM (De Dreu et al., 2008), these cognitive characteristics of a distrust mindset seem to nicely overlap the flexibility pathway to creativity.

Social vs. Private Creativity

The cognitive consequences of distrust strongly suggest a beneficial effect of suspicious spirits on flexible minds and on creative performance more generally. Yet, this seems at odds with findings from a review of the research on the link between distrust and creativity, which indicates a detrimental effect of suspicious spirits on creativity. A closer look at the two contradicting lines of research reveals a possible

moderator: Most research hinting at detrimental effects of distrust on creativity refers to something one might term “public creativity”, i.e., creative tasks performed in group settings. For this kind of creativity, the *social* consequences of distrust seem most relevant: It is not only crucial to come up with creative ideas, but to *share* them, as well. Distrust, however, will keep people from sharing ideas—and probably the more unusual and possibly “crazy” ones in particular—in order to protect themselves against exploitation and ridicule (Amabile & Gryskiewicz, 1989; Edmondson, 2004; Ekvall, 1996; Ekvall & Ryhammar, 1999; Klimoski & Karol, 1976; Petermann, 1992; Rotenberg et al., 2010; Schoorman et al., 2007; West, 2002; see also De Cremer, 1999). Self-report data from the above-mentioned study on creativity in brainstorming groups by Klimoski and Karol (1976) support this reasoning: Low trust groups reported less “willingness to share embarrassing information” as well as less “freedom to express themselves” (p. 632) than both the high trust and the control groups. Additional support for this notion stems from negotiation research. Here, information sharing has been shown to decrease with lower levels of trust (Butler & Cantrell, 1994; De Dreu, Giebels, & Van de Vliet, 1998; Kimmel, Pruitt, Magenau, Konar-Goldband, & Carnevale, 1980).

To the contrary, findings of heightened creativity in a conflict mindset or related to effective lying are characterized by the relative privacy of the creative act: Competitive negotiation tactics are not disclosed to the other party for scrutiny (De Dreu & Nijstad, 2008; but see also Beersma & De Dreu, 2005) nor will a liar reveal his or her (creative) considerations in coming up with an effective lie. Social climate might therefore be less important to creativity in private, making room for the potentially beneficial cognitive consequences of a distrusting state of mind.

The Current Research

In accordance with the diverging social and cognitive consequences of distrust, I predict a detrimental influence of distrust on creative performance when the task involves public sharing of creative ideas. In cases where the task does not require sharing ideas, however, I hypothesize the opposite to be true, namely, increased creativity in a distrusting state of mind. The following four studies set out to investigate these influences of distrust on creativity. Study 1 aims at disentangling the differential influence of distrust on creativity depending on whether public information sharing is inherent to the creativity task or not. Studies 2 to 4 focus on the hypothesized beneficial influence of the cognitive consequences of distrust on creative cognition in private.

For these private situations, *focused* distrust—i.e., suspicion directed at a specific person in a particular situation—might not be the most relevant one. It is rather the more diffuse state of *unfocused* distrust that is likely to influence our creativity in private.

With the operationalizations of distrust used, I intend to (a) closely model the form of distrust relevant to private creativity, and to (b) instill distrust in a pure fashion (“mere state of distrust”; Schul et al., 2004, p. 669) that does not simultaneously involve additional social factors such as, for example, decreased liking of a specific target (cf., Rule et al., 2010; Tyler, Feldman, & Reichert, 2006). I, therefore, chose to manipulate distrust in a subtle way and to separate the distrust manipulation from the creativity task. This approach has been taken not only in previous research on distrust (Rotenberg et al., 2010; Schul et al., 2004, 2008), but also in research on other important interpersonal variables like social power (Galinsky et al., 2008). Specifically, Studies

1, 3, and 4 employ a subliminal priming procedure embedded in a lexical decision task. Study 2 employs a supraliminal priming procedure, namely a scrambled sentences task. Both procedures are widely used for concept activation in an unobtrusive manner (cf., Bargh & Chartrand, 2000).

As dependent measures, three tasks that tap different aspects of creative thinking are employed. In Studies 1 and 2, creativity is assessed by one of the most widely used creativity measures, namely, a prototypical idea generation task. More specifically, an alternative uses task (Guilford, 1967) was used. Tasks of that kind call for the generation of different possible solutions to a problem and allow for the investigation of different aspects of creative performance. Studies 3 and 4 take a closer look at the hypothesized increase in cognitive flexibility brought on by distrust. This is done by measuring category inclusiveness and flat associative hierarchies as two central manifestations of cognitive flexibility. To that end, in Study 3, the so-called category inclusion task (Rosch, 1975) was employed—a measure widely used to assess category inclusiveness in creativity research (e.g., Carnevale & Probst, 1998; De Dreu & Nijstad, 2008; Isen & Daubman, 1984). In Study 4 I investigate the idea that distrust involves flat associative hierarchies, which is reflected in an increased accessibility of remote associations (Mednick, 1962). To that end proximal compared to remote semantic spread is measured by means of an (in)direct priming procedure (Kiefer, Weisbrod, Kern, Maier, & Spitzer, 1998; Topolinski & Deutsch, 2009).

EMPIRICAL EVIDENCE

Study 1

Study 1 was designed to examine whether distrust and trust have differential effects on creativity depending on whether creative ideas will be made public or not. To that end, first a distrust mindset vs. a trust mindset was induced in participants via a subliminal priming procedure. Subsequently, they were asked to work on an idea generation task to measure creative performance. One group of participants believed their ideas would remain private, while another group of participants was told that their ideas were simultaneously made public to a participant next door. In accordance with prior research, I expected distrust to have a detrimental effect on creativity if creative performance required public sharing. I did, however, expect the beneficial cognitive consequences of distrust to take effect when creative performance remained private.

Idea generation tasks allow for the investigation of different aspects of creative performance. With regard to these different aspects, predictions must be specified. Idea generation tasks are typically scored for quantity (*ideational fluency*), quality (*originality*), and diversity of production (*flexibility*) (e.g., Plucker & Renzulli, 1999). Additionally, from the latter two measures an indicator of *persistence* can be calculated (cf., De Dreu et al., 2008; Nijstad, Stroebe, & Lodewijkx, 2002). Out of these indicators, originality certainly constitutes the core component of creativity. This seems self-evident from the common use of originality as a synonym for creativity in everyday language (“Creativity,” n.d.). The prominent role of originality further follows from the scientific definition of creativity as the generation of work that is novel/uncommon, i.e., original (e.g., Sternberg & Lubart, 1999). Therefore the

hypothesized differential influences of distrust compared to trust depending on public vs. private performance concerns first and foremost the originality of solutions. Quality of solutions (originality) may come along with quantity (e.g., Diehl & Stroebe, 1987; Hocevar, 1979; Osborn, 1963), but this need not be the case. A conceptually similar pattern for ideational fluency is therefore conceivable, but not central, to my hypothesis. The remaining measures of flexibility and persistence refer to the two alternative pathways to creativity proposed by De Dreu and colleagues (2008). My reasoning suggests that with regard to influences of distrust on creativity, the flexibility pathway is the critical one. Therefore, I expect the pattern for flexibility to be parallel to the one for originality. The investigation of the persistence measure is mainly exploratory in nature.

Method

Design and Participants

Study 1 is based on a 2 (type of priming: distrust vs. trust) × 2 (context of idea generation: public vs. private) between-subjects factorial design. Sixty-eight students were recruited as participants and randomly assigned to one of the four experimental conditions. Participants were approached on a campus of the University of Cologne and offered chocolate and coffee vouchers as compensation for participation in two short experimental tasks. Three participants were excluded due to data collection irregularities, leaving a final sample of 65 participants (44 female).

Materials and Procedure

When the experimenter and the participant arrived at the lab, they found a female confederate waiting in front of the locked lab door, pretending to be another participant. The experimenter thanked the confederate for waiting and told both participants that the session was ready to begin. Inside the lab, the experimenter ushered the participant and the confederate into two adjacent, sound insulated cubicles and asked them to sit down in front of a 75 Hz computer monitor. Along the way, the experimenter explained that instructions and tasks would be presented via computer and that participants should be able to work through the session on their own. After giving their consent, participants proceeded to the first task.

The first task served as a means to subliminally and repeatedly present participants with the German word for either the verb “to distrust” (*misstrauen*) or the verb “to trust” (*vertrauen*). These prime words were embedded in a lexical decision task (cf., Dijksterhuis, Aarts, Bargh, & van Knippenberg, 2000; Mussweiler & Förster, 2000) of 26 trials in total. Instructions pointed out that participants were to focus on the center of the screen where letter strings would appear. Their task was to decide whether or not any given letter string constituted a proper German word. Every trial began with the presentation of a fixation string (XWXXWWXXWX) for 3,000 ms. Ostensibly to help participants to stay focused, the fixation string “flashed” before the target string appeared. Unbeknownst to the participant, the flashing was produced by replacing the fixation string by the prime word (13 ms) and immediately masking the prime word by the fixation string again (506 ms) (cf., suggestions by Bargh & Chartrand, 2000). Next, the target letter string overwrote the fixation string and remained on the screen until the participant indicated her decision by pressing either a blue computer key (for proper

German words) or a yellow key (for non-words). The first two trials served as practice trials and instead of the prime word a blank screen was presented. The subsequent 24 experimental trials each contained the same prime word, i.e., the German word *misstrauen* (to distrust) in the distrust condition and the German word *vertrauen* (to trust) in the trust condition, respectively. The target letter strings were proper German words in one of the practice trials and 18 of the experimental trials (e.g., *Jacke* [jacket], *kämmen* [to comb]) and nonsense letter strings in the remaining seven trials (e.g., *grompem*, *Bealk*).

After completion of the subliminal priming task, participants continued on to a second, ostensibly unrelated, experiment. This study consisted of an idea generation task and constituted the dependent measure of creativity. In addition, instructions for the task served as a means to introduce the second experimental factor, i.e., the context of idea generation (public vs. private). All participants first read that the study was investigating factors which influenced creativity in brainstorming sessions. Participants were further told that the experiment was particularly concerned with how the simultaneous processing of ideas provided by other people—a characteristic of brainstorming in groups—influenced generating ideas oneself. The instructions further read that there were two different roles—creating ideas while processing ideas of others vs. creating ideas undisturbed. Actually, the computer assigned all participants the latter role, i.e., creating ideas undisturbed. Depending on condition, however, participants received different information as to what would happen to the ideas they were about to generate. In the public condition, instructions explained that the person in the adjacent cubicle (the confederate) was assigned the role “generating ideas while processing the ideas of others”. Participants were told that, to that end, every idea they

typed in would immediately be made public by being transferred to the computer in the adjacent cubicle and displayed on the screen, ostensibly for the other participant to process. In the private condition, instructions did not mention the other person but stated merely that the participant's ideas would be saved on a special server.

Next, participants received detailed instructions for the idea generation task, a so-called alternative uses task (Guilford, 1967), in which participants were told that they were to generate as many alternative uses for an everyday object as they could think of. With the help of an example, it was stressed that the generated uses should differ from the common use of the object as well as from each other. Before beginning idea generation, participants were asked to click on a button to check whether the person in the adjacent cubicle was ready to begin (public condition) vs. whether the connection to the server was working properly (private condition). This was done to lend credibility to the cover story. After a few seconds participants read that the person in the adjacent cubicle (vs. the server) had confirmed the connection. On the next screen, participants were presented with the object they should generate alternative uses for (a newspaper, cf., Wallach & Kogan, 1965) as well as an input field to type in their ideas.

A final questionnaire asked for some demographic data and tested for awareness of the true purpose of the study as well as for awareness of the prime word in the subliminal priming procedure. Specifically, participants were told that during the flashes a stimulus was presented to them and they were asked to list what they were able to detect. None of the participants indicated awareness, neither of the true purpose of the study nor of the prime word. At the end, participants were thanked and handed their compensation.

Measures and Dependent Variables

Indicators of creative performance were derived from ideas generated in two minutes (cf., Gilhooly, Fioratou, Anthony, & Wynn, 2007; Schoppe, 1975). According to the widely used scoring conventions of idea generation tasks (cf., Plucker & Renzulli, 1999), in a first step, ideas were coded for ideational fluency, originality, and flexibility. In a second step, a measure of persistence was calculated from the fluency measure and the flexibility measure.

The number of non-redundant ideas constituted the measure of *ideational fluency*. For the *originality* measure, two independent coders rated every idea on a 5-point scale, ranging from 1 (*not at all creative*) to 5 (*very creative*). Coders were instructed to consider the criteria uncommonness, remoteness, and cleverness of ideas in their scoring (adapted from Silvia et al., 2008; cf., Wilson, Guilford, & Christensen, 1953). Prior to coding, ideas were freed of all individualizing information (e.g., participant number, experimental condition), corrected for spelling errors, and sorted alphabetically. Thus, coders were blind to experimental condition as well as to the serial position and total number of ideas in any given set of ideas (cf., Silvia et al., 2008). The alphabetical sorting was done to have identical or similar ideas appear largely next to each other and thus facilitate the decision on the uncommonness criterion. Interrater reliability was good (intraclass correlation coefficient = .78). Ratings of the two coders were averaged per idea. The resulting values were used to compute a mean originality score for each participant by averaging these values for the participant's set of ideas.

Flexibility is reflected in the number of different semantic categories ideas are derived from. The more categories a participant uses, the higher her cognitive

flexibility. In order to create a category system, I reviewed ideas generated by a different group of 28 participants and extracted 14 categories (e.g., crafting, hygiene, weapon) complemented by a miscellaneous category for ideas that did not fit either of the semantic categories. The category system contained a brief description as well as a few examples for each category. Prior to coding, ideas—freed of individualizing information and corrected for spelling errors—were sorted randomly. Two independent coders assigned a category to each idea. Interrater reliability was excellent for single ideas (Cohen's $\kappa = .94$) and for the number of different categories per participant (intraclass correlation coefficient = .98). The flexibility index was calculated by averaging the numbers of different categories per participant that resulted from the ratings of the two independent coders. *Persistence* is characterized by an in-depth exploration of categories. Therefore, the more ideas an individual generates within any tackled category, the higher her persistence. Accordingly, a measure of average within-category fluency was derived for each participant by dividing the number of unique ideas (ideational fluency) by the number of categories these ideas were derived from (flexibility) (De Dreu et al., 2008; Nijstad et al., 2002).

Results

In the main analysis, the originality measure was submitted to a 2 (type of priming: distrust vs. trust) \times 2 (context of idea generation: public vs. private) analysis of variance (ANOVA). For exploratory purposes, analogous analyses were performed for the remaining three indicators. Means and standard deviations for all four measures are given in Table 1.

Main Analysis: Originality

I hypothesized that the way distrust vs. trust priming influences participants' originality scores critically depends upon the context of idea generation. Specifically, my reasoning holds that, relative to trust, distrust would reduce originality in the public context and increase it in the private context. Inspection of Table 1 reveals that the mean originality scores are indeed in line with this predicted pattern: In the public condition, participants primed with distrust achieved lower originality scores than participants primed with trust. Conversely, in the private condition, participants primed with distrust exhibited higher originality scores compared to participants primed with trust. This pattern was borne out in a significant interaction effect, $F(1, 61) = 5.89$, $p = .02$, $\eta^2_p = .09$ (all other F s < 1 , ns).

Table 1. Means and Standard Deviations (in Parentheses) of Mean Originality of Ideas, Number of Ideas (Fluency), Number of Categories (Flexibility), and Within-Category Fluency (Persistence) as a Function of Type of Priming (Distrust vs. Trust) and Context of Idea Generation Condition (Public vs. Private) in Study 1.

| Measures | Context of idea generation | | | |
|-------------|----------------------------|---------------|---------------|---------------|
| | Public | | Private | |
| | Distrust | Trust | Distrust | Trust |
| | <i>M (SD)</i> | <i>M (SD)</i> | <i>M (SD)</i> | <i>M (SD)</i> |
| Originality | 1.41 (0.44) | 1.68 (0.40) | 1.58 (0.29) | 1.43 (0.22) |
| Fluency | 6.12 (2.23) | 7.13 (2.03) | 8.07 (3.06) | 7.41 (1.91) |
| Flexibility | 4.50 (1.27) | 5.63 (1.63) | 5.27 (1.40) | 4.94 (1.29) |
| Persistence | 1.37 (0.37) | 1.28 (0.18) | 1.52 (0.38) | 1.53 (0.35) |

Supplementary Analyses: Ideational Fluency, Flexibility, and Persistence

My hypotheses for *ideational fluency* were less strong than those for originality. Based on previous research demonstrating that effects on originality are sometimes accompanied by directionally similar effects in fluency, I reasoned that this could potentially also be the case in this study. Indeed, the pattern of means obtained is consistent with this possibility: In the public condition, participants primed with distrust tended to achieve lower fluency scores than participants primed with trust, whereas the opposite tendency resulted from the private condition. The respective two-way interaction did not reach significance, $F(1, 61) = 2.07, p = .16$. A trend toward a main effect for context of idea generation emerged, $F(1, 61) = 3.74, p = .06, \eta^2_p = .06$: Independent of type of priming, participants in the private condition (combined $M = 7.72, SD = 2.49$) tended to produce more ideas than participants in the public condition (combined $M = 6.61, SD = 2.16$). No main effect for type of priming emerged, $F < 1, ns$.

For *flexibility*, I expected a pattern similar to the one for originality. This follows from my reasoning that the flexibility pathway may be the critical one for the influence of distrust on creativity. An inspection of the means reveals a pattern consistent with this possibility: In the public condition, participants primed with distrust derived their ideas from fewer different categories than participants primed with trust. Conversely, in the private condition, participants primed with distrust exhibited higher flexibility scores compared to participants primed with trust. As for originality, this pattern resulted in a significant interaction effect, $F(1, 61) = 4.35, p = .04, \eta^2_p = .07$ (all other $F_s < 1.33, p_s > .25$). For the *persistence* measure, I did not make specific predictions, but because persistence is seen as an alternative pathway to creativity (De

Dreu et al., 2008) I decided to analyze the persistence data. Inspection of the means suggests a pattern different from those observed in the other indicators. In both the public condition and the private condition, persistence was similar for participants primed with distrust and for participants primed with trust. Independent of type of priming condition, persistence values were higher for participants in the private condition (combined $M = 1.53$, $SD = 0.36$) than for participants in the public condition (combined $M = 1.33$, $SD = 0.29$). This pattern of means corresponded to a significant main effect for context of idea generation condition, $F(1, 61) = 6.09$, $p = .02$, $\eta^2_p = .09$. No other significant effects emerged, all F s < 1 .

Discussion

Results of Study 1 are in line with my hypotheses. Effects of distrust vs. trust on originality crucially depended on whether creative behavior was carried out publicly vs. privately. In the public condition, I demonstrate that a distrustful climate is detrimental to creativity: Participants who had been told that their ideas were made public to another person produced less original ideas when in a distrust mindset compared to when in a trust mindset. This was not the case, however, for participants in the private condition whose ideas were ostensibly merely saved to a special server and, thus, remained private. Rather, in this condition there was a reversal in the pattern of means. I interpret the latter finding in concordance with the implications of research on the cognitive consequences of distrust suggesting a beneficial influence on creativity.

With regard to the supplementary analyses using additional indicators, a conceptually similar pattern for ideational fluency emerged. This is in line with

previous research showing that effects on originality and ideational fluency sometimes converge (e.g., Diehl & Stroebe, 1987; Rietzschel, Nijstad, & Stroebe, 2007). Furthermore, the fluency data show a tendency for lower productivity in the public than in the private setting. This is well in line with findings on the hindering influence of evaluation apprehension on ideational fluency (e.g., Diehl & Stroebe, 1987). As public performance often is accompanied by some form of evaluation, the manipulation in the public condition is likely to have yielded at least a mild degree of evaluation apprehension.

With regard to category diversity as the indicator of flexibility, again, a pattern parallel to the one found in originality emerged: In the public condition, distrust yielded less category diversity than trust; in the private condition, the pattern was reversed. Results from the persistence measure indicate no differences for participants primed with distrust and participants primed with trust regardless of publicity. Taken together, findings from these two measures are consistent with the proposition that cognitive flexibility may be critical for influences of distrust on creativity.

In sum, the results provide initial support for my hypothesis that—under specific conditions—distrust may enhance creativity. I now focus on these specific conditions, namely situations that do not involve public sharing. The remaining studies were therefore designed to shed further light on the creativity enhancing potential of distrust.

Study 2

As a first step in this endeavor, Study 2 was designed to examine the effects of distrust under conditions of true privacy. Although Study 1 established conditions of privacy, for reasons of experimental control, the private condition used in Study 1 had

to be modeled closely after the public condition. More specifically, participants in the private condition were informed that their ideas would be saved on a server. This operationalization certainly involves a higher level of privacy in the private condition than in the public condition where ideas were transferred to another person. Nevertheless, participants in the private condition may well have assumed that their ideas would be analyzed by the experimenter at some later point in time. In this respect, the private condition may have established only a moderate level of privacy. To examine the effects of true privacy, in Study 2, participants were not made believe that their ideas would be transferred to a server. As a consequence, participants are likely to experience a heightened sense of privacy so that the creativity-enhancing effects of distrust may become more readily apparent.

To assess how distrust influences creativity, I used the same creativity measure—an idea generation task—as in Study 1. For the purpose of generalizability, however, a different priming manipulation was employed. More specifically, I adapted another widely used priming procedure, namely a scrambled sentences task (Srull & Wyer, 1979), to induce distrust vs. trust. Furthermore, a neutral control group was added. So far, trust manipulations have repeatedly yielded similar results to the control conditions in experimental studies (Klimoski & Karol, 1976; Schul et al., 2004; cf., Schul et al., 2008), most likely because trust constitutes a default state. Without reasons for doubt, we typically have trust in others (e.g., Berg et al., 1995; McKnight et al., 1998; cf., Gilbert, 1991). In light of this default to trust, I expected similar levels of creativity in both the trust and control conditions. In line with the results of Study 1, however, my theoretical analysis holds that—compared to the trust and control

conditions—distrust enhances creativity. As in Study 1, originality again constitutes the central measure of creativity.

Method

Design and Participants

Sixty psychology students were recruited as participants and offered partial course credit as compensation. They were randomly assigned to either a distrust condition, a trust condition, or a control condition. Three participants were excluded due to data collection irregularities, leaving a final sample of 57 participants (39 females).

Materials and Procedure

Participants were run in groups of up to three. Upon arrival in the lab, each participant was led to a separate booth, and asked to sit down at a desk equipped with a computer. The experimenter explained that instructions and tasks were presented via computer and that participants should be able to work through the session on their own. Participants were told that they would be given two short experimental tasks.

The first of these was the scrambled sentences priming task (Srull & Wyer, 1979) which was introduced as a study on intuitive language processing. Instructions to this task pointed out that, in each trial, five words would be presented in random order. Four out of the five words formed a meaningful sentence. Participants were asked to quickly figure out which of the five words to drop, to form the sentence with the remaining four words, and to type it into the computer. Seven out of a total of 15 trials were identical for all three conditions. These trials did not contain prime words and

were chosen to be unrelated to distrust and trust. In the control condition, the same was true for the remaining eight trials. In the distrust and the trust condition, these remaining trials contained prime words closely related to distrust and trust, respectively. Examples for prime words in the distrust condition are *Argwohn* (suspicion), *zweifeln* (to doubt), and *fraglich* (questionable). Examples for prime words in the trust condition are *Verlass* (dependence), *glaubwürdig* (credible), and *zuverlässig* (reliable). Trials were presented in random order.

The second, ostensibly unrelated, task was the alternative uses task, the creativity measure. Instructions were mostly similar to the ones described in Study 1 with the exception that this time no mention was made that participants' ideas were transferred to a server or another person.

A final questionnaire asked participants to provide some demographic data. A concluding question probed for suspicion of the true purpose of the study. None of the participants indicated awareness. At the end, participants were thanked and given their course credit as compensation.

Measures and Dependent Variables

Measures of ideational fluency, originality, flexibility, and persistence were derived as described in Study 1. Interrater reliabilities were comparable to the ones in Study 1 for the originality ratings (intraclass correlation coefficient = .74) as well as for the flexibility coding (Cohen's κ = .91 for single ideas; intraclass correlation coefficient = .98 for the number of different categories per participant).

Results

My hypothesis specifically predicts differing scores for the distrust condition compared to the other two conditions. Therefore, I used the corresponding contrast to analyze the originality scores as the main dependent variable as well as the other indices. Means and standard deviations for all four measures are given in Table 2.

Main Analysis: Originality

I hypothesized that relative to trust and control conditions, distrust would yield enhanced originality scores. In line with my reasoning, participants in the distrust condition achieved the highest originality scores out of the three priming conditions. The respective contrast comparing the distrust condition ($M = 1.48$, $SD = 0.32$) to the other two conditions (combined $M = 1.32$, $SD = 0.21$) was statistically reliable, $t(54) = 2.21$, $p = .03$, Cohen's $d = 0.66$.

Table 2. Means and Standard Deviations (in Parentheses) of Mean Originality of Ideas, Number of Ideas (Fluency), Number of Categories (Flexibility), and Within-Category Fluency (Persistence) as a Function of Type of Priming in Study 2.

| Measures | Type of priming | | |
|-------------|-----------------|---------------|---------------|
| | Distrust | Control | Trust |
| | <i>M (SD)</i> | <i>M (SD)</i> | <i>M (SD)</i> |
| Originality | 1.48 (0.32) | 1.36 (0.24) | 1.29 (0.18) |
| Fluency | 8.81 (2.66) | 6.76 (1.79) | 6.65 (2.13) |
| Flexibility | 6.06 (1.60) | 4.79 (1.10) | 5.05 (1.65) |
| Persistence | 1.49 (0.38) | 1.43 (0.31) | 1.37 (0.33) |

Supplementary Analyses: Ideational Fluency, Flexibility, and Persistence

For *ideational fluency*, my predictions were less strong but conceptually parallel to the ones for originality based on prior findings of at times converging results for both measures. In line with this reasoning, a pattern similar to the one observed in the originality measure emerged. Out of the three priming conditions, participants primed with distrust produced the highest number of ideas. The respective contrast comparing the distrust condition ($M = 8.81$, $SD = 2.66$) to the other two conditions (combined $M = 6.71$, $SD = 1.94$) was statistically reliable, $t(54) = 3.28$, $p = .002$, Cohen's $d = 0.99$.

In line with the notion that cognitive flexibility may be critical for the influence of distrust on creativity, I expected the findings for flexibility to parallel those for originality. The pattern of means obtained is consistent with this possibility: Participants primed with distrust derived their ideas from more categories ($M = 6.06$, $SD = 1.60$) than both participants in the trust condition and participants in the control condition (combined $M = 4.91$, $SD = 1.39$). The respective planned contrast was statistically reliable, $t(54) = 2.66$, $p = .01$, Cohen's $d = 0.81$. For the *persistence* measure, the analysis was again mostly exploratory. On a descriptive level, inspection of the means reveals a pattern similar to the other measures, i.e., highest persistence scores in the distrust condition. Yet, the contrast comparing the distrust condition to the other two conditions was not significant ($|t| < 1$).

Discussion

Study 2 was set up to investigate the influence of distrust on creative performance in a mostly non-public situation. As expected, distrust yielded increased creativity under these circumstances. This was true not only for originality as the main

variable of interest, but also for ideational fluency and flexibility. No reliable differences emerged for the persistence measure. Thus, Study 2 replicates the patterns found for the private condition in Study 1. In addition, Study 2 extends the findings of Study 1 in two important aspects: First, by employing a scrambled sentences task, I show that effects of distrust on creativity are not limited to a specific, i.e., a subliminal, priming procedure. Second, by adding a neutral control group, I was able to confirm an actual *increase* in originality, ideational fluency, and flexibility due to distrust.

Study 2 offers additional support for the notion that distrust enhances creativity under conditions of privacy. In addition, the findings from Study 2—together with the findings in the private condition of Study 1—suggest the cognitive mechanism that may be responsible for this effect. More specifically, these findings indicate that distrust induces cognitive flexibility and thus sets participants' minds on one of the main pathways to creativity. According to the Dual Pathway to Creativity Model (De Dreu et al., 2008), manifestations of the flexibility pathway include (a) the use of many different categories, (b) breadth and inclusiveness of the categories themselves, and (c) flat associative hierarchies. In my data so far, participants in the distrust condition derived their ideas from a larger number of different categories, thus exhibiting traces of one of the three aspects of the flexibility pathway.

Yet, flexibility indices in idea generation tasks are disputable because of their possible “contamination” by fluency (e.g., Hocevar, 1979; Plucker & Renzulli, 1999). The reasoning behind this seems quite straightforward: The more ideas an individual produces, the more likely she not only runs out of trivial responses (‘quantity breeds quality’, e.g., Diehl & Stroebe, 1987; Osborn, 1963), but also the more likely she has to change to a different category in order to find further non-redundant solutions. In line

with this reasoning, in both studies presented so far, the pattern in the fluency measure paralleled the one in the flexibility measure. In both cases substantial correlations between these two measures emerged, $r(65) = .73, p < .001$ (Study 1), and $r(57) = .67, p < .001$ (Study 2). Yet, as described before, cognitive flexibility is also thought of “as a precursor of the production of many (ideational fluency) and original responses” (De Dreu et al., 2008, p. 740). Following this reasoning, enhanced fluency could be “contaminated” by the increased accessibility of many different categories rather than vice versa. With this controversy in mind, the data presented so far do not unequivocally demonstrate that distrust does indeed come along with an increase in cognitive flexibility.

Therefore, in the following two studies, I aim at exploring more directly the underlying cognitive mechanisms of the creativity-enhancing effect of distrust demonstrated above. To that end, Studies 3 and 4 employ measures used to investigate the other two facets of the flexibility pathway—inclusiveness of categories and flat associative hierarchies—in a more direct manner.

Study 3

The cognitive consequences of distrust—thinking in multiple, rival alternatives—suggest enhanced cognitive flexibility as contributing to creative performance. Therefore, it seems especially worthwhile to find a different indicator to corroborate my preliminary findings on cognitive flexibility. I chose to employ the category inclusion task (Isen & Daubman, 1984; Rosch, 1975)—a task that has been widely used in creativity research (e.g., Carnevale & Probst, 1998; De Dreu & Nijstad, 2008; Friedman & Förster, 2000; Rietzschel, De Dreu, & Nijstad, 2007). This measure

captures cognitive flexibility through breadth and inclusiveness of categories. Broad and inclusive categories, in turn, are seen as conducive to producing original ideas (Murray, Sujan, Hirt, & Sujan, 1990).

The category inclusion task asks participants to rate the goodness of fit of several exemplars (e.g., car, wheelchair, camel) to a superordinate category (e.g., vehicle). Seeing highly and moderately typical exemplars (e.g., car, wheelchair) as good representatives of their category is not presumed to require cognitive flexibility (Isen & Daubman, 1984). They clearly belong to the category. The extent to which atypical exemplars (e.g., camel) are included into the category, however, requires looking at them in a different way than usual, and therefore presupposes cognitive flexibility. Following this logic, cognitive flexibility is captured by goodness of fit ratings for atypical exemplars.

To manipulate (dis)trust, I used the subliminal priming procedure employed in Study 1 and added a neutral control condition. I expect participants primed with distrust to give higher typicality ratings to atypical exemplars than participants in the trust and control conditions.

Method

Design and Participants

Study 3 is based on a 3 (type of priming: distrust vs. control vs. trust) \times 2 (typicality: high vs. low) mixed model design, with the last factor being manipulated within participants. Fifty-six students (40 females) were recruited as participants and randomly assigned to one of the three priming conditions. Participants were

approached at a campus of the University of Cologne and offered a chocolate bar as compensation for participation in two short experimental tasks.

Materials and Procedure

Upon arrival in the lab, participants were led to separate cubicles and asked to sit down in front of a 60 Hz computer monitor. The experimenter explained that all instructions and tasks were presented via computer and that participants should be able to work through the session on their own. After giving their consent, participants read that the study was about categorization and that they would work on two different categorization tasks consecutively.

The first task was labeled as a task requiring categorization of whether or not a letter string was a proper German word. The task consisted of the subliminal priming procedure described in Study 1,² complemented by a control condition. In the control condition, the fixation string (XWXXWWXXWX) was substituted for the priming word.

After finishing the priming task, participants proceeded to the category inclusion task (adapted from Friedman & Förster, 2000; cf., Isen & Daubman, 1984; Rosch, 1975). In this task, four category names (*Fortbewegungsmittel* [vehicle], *Möbel* [furniture], *Gemüse* [vegetable], *Kleidung* [clothing]) were presented followed by 12 exemplars of each. Categories were presented in random order. The 12 exemplars within each category were presented one at a time in a fixed order and differed in typicality from high (e.g., car for “vehicle”) through moderate (wheelchair) to low

² Due to the different monitor refresh rate, prime word presentation was 16 ms. Presentation time was, therefore, slightly longer than in Study 1.

(camel). Participants indicated for each exemplar how typical it was for the named category on a 10-point scale ranging from 0 (*atypical*) to 9 (*typical*).

A final questionnaire asked for some demographic data and tested for awareness of the true purpose of the study as well as for awareness of the prime word in the subliminal priming procedure. As in Study 1, participants were informed that a stimulus was embedded in the flashes presented to them, and they were asked to write down what they were able to detect. None of the participants indicated awareness, neither of the true purpose of the study nor of the prime word. At the end, participants were thanked and handed their compensation.

Measures and Dependent Variables

Typicality ratings in the category inclusion task constituted the critical dependent measure. In a first step, the typicality of each exemplar was defined with the help of the data provided by participants in the control group. To that end, for each category, the overall category mean was calculated. Each exemplar was then subjected to a *t*-test probing for deviation from its respective category mean. Exemplars that either significantly exceeded their category mean (strong exemplars) or did not significantly differ from their category mean (moderate exemplars) were averaged across the four categories and formed the high typicality index (Cronbach's $\alpha = .90$). Exemplars with means significantly lower than their respective category mean were categorized as weak exemplars and averaged across the four categories to form the low typicality index (Cronbach's $\alpha = .80$).

Results and Discussion

I hypothesized that distrust induces cognitive flexibility represented by increased category inclusiveness. As described earlier, category inclusiveness is reflected in higher ratings for the weak exemplars with ratings for the strong and moderate exemplars not being affected (Isen et al., 1987; Rosch, 1975). I therefore expected (a) participants in the distrust condition to rate the weak exemplars as more typical than participants in the other two conditions, and (b) ratings for the remaining exemplars (high typicality index) not to differ for the distrust condition compared to the other two conditions. To test these predictions, the typicality ratings were subjected to a 3 (type of priming: distrust vs. control vs. trust) \times 2 (typicality: high vs. low) repeated measures analysis of variance (ANOVA) with typicality as a within-subjects factor. In order to test the specific hypothesis that participants primed with distrust showed increased category inclusiveness—i.e., higher typicality ratings for the weak exemplars compared to the other two conditions—I calculated the respective planned contrast, as well.

Inspection of the means in Figure 1 reveals a pattern in line with my hypotheses: For exemplars low in typicality, participants primed with distrust exhibited the highest ratings ($M = 3.35$, $SD = 1.41$) and participants in the control group exhibited the lowest ratings ($M = 2.27$, $SD = 1.16$). Participants primed with trust provided ratings ($M = 2.80$, $SD = 1.07$) between those of the other two conditions. Ratings for high typicality exemplars are similar for participants primed with distrust ($M = 7.57$, $SD = 1.11$), participants in the control group ($M = 7.37$, $SD = 1.12$), and participants primed with trust ($M = 7.71$, $SD = 0.79$). This pattern of means corresponded to a significant interaction effect, $F(2, 53) = 3.36$, $p = .04$, $\eta^2_p = .11$, indicating that high and

low typicality indices were differentially affected by the priming conditions. A planned contrast confirmed that ratings for low typicality exemplars in the distrust condition ($M = 3.35$, $SD = 1.41$) were indeed higher than those in the other two conditions (combined $M = 2.56$, $SD = 1.13$), $t(53) = 2.37$, $p = .02$, Cohen's $d = 0.66$. Calculating the same contrast for the high typicality index did not reveal a significant difference, $|t| < 1$.

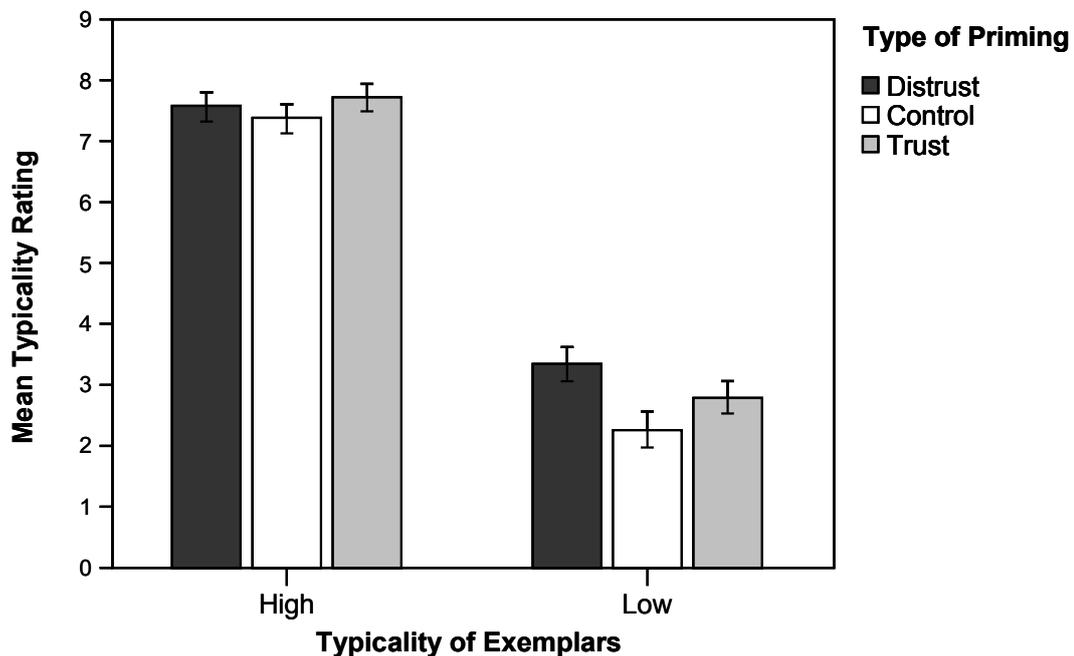


Figure 1. Mean typicality ratings as a function of type of priming condition (between-factor) and typicality of exemplars (within-factor) in Study 3. Error bars represent one standard error.

Confirming the nature of the typicality indices, a significant main effect emerged for typicality, $F(1, 53) = 1065.67$, $p < .001$: Independent of type of priming, participants rated high typicality exemplars (combined $M = 7.56$, $SD = 1.00$) as more typical than low typicality exemplars (combined $M = 2.83$, $SD = 1.27$). The main effect for type of priming was not significant, $F(2, 53) = 1.98$, $p = .15$.

In accordance with prior interpretations of the category inclusion task, these results support my hypothesis of increased cognitive flexibility under distrust. One

may, however, still argue that increased category inclusiveness of exemplars low in typicality does not necessarily reflect increased cognitive flexibility but rather increased persistence (De Dreu et al., 2008). By persevering and systematically working through possibilities, participants may end up concluding that weak exemplars do not fit the category so badly after all. If perseverance and careful systematic processing were responsible for increased category inclusiveness, this should be accompanied by increased response latencies, at least for exemplars low in typicality (cf., De Dreu et al., 2008). To test for this possibility, reaction times were averaged for exemplars high in typicality and for exemplars low in typicality, respectively. Reaction times were subjected to the same ANOVA as the typicality ratings. This analysis revealed only a significant main effect for typicality, $F(1, 53) = 14.09$, $p < .001$, indicating that, independent of type of priming, participants took longer to rate exemplars low in typicality than they took to rate exemplars high in typicality (all other F s < 1.27 , all other p s $> .29$). Inspection of the means further revealed that, descriptively, mean response latencies in the distrust condition were lowest among the three priming conditions for both high typicality exemplars and low typicality exemplars. Therefore, it seems unlikely that persistence was responsible for increased category inclusion in the distrust condition.

In conclusion, I consider the results of Study 3 as evidence for increased category inclusiveness and therefore as evidence for increased cognitive flexibility in a distrust mindset. Study 4 was designed to provide further experimental support for this contention by looking at another element of cognitive flexibility, namely flat associative hierarchies.

Study 4

Flat associative hierarchies are considered another manifestation of the flexibility pathway to creativity (De Dreu et al., 2008). Mednick (1962) first termed the phrases “flat associative hierarchies” and “steep associative hierarchies” to describe different patterns with regard to the associative strength of close and remote associations. In the case of steep associative hierarchies, close associates (e.g., chair) to a given stimulus (e.g., table) come to mind much more easily than relatively remote ones (e.g., leg or food; example by Mednick, 1962, p. 223). Put differently, there is a steep decline in associative strength from close to remote associates. In the case of flat associative hierarchies, close and remote associates are markedly more similar in their associative strength to the stimulus. If associative hierarchies are flat rather than steep, remote associations should, therefore, come to mind more easily. The accessibility of remote associations in response to a stimulus (e.g., newspaper), in turn, is likely to contribute to the emergence of original responses (i.e., *unusual* uses of a newspaper). After all, original ideas tend to be remote rather than trivial.

In line with this possibility, the accessibility of remote associations has been considered a measure of creativity itself, mostly assessed by means of the Remote Associates Test (RAT, Mednick, 1962). Items of this test consist of three stimulus words (e.g., rabbit ~ cloud ~ cream) sharing a remote associate (here: white). The shared remote associate constitutes the solution; the number of correctly solved items serves as the measure of creativity. The RAT has been widely used in creativity research (e.g., Isen et al., 1987; Maddux & Galinsky, 2009; Markman et al., 2007; Mednick, 1962; Slepian, Weisbuch, Rutchick, Newman, & Ambady, 2010; Voss, 1977). Yet, doubts have been raised with regard to the processes mediating

performance in the RAT (Harkins, 2006; see also Topolinski & Deutsch, 2009; Topolinski & Strack, 2008). More specifically, performance in the RAT seems susceptible to differences in task motivation in a quite unexpected way (Harkins, 2006): Highly motivated individuals are less likely to perform well, especially regarding difficult items, i.e., items with particularly remote solutions. This seems due to deliberately employing a rule—probing close associates to stimulus words as solutions—which yields inhibition of the remote associates.

The significant results on the fluency measure in Study 2 might be interpreted as increased task motivation in participants primed with distrust. Therefore, even if distrust actually yielded increased accessibility of remote associates, RAT performance might still be disrupted. To circumvent this potential problem, I chose to employ a different task measuring semantic spread more directly. More specifically, I used material from an (in)direct priming procedure developed by Kiefer and colleagues (1998). In this task, participants react to target words that are preceded by a prime word. The semantic association of the prime-target pairs varies from proximal to remote to unrelated. Typically, i.e., under neutral conditions, individuals show faster reactions in proximal trials than in remote trials (e.g., Kiefer et al., 1998), a pattern consistent with steep associative hierarchies. Increased remote semantic spread is reflected in relatively faster reactions to remotely associated prime-target pairs. If reactions to proximally related trials are not affected, this would further imply a diminished discrepancy in response latencies to proximally and remotely related trials. The latter is conceptually consistent with flat associative hierarchies, and, in turn, with increased cognitive flexibility.

As argued before, I hypothesized that distrust comes along with increased cognitive flexibility. Therefore, I expect participants primed with distrust to exhibit a pattern consistent with flat associative hierarchies, i.e., a pattern of increased remote semantic spread. As the results of both Studies 2 and 3 were largely in line with the notion that trust and control conditions produce similar results, I chose to contrast results for the distrust condition with a trust condition only. Consistent with the notion of trust as the default (cf., Berg et al., 1995; McKnight et al., 1998), I expect to find the typical pattern of prolonged response latencies in remote trials in the trust conditions. For reasons of compatibility with the (in)direct priming procedure, a slightly modified version of the subliminal (dis)trust priming (cf., Studies 1 and 3) was used.

Method

Design and Participants

Study 4 is based on a 2 (type of priming: distrust vs. trust) \times 2 (semantic distance: proximal vs. remote) mixed design, with the last factor manipulated within participants. Forty-eight individuals on the University of Cologne campus were recruited as participants and randomly assigned to one of the two priming conditions. Participants were offered 5 € (approx. \$ 6.50 at the time) as compensation for participation in an experimental session. One participant was excluded due to data collection irregularities, leaving a final sample of 47 participants (36 females).

Materials and Procedure

Upon arrival in the lab, participants were led to separate cubicles and asked to sit down in front of an 85 Hz computer monitor. The experimenter explained that the

experimental session was computer-administered and that participants should be able to work through the entire session on their own. After giving their consent, participants worked on a lexical decision task. This task combined the subliminal priming procedure with an (in)direct priming paradigm. The subliminally presented (dis)trust primes were again embedded in the flashing of the fixation string. The material for the (in)direct priming paradigm (Kiefer et al., 1998) consisted of a total of 270 word pairs. Each pair consisted of a prime word and a target letter string. Primes were all proper German words and so were half of the target letter strings. The remaining target letter strings constituted meaningless yet pronounceable non-words. Pairs with proper German words as targets differed with respect to the semantic relatedness of prime and target: Proximal (e.g., *König* ~ *Krone* [king ~ crown]), remote (e.g., *Bier* ~ *Traube* [beer ~ grape]), and unrelated (e.g., *Bleistift* ~ *Uhr* [pencil ~ clock]), with each category being represented by 45 pairs.

Participants worked through 132 trials drawn randomly from the pool of 270 prime-target pairs. This procedure yields, on average, 22 trials per category of semantic distance (proximal, remote, unrelated). Each trial began with the presentation of a fixation string (XQFBZRMQWGBX). After 494 ms the fixation string was briefly (12 ms, subliminal) replaced, by either the word *misstrauen* (distrust condition) or the word *vertrauen* (trust condition). Then the same fixation string was presented again for another 494 ms. Next, the prime word was presented for 153 ms (supraliminal). This prime word was replaced by a blank screen (94 ms) that was, in turn, followed by the target letter string. The target remained on the screen until participants indicated whether or not it constituted a proper German word by pressing the appropriate key (for procedures see Kiefer et al., 1998; Topolinski & Deutsch, 2009).

A final questionnaire asked for some demographic data and tested for awareness of the true purpose of the study as well as for awareness of the prime word in the subliminal priming procedure. As in Studies 1 and 3, participants were told that a stimulus had been presented to them during the flashes, and they were asked to write down what they were able to detect. None of the participants indicated awareness, neither of the true purpose of the study nor of the prime word. At the end, participants were thanked and handed their compensation.

Measures and Dependent Variables

For my purposes, only trials with real German words as targets were of interest (cf., Kiefer et al., 1998; Topolinski & Deutsch, 2009). From these trials, in a first step, incorrect responses (1.82 % of the data) and response latencies exceeding 2,000 ms (0.46 % of the data) were dropped. Additionally, response latencies longer than twice the individual mean per trial category (proximal, remote, unrelated) were not considered (1.01 % of the data; cf., Kiefer et al., 1998). The remaining response latencies were averaged per trial category.

Results and Discussion

Responses to proximally and remotely associated prime-target pairs constitute the main variable of interest, responses to unrelated prime-target pairs served as a baseline. For baseline trials, mean response latencies in the distrust condition ($M = 638$ ms, $SD = 141$ ms) and in the trust condition ($M = 657$ ms, $SD = 153$ ms) did not differ significantly, neither did the error rates, all $F_s < 1$.

In the main analysis, I focused on responses to proximally and remotely related prime-target pairs. As described previously, reactions to proximally related prime-target pairs are typically faster than reactions to remotely related ones (e.g., Kiefer et al., 1998). I expected reactions of participants primed with trust to correspond to this pattern. Yet, for reactions of participants primed with distrust, I expected a pattern consistent with *increased* remote semantic spread. More specifically, distrust participants should react comparatively faster in remote trials. Consequently, the typically found discrepancy between reactions to proximal and remote trials should become less pronounced or even nonexistent. To test these predictions, mean response latencies were subjected to a 2 (type of priming: distrust vs. trust) \times 2 (semantic distance: proximal vs. remote) repeated measures analysis of variance (ANOVA) with semantic distance as a within-subjects factor.

Inspection of the means in Figure 2 reveals a pattern of means consistent with my predictions: In the trust condition, the typical pattern of prolonged response latencies for remotely related trials ($M = 610$ ms, $SD = 131$ ms) compared to proximally related trials ($M = 574$ ms, $SD = 118$ ms) emerged. Further, participants primed with distrust reacted as fast to proximally related trials ($M = 574$ ms, $SD = 126$ ms) as did participants in the trust condition. In line with my predictions, participants primed with distrust, however, did *not* show the typical pattern of prolonged response latencies in remotely related trials. Rather, they were as fast in reacting to remotely related prime-target pairs ($M = 570$ ms, $SD = 92$ ms) as to proximally related ones ($M = 574$ ms, $SD = 118$ ms). This pattern of means was borne out in a statistically reliable two-way interaction, $F(1, 45) = 5.71, p = .02, \eta^2_p = .11$. In addition, a trend for a main effect for semantic distance emerged, $F(1, 45) = 3.53, p = .07, \eta^2_p = .07$. The main effect for type

of priming was not significant, $F < 1$. Subjecting the corresponding error rates to the same ANOVA did not yield any significant effects (all F s < 2.3 , all p s $> .13$).

These results shed additional light on the cognitive mechanisms that underlie the creativity-enhancing effect of distrust: Distrust-primed individuals exhibited increased remote semantic spread and thereby an activation pattern in accordance with flat associative hierarchies. Flat associative hierarchies, in turn, are considered a manifestation of the flexibility pathway to creativity (De Dreu et al., 2008). I, therefore, interpret this finding as yet another indicator of increased cognitive flexibility in a distrust mindset.

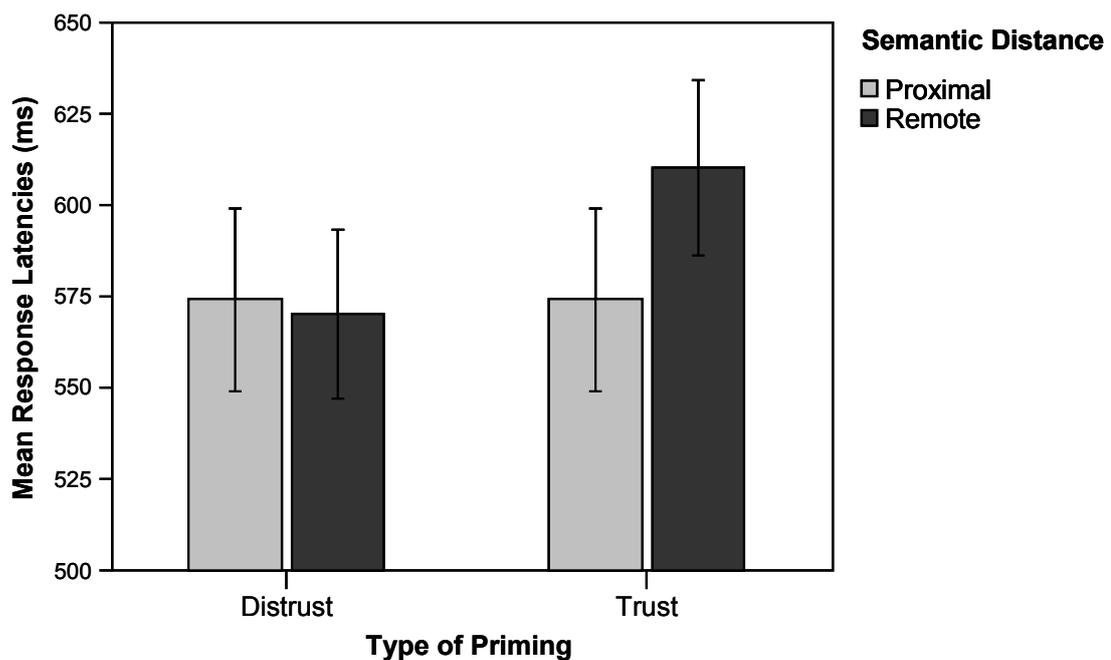


Figure 2. Mean response latencies as a function of type of priming and semantic distance in Study 4. Error bars represent one standard error.

GENERAL DISCUSSION

At first sight, distrust and creativity seem incompatible. Intuitively it seems plausible and natural to assume that distrust thwarts creativity. This is also consistent with empirical evidence so far. Contained, however, in recent findings on the cognitive concomitants of distrust (Schul et al., 1996, 2004, 2008) is the provocative implication that distrust may foster rather than hinder creativity. Suspicious spirits are motivated to find out what the truth or the hidden motive of a potential deceiver might be. To that end, they seem to generate alternative scenarios to the information provided, particularly non-obvious alternatives. In order to serve as useful protection against the impending danger of deception, these non-obvious alternatives must be attuned to the given situation. The qualities of information sought by distrustful individuals fit the definition of creativity—the generation of work that is both novel (i.e., non-obvious) and appropriate (e.g., Sternberg & Lubart, 1999). On the cognitive level, therefore, distrust might very well foster creativity. How can this potentially creativity-enhancing function of distrust be integrated with the empirical evidence demonstrating that distrust hinders creative performance? I propose that whether creative thoughts remain private or are made public constitutes a critical moderating variable: If creative ideas have to be made public to others the social consequences of distrust are likely to prove detrimental to creativity. If creative ideas remain private, however, these social consequences are incapacitated, so that the beneficial cognitive consequences of distrust may develop their creativity-enhancing potential.

In line with this reasoning, the results of Study 1 replicated earlier findings of a detrimental influence of distrust on creativity when ideas generated were allegedly

made public to another participant. Importantly, however, when ideas remained private, the opposite effect emerged: Participants primed with distrust showed enhanced creativity. Results of Study 2 further confirmed the beneficial influence of distrust on creativity in private with a different priming method. Together, these studies thus demonstrate that distrust fosters creativity under conditions of privacy. Furthermore, both studies also shed light on the cognitive mechanism that may underlie this creativity-enhancing effect. Specifically, they suggest that a distrust mindset is accompanied by increased cognitive flexibility in terms of category diversity. Studies 3 and 4 provide further evidence for the role of cognitive flexibility. More specifically, these studies employed more direct measures to tap into two additional indicators of cognitive flexibility, namely category inclusiveness and flat associative hierarchies. In line with my hypotheses, participants primed with distrust exhibited more inclusive categories and increased remote semantic spread.

These findings extend previous research in at least three important ways. First, my work contributes to the research on variables which foster or hinder creativity. More specifically, distrust was identified as a literally “two-faced” predictor with the potential of both fostering and hindering creative performance. Second, my research further adds to our understanding of the cognitive consequences of distrust. It shows that distrust is accompanied by increased cognitive flexibility manifested in category diversity, category inclusiveness, and remote semantic spread. Third, my findings corroborate the suggestion that distrust can be “of value” (Schul et al., 2008). I demonstrate that distrust—a rather undesirable state at first sight—can foster a highly valued and desirable quality like creativity. Moreover, my data indicate that it is

worthwhile differentiating between the cognitive and the social consequences of distrust, as they can sometimes have opposite implications for the same behavior.

In what follows, I address the question of affective states and motivational orientations as possible alternative explanations of my findings. I continue by proposing some implications of my findings for future research into creativity and distrust. I then discuss conceptual limitations of the research presented here and possible future directions for research on the distrust-creativity link. Finally, I suggest practical implications for my findings in real world creativity.

Affective States and Approach vs. Avoidance Orientations as Alternative Explanations?

Ongoing distrust research may mostly be concerned with distrust's rather poorly-researched cognitive consequences. Distrustful states, however, also differ from neutral or trustful states in terms of affective states and motivational orientations, which, in turn, have different implications for information processing and creativity (see paragraph *Creativity from a Social Psychological Perspective* in the *Introduction*). In the following section, I will therefore discuss whether affective states and motivational orientations might account for the results obtained in my studies.

Affective states. In their meta-analysis on the mood-creativity link, Baas and colleagues (2008) stated that “mood stands out as one of the most widely studied and least disputed predictors of creativity” (p. 779). Differences in hedonic tone and activation coming along with experimental manipulations are, therefore, often discussed as alternative explanations in creativity research. This might seem of particular relevance to the research presented in this paper, as distrust is likely to evoke specific

affective states. Compared to trust and neutral conditions, distrust is associated with a more negative affective state that also involves a higher level of arousal (cf., Schul et al., 2008).

Traditionally, positive mood states have been regarded as conducive to creativity (e.g., Davis, 2009; Hirt et al., 2008; Hirt et al., 1997; Isen et al., 1987). Similarly, broad and inclusive categories (e.g., Isen & Daubman, 1984; Isen, Niedenthal, & Cantor, 1992) as well as increased remote semantic spread (Rowe, Hirsh, & Anderson, 2007; Storbeck & Clore, 2008; Topolinski & Deutsch, 2009; Topolinski & Strack, 2009) have been linked to positive affective states. Over time, the picture has become considerably more complex, however. Recently, De Dreu and colleagues (2008) presented evidence that both positive and negative moods can foster creativity provided they are activating in nature, although they seem to do so through different mechanisms: Positive activating moods yield increased creativity through the flexibility pathway. Negative activating moods yield the same effects, but they do so via the persistence pathway.

How do these influences of affective states on creativity relate to my research? First, it is important to keep in mind that the manipulations employed in my studies were quite subtle and specifically designed not to produce substantial differences in hedonic tone and arousal. In fact, additional tests of the priming procedures used revealed no significant differences between the distrust condition, the trust condition,

and the neutral condition in explicit measures of mood and arousal.³ A conceptually similar semantic priming procedure by Rotenberg and colleagues (2010) did not yield significant differences in arousal between a distrust condition and a trust condition, either. Second, even if the priming procedures used had changed affective states to a certain degree not captured by explicit measures, the data are still unlikely to be the result of these variations alone. If anything, affective qualities relevant to distrust yield creativity by increased persistence, not by increased cognitive flexibility (Baas et al., 2008; De Dreu et al., 2008). However, theoretical considerations as well as my data clearly point to increased cognitive flexibility in a distrust mindset. At the same time, measures of persistence in Studies 1 and 2 did not yield differences for the different priming conditions. Together, these findings argue against affective states as an alternative explanation of the data presented.

Approach vs. avoidance motivational orientations. In addition to hedonic tone and arousal, action tendencies in terms of approach vs. avoidance and promotion vs. prevention have been of prominent interest in creativity research (e.g., Friedman & Förster, 2000, 2001, 2002). This seems also relevant to this research, as distrust can be seen as associated with an avoidance orientation (Mussweiler & Burgmer, 2010).

³ Forty-seven people were recruited at a University of Cologne campus. They worked on the subliminal priming procedure (cf., Study 3) and afterwards answered three questions assessing hedonic tone and three questions assessing arousal. Separate three-level ANOVAs for the hedonic tone and arousal scales revealed no significant differences between the three conditions (distrust, control, trust), all $F_s(2, 46) < 1.5$, all $p_s > .23$. A different (online) sample of 43 participants first worked on the scrambled sentences task (cf., Study 2) and afterwards filled in a German questionnaire assessing mood, alertness, and calmness (Steyer, Schwenkmezger, Notz, & Eid, 1997). Separate three-level ANOVAs for all three scales, again, revealed no significant differences between the three conditions (distrust, control, trust), all $F_s < 1$ (cf., Mussweiler & Burgmer, 2010, for the latter data set).

Avoidance and prevention orientations, in turn, have been shown to be negatively related to creativity (e.g., Friedman & Förster, 2000, 2001, 2002). Notably, however, my studies demonstrate an increase in creativity after distrust priming.

Somewhat at odds with the findings just reported is a line of research that links avoidance-related states to a construct related to cognitive flexibility, namely *cognitive control* (Koch, Holland, Hengstler, & van Knippenberg, 2009; Koch, Holland, & van Knippenberg, 2008). Cognitive control is a complex construct that involves (a) shielding against distraction (cognitive stability), and (b) responding flexibly to failure or to critical changes in the environment (cognitive flexibility; cf., Müller et al., 2007). While conducting the research presented here, preliminary evidence has been presented that explicitly links distrust to increased cognitive control (Holland, Koch, Hengstler, Dotch, & van Knippenberg, 2010). This line of research may be interpreted as indicating that avoidance-related states are not necessarily incompatible with increased cognitive flexibility and creativity. This reasoning is supported by the finding of a positive relationship between measures of cognitive control and measures of creativity (Groborz & Nęcka, 2003). Future research seems necessary to further clarify the relationship between approach vs. avoidance-related states and cognitive flexibility/creativity. At this point in time, an unequivocal decision as to whether the avoidance-related qualities of distrust are (at least partly) responsible for the effects found in my studies seems hardly possible. In light of the bulk of research directly linking avoidance-related states to decreased creativity (e.g., Friedman & Förster, 2000, 2001, 2002), it still seems unlikely that approach vs. avoidance orientations alone can account for my results.

Affective states and approach vs. avoidance motivational orientations combined. The aforementioned meta-analysis on the mood-creativity link further proposed that the specific *combination* of hedonic tone, arousal, and action orientation of a particular affective state plays a critical role with regard to creativity (Baas et al., 2008). Taking all three dimensions into account, distrust belongs to the category of negative, activating, avoidance-related affective states. For other affective states in this category (e.g., anxiety), meta-analytic evidence suggests an overall negative influence on creativity, and especially with regard to cognitive flexibility (Baas et al., 2008). Yet, as mentioned before, my data show enhanced cognitive flexibility in a distrust mindset.

In sum, it seems unlikely that my findings are the result of differences in affective states, approach vs. avoidance orientations, or a combination of both.

Implications for Creativity Research

Creativity is predominantly perceived as a positive and desirable quality that produces positive and socially desirable outcomes (e.g., Mumford & Gustafson, 1988). Intuitively, it might therefore feel somehow surprising that unpleasant states or socially undesirable behaviors may lead to creativity. My research contributes to a more complex understanding of creativity by demonstrating that a negatively valued state like distrust has the potential to foster creativity. The findings presented here therefore add to the growing body of research investigating the creativity-enhancing potential of unpleasant or threatening states (e.g., Baas et al., 2008; De Dreu & Nijstad, 2008). Creativity-enhancing effects of such states could be hard to detect at times, because they might be particularly content-specific and context-sensitive, respectively (cf., De Dreu, 2008). Beneficial effects of social conflict on creativity, for example, have been

shown to be specific to conflict-related material (De Dreu & Nijstad, 2008). The data presented here further demonstrate that effects of distrust on creativity are highly context-sensitive. In fact, distrust even has *opposite* effects on creativity depending on whether a task is performed publicly or privately. Similar context-sensitivities may be expected for other variables that have—as in the case of distrust—diverging implications for creativity on the cognitive and social levels.

In such cases, considering a potentially moderating influence of whether creative performance is carried out publicly or privately may prove fruitful to creativity research. Considering private vs. public performance might also be helpful in investigating so-called “malevolent” creativity (Cropley, Kaufman, & Cropley, 2008), i.e., creativity that yields creative but socially undesirable end products. Even though we usually don’t think of lying (Walczyk et al., 2008) or terrorist attacks (cf., Cropley et al., 2008) in terms of creativity, they often meet the criteria by being novel and appropriate means to a specific end. Because instances of malevolent creativity are highly objectionable, creativity in this realm is likely to show up only in private.

In this context, it seems noteworthy that, for a situation to be experienced as public, it does not necessarily have to involve a group setting in which several individuals jointly perform a task. Performance might already be experienced as public when creative ideas have to be spoken out loud, either to an experimenter or to a microphone that serves as a proxy for someone listening. Taking a test for trait creativity might feel public even if the tasks are in written format. The idea that the test instructor is going to look at the results and evaluate them right after the testing is finished may make it quite salient that ideas are not private at all. The creative potential

of individuals high in situational or dispositional distrust might be underestimated in situations like these.

Implications for Distrust Research

With regard to distrust research, the current findings make two major contributions: First, the results of my studies indicate increased cognitive flexibility and increased creativity as consequences of distrust under conditions of privacy. Accordingly, distrust might influence a variety of factors that are associated with flexibility in thinking. In some cases the direction of such effects may be as intuitively unexpected as those for creativity. Second, the results presented here show that distrust can have diverging implications at the cognitive vs. the social level. When researching effects of distrust on other variables, this may be valuable to keep in mind. In the following, I will speculate about possible implications of these findings for three important variables in the interpersonal realm: negotiation, perspective taking, and stereotyping.

Negotiation. At first glance trust seems more compatible than distrust with constructive bargaining behavior and higher joint outcomes. In line with this intuition, there is research showing a positive influence of trust on mutually beneficial outcomes (e.g., De Dreu et al., 1998; cf., Liu & Wang, 2010). Trust seems to further tendencies such as providing/exchanging information (De Dreu et al., 1998) and adopting cooperative goals (Liu & Wang, 2010), which are conducive to attaining mutually-beneficial agreements (e.g., Beersma & De Dreu, 2005; De Dreu & Van Kleef, 2004; Thompson, 1991). Additionally, information search (Sinaceur, 2010; Thompson, 1991) and creative thinking (e.g., Kurtzberg, 1998; Ogilvie & Simms, 2009; see also De Dreu,

Giacomantonio, Shalvi, & Sligte, 2009; Maddux & Galinsky, 2009) have been shown to be beneficial to reaching high joint outcomes. Creativity may be helpful not only in generating new alternatives for potentially mutually-acceptable agreements, but also in asking smart questions when seeking information from the negotiation partner (cf., Kurtzberg, 1998). Interestingly, suspicion has only recently been shown to enhance information search in negotiation (Sinaceur, 2010). My research reveals the potential of unfocused distrust to foster cognitive flexibility and creativity. Contrary to intuition and earlier research, suspicious spirits seem quite well-equipped to contribute to good outcomes in negotiation on the cognitive level. On the social level, however, distrust will keep people from sharing information (e.g., Amabile & Gryskiewicz, 1989; Ekvall, 1996; see also, Liu & Wang, 2010). Suspicion is therefore likely to be beneficial to negotiation only under specific circumstances. In line with this claim, suspicion seems to yield superior negotiation outcomes only when the counterpart is trustful rather than suspicious, and, therefore, willing to provide information (Sinaceur, 2010). In light of the findings presented here it is conceivable that, over and above the heightened tendency to seek information, cognitive flexibility and enhanced creativity may contribute to the beneficial effect of a suspicious negotiator. In fact, one might even speculate that enhanced information search is mediated through flexible and creative thinking which may bring about the need to ask for more information in the first place.

In contrast to creative thinking and the propensity to search for information *in general*, the special case of distrust as a “carrier” of these tendencies seems more context-sensitive: Whereas in general *one* negotiator with the tendency to think creatively or to search for information is *enough* to reach a higher degree of mutual

benefits (Kurtzberg, 1998; Thompson, 1991), in the case of distrust there seemingly *must not be more than one* suspicious negotiator in a dyad.

Perspective taking. Perspective taking is “a cognitive capacity to consider the world from other viewpoints” (Galinsky, Maddux, Gilin, & White, 2008, p. 1048). Perspective taking is usually deemed a socially-desirable capacity that fosters understanding, anticipating others’ reactions and behaviors, and smooth social interactions (cf., Davis, 1983; Galinsky, Ku, & Wang, 2005). Perspective taking has been linked to cooperation (Batson & Moran, 1999) and considered critical in the emergence of altruistic behavior (Batson, 1991). On an intuitive level, therefore, perspective taking and distrust might—again—seem quite incompatible. From a functional perspective, however, getting into a deceiver’s head might be highly adaptive to find out about her hidden motive and to better predict her reactions and behaviors. The cognitive concomitants of distrust certainly provide a solid basis for considering information from other perspectives, with cognitive flexibility specifically having been linked to perspective taking and empathy in neuropsychological research (Eslinger, 1998; Grattan, Bloomer, Archambault, & Eslinger, 1994; Grattan & Eslinger, 1989; Shamay, Aharon-Peretz, Berger, & Tomer, 2001). Furthermore, similarly to what I found for distrust, perspective taking seems to share some characteristics with creative cognition and has been shown to foster creativity (Falk & Johnson, 1977; Galinsky et al., 2008). If distrust is indeed accompanied by enhanced perspective taking, suspicious spirits would come equipped with an important skill for efficiently handling social interactions.

Perspective taking has been linked to a variety of variables, including empathy and prosocial behavior (e.g., Abbate, Isgrò, Wicklund, & Boca, 2006; Batson et al.,

1989; Batson & Moran, 1999; Maner et al., 2002). This seems incompatible with perceived ambiguity about possible malicious motives of a potential deceiver as well as with a general avoidance tendency that accompanies distrust (Mussweiler & Burgmer, 2010). Again, one might expect a divergence between the cognitive capacities for increased perspective taking brought on by distrust and the effects of the social implications of distrust on helping behavior. While the propensity and cognitive preconditions for perspective taking might be particularly high in suspicious individuals, they might still hesitate to help—especially if they cannot come to a conclusion with regard to the motives of the person in need of assistance.

Stereotyping. At first glance, it seems reasonable to assume that distrust yields increased stereotyping and discrimination. In line with this intuition, distrust is usually associated more closely with outgroups than ingroups (cf., Chambers & Melnyk, 2006; Munro, Weih, & Tsai, 2010; Schütte & Kessler, 2007; Voci, 2006). On the other hand, the findings on the cognitive concomitants of distrust from Schul and colleagues (2004, 2008) and the findings presented here seem to converge on the notion that distrust makes people “think outside the box”—a tendency that is fairly incompatible with stereotyping. This notion is, for example, supported by findings that inducing a creative mindset can eliminate automatic stereotype activation (Sassenberg & Moskowitz, 2005). Given that distrust seems to elicit a mindset that shares at least some aspects of a creative mindset, this finding further corroborates the idea of reduced stereotyping in a distrust mindset. If distrust increases perspective taking as discussed above, this suggests another precondition for mitigated stereotyping (e.g., Galinsky & Moskowitz, 2000b; Ku, Wang, & Galinsky, 2010; Shih, Wang, Trahan Bucher, & Stotzer, 2009; Todd, Bodenhausen, Richeson, & Galinsky, in press; Vescio, Sechrist, &

Paolucci, 2003). In line with these findings, Posten and Mussweiler (2010) indeed provided first evidence for *reduced* stereotyping in a person judgment task after subliminal distrust priming. In the control condition, a member of a stereotyped group was judged more stereotypically than an otherwise equivalent member of a non-stereotyped group. After distrust priming, however, the member of the stereotyped group was judged similarly to the member of the non-stereotyped group for whom no differences emerged depending on the priming conditions.

Considering potentially diverging implications of distrust on the cognitive vs. the social level, one might expect a slightly different pattern in social interactions. As mentioned earlier, distrust is accompanied by an avoidance orientation (Mussweiler & Burgmer, 2010). Avoidance orientations usually express themselves in distancing behavior (e.g., Cacioppo, Priester, & Berntson, 1993; Chen & Bargh, 1999; Förster, 2003; Koch et al., 2009). Therefore, it is conceivable that, compared to control conditions, distrust may make people keep a larger physical distance from others—a behavioral indicator repeatedly used in stereotyping research (e.g., Corcoran, Hundhammer, & Mussweiler, 2009; Kawakami, Phillips, Steele, & Dovidio, 2007; Macrae, Bodenhausen, Milne, & Jetten, 1994; Todd et al., in press). When considering only the member of the stereotyped group, one might expect trust and distrust to exhibit opposite effects on expressed stereotypes in a person judgment task vs. social interaction: In person *judgment*, distrust is likely to yield less stereotypical judgments than control conditions (cf., Posten & Mussweiler, 2010). When *interacting* with a stereotyped target (e.g., in a seating distance paradigm, cf., Corcoran et al., 2009; Kawakami et al., 2007; Macrae et al., 1994; Todd et al., in press), however, distrustful people might keep a similar or even larger physical distance than people in trustful or

neutral states. The latter would be interpreted as more stereotyping on a behavioral level. It is important to stress that such an effect would not necessarily mean that people in a distrust mindset *discriminate* more. In fact, it is conceivable that the opposite may be true: Distrustful individuals may be likely to exhibit more pronounced distancing behavior *in general*, but possibly without discriminating between members of stereotyped and non-stereotyped groups. Keeping in mind the potentially diverging cognitive and social consequences of distrust, it seems of particular importance to differentiate between behavioral indicators of stereotyping vs. discrimination.

The Distrust-Creativity Link—Limitations and Future Directions

The present experiments set out to induce distrust while keeping changes in hedonic tone and arousal as minimal as possible (see also Friesen & Sinclair, 2011; Rotenberg et al., 2010; Schul et al., 2004, 2008). Furthermore, the priming manipulations were designed to induce unfocused distrust, i.e., a state that is not directed at a specific source. Therefore, for now, the effects of distrust on creativity must be considered limited to states of unfocused distrust that are not accompanied by substantial negative affect and arousal. In the following section, I will discuss the effects on creativity that might be expected for other forms of distrust.

Negative and arousing distrust and creativity. If distrust involves substantial negative feelings and a substantial degree of arousal, different scenarios seem possible: It is conceivable that the impending danger of deception still spurs the cognitive activities of thinking about multiple, non-obvious alternatives. At the same time, the implications of negative hedonic tone and arousal imply enhanced cognitive persistence rather than cognitive flexibility (De Dreu et al., 2008). Future research is

needed to determine whether a form of distrust substantially negative and activating in nature leads to lowered cognitive flexibility. Alternatively, the cognitive qualities of distrust in terms of enhanced flexibility might become enriched by enhanced persistence. The latter case may reflect a particularly beneficial combination of both the flexibility and the persistence pathway to creativity proposed by the Dual Pathway to Creativity Model (cf., Baas et al., 2008; Nijstad, De Dreu, Rietzschel, & Baas, 2010).

Focused distrust and creativity. Regardless of affective intensity, focused distrust might have different implications for creativity than the form of unfocused distrust investigated in my studies. Focused distrust is directed at a specific person or at a particular source of information (cf., Schul et al., 2008). In cases of focused distrust, resources are quite likely to be directed mostly at the impending deception at hand. According to a motivated focus perspective (cf., De Dreu & Nijstad, 2008) it seems conceivable that creativity in a task unrelated to the origin of distrust might decrease. Parallel to findings by De Dreu and Nijstad (2008) for a conflict mindset, one might still expect suspicious individuals to exhibit particular creativity in performance related to the deceiver or deception. This might show in enhanced creativity in generating different intentions that the potential deceiver might have, or multiple interpretations of the potentially deceptive information provided. This kind of creativity may be revealed in generating tactics for dealing with the situation or getting back at the deceiver (e.g., by deceiving, lying oneself). One might even speculate that the effects of a conflict mindset as realized by De Dreu and Nijstad (2008) are in fact the products of focused distrust elicited by the conflict manipulation.

In the case of focused distrust, it seems advisable to differentiate between extreme forms of distrust and states of “neither-trust-nor-distrust” (Schul et al., 2008,

p. 1301), which have also been specifically referred to as suspicion (Fein, 1996; Schul et al., 1996; Sinaceur, 2010). Whereas suspicious individuals are still undecided about whether the counterpart's motives are benevolent or malevolent, decidedly distrustful individuals act on the firm belief that the other has malevolent motives. Schul and colleagues (2008) argue that the latter form of focused distrust is associated with a specific theory about the particular kind of the deception at hand and its underlying motives. This might in turn yield more rigid information processing focused on the respective theory and cues relevant to this theory (cf., Schul et al., 2008). It is therefore conceivable that focused *suspicion*—which seems quite similar to the diffuse state of unfocused distrust investigated in the studies reported here—may trigger the cognitive activities conducive to creativity, whereas focused *distrust* may not.

Distrust and different kinds of creativity tasks. Overall, my data suggest that distrust—whether focused or unfocused—will foster creativity almost exclusively when creative performance remains private. This should also be true for other creativity tasks that profit from thinking about (remote) alternatives. This seems to be the case for creative insight tasks such as the Duncker candle problem (Duncker, 1935/1963): In the Duncker candle problem participants are provided with a candle, a book of matches, and a box filled with thumbtacks. The task consists of fixing the candle to a cardboard wall so that the candle burns properly and no wax drops on the floor. The solution requires the insight to empty the box and use it as a platform on which to fix the candle. In an experiment by Galinsky and Moskowitz (2000a) participants more often gained this insight if they had been induced to consider alternative outcomes to a given event, i.e., so-called ‘counterfactuals’ (see also paragraph *The Creative Mind of Suspicious Spirits* in the *Introduction*). Thus, it seems

conceivable to expect a beneficial influence of a distrust mindset on creative insight, too. In fact, certain types of creative insight tasks might even constitute an exception regarding the overall detrimental influence of distrust in public settings: In many widely-used creative insight tasks only the final solution is to be made public, while the guesser usually keeps preceding, unsuccessful solution attempts to herself (e.g., Charlie problem [Weisberg, 1988], fake coin problem [e.g., Metcalfe, 1986]). If the accurate solution is unambiguously correct and, therefore, does not involve potential embarrassment when expressed, a distrust mind set might be beneficial to creative performance even in public.

On the other hand, a potentially creativity-enhancing influence of distrust on performance in certain types of creative generation tasks might not even become apparent in a private setting such as that realized in my studies. Graphical generation may constitute such an instance: In a popular example of such tasks, participants are asked to generate a creative drawing of an alien (e.g., Kray et al., 2006; Ward, 1994). In general, we are used to artistic creativity being presented in exhibitions and judged by lay people and art critics. Therefore, artistic creativity may implicitly feel public as soon as it is perceived as part of the experimental session, even if there is no explicit mention of an observer. For distrust to enhance creativity in such artistic tasks, performance might require an extended feeling of privacy. This might be accomplished by ostensibly having participants decide themselves whether they want to hand in their work once they have finished it—a situation similar to how real world artists probably operate. One might also take into account findings from research on social facilitation, which investigates the effects of the presence of others on performance. In this realm, it has been shown that conditions of true privacy, i.e., situations free from evaluation

apprehension, can only be established in tasks that participants perceive as outside the scope of the experiment (Griffin, 2001; Griffin & Kent, 1998; Schmitt, Gilovich, Goore, & Joseph, 1986). One can speculate that the effects of distrust on creativity may be more pronounced in general if a stronger sense of privacy could be established than that realized in the studies presented here.

Cognitive flexibility as a ubiquitous consequence of distrust? Enhanced creative performance in a distrust mindset in public presupposes that cognitive flexibility is a ubiquitous consequence of distrust. Thus far, my data demonstrate enhanced cognitive flexibility in situations of privacy only, as cognitive flexibility captured by category diversity was reduced after distrust priming in the public condition of Study 1. There are at least two explanations for this pattern of data: First, it is of course possible that distrust indeed reduces cognitive flexibility in a public setting. Second, a tendency for distrustful individuals to withhold potentially embarrassing or valuable—i.e., *original*—ideas, in particular, might yield the same data pattern without necessarily indicating decreased cognitive flexibility: If some of these withheld original ideas were the only ones derived from a particular category, withholding those ideas would equal reduced category diversity.

From a functional perspective, the latter explanation seems more convincing to me: If cognitive flexibility as a consequence of distrust has evolved as a means to defend oneself against deception attempts, it would seem adaptive that distrust be accompanied by cognitive flexibility no matter what the circumstances. To determine whether distrust actually induces cognitive flexibility in public performance situations as well, it might be worthwhile to investigate category inclusiveness and remote semantic spread (Studies 3 and 4) in a public context. In tasks like these, traces of

cognitive flexibility may become apparent even in public because the danger of embarrassment or negative consequences seems largely nonexistent. If indeed cognitive flexibility were a consequence of distrust in general, then effects of distrust on creativity should be mediated by measures of cognitive flexibility only when creative output remains private, but not when it is to be made public.

Practical Implications

In this series of studies, I demonstrate that inducing a state of unfocused distrust can have considerable impact on creativity. Such distrustful states might reflect an overall suspicious personality, a generally distrustful climate in an organization, or the reality of a group setting in which the members don't know what to expect from each other (cf., Schul et al., 1996, 2008). The research presented here shows that *private* creativity is not necessarily hampered by such a distrusting state of mind, but rather that it is enhanced. On the downside, results from Study 1 also show that this subtle form of distrust is enough to disrupt creative performance in public. If public performance is necessary for creativity to pay off, it therefore still seems reasonable to promote a climate of trust. Public performance might even have beneficial effects on creativity in such a climate. Indeed, participants primed with trust in Study 1 tended to perform better in public compared to those in the private condition. One might speculate that this might be due to somewhat increased arousal brought on by public performance (cf., Byron, Khazanchi, & Nazarian, 2010). Positive, activating, and approach-oriented affective states (e.g., happiness) have proven particularly conducive to creativity (Baas et al., 2008).

With regard to an applied context, it would be highly desirable to be able to profit from the (cognitive) benefits of distrust without having to deal with its detriments. Methods to elicit such states of “positive” suspicion might even be useful in deliberately increasing creative cognition at work or in educational settings. Is there such a thing as positive suspicion? Imagine yourself in the circus watching a magician performing magic tricks. You are pretty sure that appearances are not true—the rabbit most certainly did not get into the magician’s hat through some magical or psychic method, yet you have no idea how the rabbit really got there. You might be amazed by the performance and in a cheerful, excited mood. Additionally, your mind might be tuned to testing multiple, rival, rather remote alternatives for the way the rabbit really did get into the hat. The present findings suggest that on your way home from the circus, you might well be in the right state of mind to finally come up with that earth-shaking research project or the ultimate birthday gift for your in-laws.

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