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Deindividuation and Antinormative Behavior: A Meta-Analysis

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A meta-analytic integration reviews evidence for deindividuation theory as an explanation of collective and antinormative behavior. Deindividuation theories propose a subjective deindividuated state that causes transgression of general social norms. Deindividuation research classically manipulates anonymity, self-awareness, and group size. Results of 60 independent studies showed little support for (a) the occurrence of deindividuated (antinormative) behaviors or (b) the existence of a deindividuated state. Research results were explained more adequately by situation-specific than by general social norms. Analyses indicated that groups and individuals conform more to situation-specific norms when they are "deindividuated." These findings are inconsistent with deindividuation theory but support a social identity model of deindividuation effects.

Deindividuation is one of the most widely cited effects of social groups. Theories of deindividuation propose that it is a psychological state of decreased self-evaluation and decreased evaluation apprehension causing antinormative and disinhibited behavior (Diener, 1980; Festinger, Pepitone, & Newcomb, 1952; Zimbardo, 1969). The phenomenon of deindividuation appears to be empirically well established, and most social psychology textbooks published since 1980 portray it as robust and as having known effects (Aronson, 1992; Aronson, Wilson, & Akert, 1994; R. A. Baron & Byrne, 1994; R. M. Baron & Graziano, 1991; Baum, Fisher, & Singer, 1985; Brewer & Crano, 1984; Brigham, 1986; Deaux & Wrightsman, 1995; Feldman, 1995; Forsyth, 1987, 1990; Franzoi, 1996; Gergen & Gergen, 1981; Lippa, 1994; Myers, 1993; Penner, 1986; Perlman & Cozby, 1983; Sabini, 1995; Shaw, 1981; Sherrod, 1982; Taylor, Peplau, & Sears, 1994; Tedeschi, Lindskold, & Rosenfeld, 1985; Williamson, Swingle, & Sargent, 1982). Major researchers in the field support this favorable view of deindividuation theory. For instance, Prentice-Dunn (1991) claimed that "two decades of research have now demonstrated the validity of the deindividuation construct" (p. 16).

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Deindividuation theory seeks to provide an explanation for various expressions of antinormative collective behavior such as violent crowds, mindless hooligans, and the lynch mob. The aim is to explain "what forces crowd members at times to behave in uncivilized and violent ways" (Diener, 1976, p. 497). Deindividuation theory has been applied to social atrocities such as genocide (Staub, 1996; Staub & Rosenthal, 1994). More recently, the theory has been used to account for antinormative social behavior in other domains such as computer-mediated communication (Kiesler, Siegel, & McGuire, 1984; Kiesler & Sproull, 1992) and group decision support systems (Jessup, Connolly, & Tansik, 1990). As an indication of its popularity and status, deindividuation theory is now even being admitted as legal grounds for extenuation in murder trials in some countries (Colman, 1991).

No comprehensive and systematic reviews of the deindividuation literature have been reported since 1977, and no quantitative integration has, to our knowledge, been conducted. The two major research reviews (Diener, 1977; Dipboye, 1977) did not show unequivocal support for the deindividuation hypotheses and criticized some aspects of deindividuation research. They did not draw firm conclusions about the existence of a deindividuated state and its presumed effects, despite the status of the deindividuation construct. A comprehensive review of the deindividuation literature is therefore needed for several reasons. Apart from reexamining evidence for deindividuation theory incorporating the studies conducted since the late 1970s, it is important to evaluate the contemporary versions of the theory that have appeared subsequently (Prentice-Dunn & Rogers, 1982, 1989) and, in particular, to assess the evidence for the mediating role of the deindividuated state proposed therein. In this article, we also evaluate recent alternatives to deindividuation theory (e.g., Reicher, Spears & Postmes, 1995). These questions are addressed by means of meta-analytic procedures (Cooper & Hedges, 1994; Rosenthal, 1991). First we describe the theoretical development and different formulations of deindividuation theory together with some examples of classic studies. We then briefly consider recent alternative explanations for deindividuation effects before outlining the specific focus of the meta-analysis.

Deindividuation: Developments in Theory and Research

One of the difficulties in evaluating or even referring to deindividuation is that this term has evolved over the years, and its meaning has shifted in focus. Indeed, part of the impetus for our research has been to define precisely what deindividuation is so as to better account for research effects. Rather than preempt issues of definition in this section, we refer more generally to "deindividuation effects" as outcomes associated with the different developments of the theory. We present an overview of how deindividuation has developed to provide insight into the origins and meaning of the theory, concluding with the most contemporary theoretical understanding. This clarification is necessary to focus the meta-analysis on relevant mediating processes associated with the latest theorizing. We also provide illustrative research to show how deindividuation phenomena have been assessed.

Deindividuation theory is based, to a large extent, on the classic crowd theory of Gustave Le Bon (1895/1995). In his influential book *The Crowd: A Study of the Popular Mind,* Le Bon vividly described the transformation of the individual in the crowd. According to Le Bon, the psychological mechanisms of anonymity, suggestibility, and contagion combine to change an assembly into a "psychological crowd." In the crowd, the "collective mind" takes possession of the individual, who as a consequence is reduced to an "inferior form of evolution" (p. 40). Thus, the individual submerged in the crowd loses self-control and becomes a mindless puppet capable of violating personal or social norms.

Le Bon's theory was reintroduced into mainstream social psychology by Festinger et al. (1952), who couched it in more scientific terms. They described deindividuation as a state in which individuals are not "seen or paid attention to as individuals" (Festinger et al., 1952, p. 382) when they are in a group. They stated that "under conditions where the member is not individuated in the group, there is likely to occur for the member a reduction of inner restraints against doing various things" (Festinger et al., 1952, p. 382). In crowds or groups, then, members do not pay attention to other individuals as individuals and do not feel scrutinized. Being unidentified and thereby unaccountable has the psychological consequence of reducing inner restraints and increasing behavior that is usually inhibited. Thus, like Le Bon, Festinger et al. conceived of deindividuation as a loss of individuality through submergence in the crowd. Festinger et al. did not hypothesize, however, that the loss of individuality is replaced by a collective mind that guides the crowd's actions. Rather, the loss of individuality removes individual controls, which, according to Festinger et al., releases a person from internalized moral restraints.

Zimbardo (1969) extended and developed deindividuation theory; he presented a theoretical framework specifying the input variables leading to deindividuation and the resulting output behavior. A variety of circumstances can lead to a deindividuated state, according to this theory. The most important are anonymity, loss of individual responsibility, arousal, sensory overload, novel or unstructured situations, and consciousness-altering substances such as drugs and alcohol. These circumstances lead to "deindividuated behaviors" that can be broadly described as "behavior[s] in violation of established norms of appropriateness" (Zimbardo, 1969, p. 251). More specifically, Zimbardo referred to emotional, impulsive, irrational, regressive, and intense behavior. This behavior is no longer under "stimulus control," is self-reinforcing, and, as a consequence, is difficult to terminate. Zimbardo stressed that deindividuated acts can, in fact, be prosocial, although his focus was almost exclusively on antisocial behavior. Unlike Le Bon (1895/1995) and Festinger et al. (1952), Zimbardo did not view deindividuation exclusively as a group phenomenon, applying the concept to suicide, murder, and interpersonal hostility. Zimbardo was unfortunately less precise about the subjective changes that constitute the deindividuated state. His model specified that deindividuation causes a minimization of self-observation, self-evaluation, and concern for social evaluation. This leads to a weakening of controls based on guilt, shame, fear, and commitment, which in turn leads to lowered thresholds for the expression of inhibited behavior.

Zimbardo's (1969) paper on deindividuation reported three experiments that were very influential and formed a blueprint for much subsequent deindividuation research. In these studies, Zimbardo manipulated anonymity by clothing participants in oversized lab coats and hoods, as compared with normal clothes and name tags in the control condition. The participants' task was to shock a confederate using a modified Buss (1961) aggression machine, supposedly because it was necessary to become "actively involved" with this person. In a first experiment using groups of 4 female students, Zimbardo found that anonymous participants seated in separated cubicles shocked longer than identifiable participants. A second study using soldiers showed the exact opposite, however: Identifiable soldiers shocked longer. Zimbardo suggested that the soldiers may have felt isolated and individuated from their fellow soldiers as a result of the anonymity manipulation. Despite the empirical problems, however, Zimbardo's procedure has been used by many other experimenters.

Diener (1980) refined Zimbardo's theory by being more specific about the psychological mechanism causing deindividuation. Diener's (1977) review touched on a number of deficiencies in the research literature. Central to these problems was that "input variables seem to produce complex behavioral effects and do not uniformly disinhibit behavior" (Diener, 1977, p. 152). Diener asserted that the inconsistent support for the deindividuation hypothesis could be caused by the lack of concern with the internal, psychological changes that constitute deindividuation. In his view, the demonstration of an internal state of deindividuation is central to the validity of the construct, and much research did not fulfill this demand. As a consequence, Diener's (1980) theory of deindividuation elaborates how deindividuation comes about through decreased self-awareness (Duval & Wicklund, 1972; Wicklund, 1975). When attention is drawn outward and away from the self, conscious deliberation of behavior is undermined. As a result, the individual loses the capacity to monitor and plan behavior and to evaluate actions in terms of internal standards. An increased responsiveness to environmental cues thus takes the place of rationally planned action. According to Diener, "The deindividuated person, being quite reactive to immediate stimuli and affect, is similar to the

stimulus-response organism of early behaviorism, with reduced conscious mediation" (1980, p. 230).

Aware of some of the limitations in terms of external validity in the shock paradigm, Diener and associates also devised some more realistic and naturalistic contexts in which to test this deindividuation theory. For example, Diener, Westford, Dineen, and Fraser (1973) used a paradigm called "beat the pacifist" (for similar studies, see Diener, 1976; Diener, Dineen, Endresen, Beaman, & Fraser, 1975; Rogers & Ketchen, 1979). In this paradigm, groups of participants are required to "test" a pacifist, trained to remain nonresponsive, by hitting him or her with foam swords and so forth. The researchers claimed that this paradigm provided a measure of aggression that was more reliable than in the electric shock paradigm. Results showed, surprisingly, that anonymity had no overall effect on aggression. However, individuals displayed much more aggression than groups. In addition, an interaction between anonymity and group immersion was found such that identified individuals were most aggressive, followed by anonymous individuals. Groups were less aggressive than individuals, with identified groups being least aggressive of all. Another more naturalistic paradigm was the "trick-or-treat" paradigm in which children were observed on Halloween. This field setting was used to assess increases in antinormative behavior (i.e., stealing) as a function of the deindividuation variables of anonymity and group size (e.g., Diener, Fraser, Beaman, & Kelem, 1976). Unfortunately, the use of these more naturalistic paradigms made it difficult to assess the mediating role of self-awareness and rule out the possibility that a fear of being caught may have contributed to such effects. In a more direct attempt to determine the mediating role of self-awareness, Diener (1979) manipulated self-awareness (non-self-aware vs. self-aware conditions). In addition, he included a deindividuation condition designed to create a unified group, produce arousal, and deflect from individual identity. Although the deindividuated condition resulted in the most disinhibited behavior, it was not clear whether this finding could be attributed to reduced self-awareness or to other aspects of the deindividuation manipulation.

Prentice-Dunn and Rogers (1982, 1989) voiced concern about the disappointing correspondence between reduced self-awareness and antinormative behavior. To account for the inconsistencies, they developed a further extension, the "differential self-awareness theory," by applying the private–public distinction in self-awareness (Carver & Scheier, 1981; Fenigstein, Scheier, & Buss, 1975) to deindividuation theory. According to differential self-awareness theory, there are two routes to disinhibited collective behavior. On one hand, "accountability cues," such as anonymity and diffusion of responsibility, decrease *public self-awareness.* As a result, crowd members are less concerned with evaluations and do not expect to suffer negative consequences for their behavior. This process resembles the original deindividuation theory of Festinger et al. (1952). According to this line of thought, the individual is not necessarily unaware of behavior but knows that it will go unpunished. On the other hand, "attentional cues," such as group cohesiveness and physiological arousal, decrease *private self-awareness:* They draw attention away from oneself and one's own behavior.[1] This causes an internal deindividuated state (composed of reduced private self-awareness and concomitant altered thinking) resulting in decreased self-regulation and attention to internalized standards for appropriate behavior. Prentice-Dunn and Rogers (1989) argued that antinormative and disinhibited behavior can result from both processes, but only the reduced private self-awareness route was defined as deindividuation.

Prentice-Dunn and Rogers (1982) tested their formulation using an external attentional cues manipulation within a paradigm similar to that of Zimbardo (1969). This deindividuation manipulation involved repeated instructions to the participant to focus attention outward. Also, participants were seated in a dimly lit room with loud rock music playing, verbal interaction was encouraged, and the groups played exciting video games. In contrast, participants in the internal attention focus condition were told not to interact, performed individual tasks, and played nonarousing games in a well-lit and quiet room. The hypothesis that external attention would lead to higher levels of aggression was supported. This theoretical development and empirical demonstration would therefore seem to provide a welcome further clarification and respecification of the deindividuation hypothesis.

However, evidence for the proof of the mediating role of the subjective state—and of self-awareness in particular—remains more equivocal than secondary sources might suggest. Few if any studies leading up to the most recent formulation reported the path analyses that would be necessary to provide evidence of mediation (R. M. Baron & Kenny, 1986). In the study of Prentice-Dunn and Rogers (1982), the path coefficient was significant for an altered states factor but not for private self-awareness (p. 509). Although self-awareness did appear to mediate in an earlier study (Prentice-Dunn & Rogers, 1980), the self-awareness factor in this earlier research also included elements of accountability and public self-awareness (p. 109) excluded by the subsequent theoretical formulation. In short, mediation by private self-awareness remains an empirical issue, and it was a central focus in the present analysis.

This brief historical review should make clear certain shifts in the usage and meaning of deindividuation. In the seminal work of Festinger et al. (1952), deindividuation was closely associated with the feeling of not being scrutinized or accountable when submerged in the group. Based on this, Zimbardo (1969) attempted to define the range of input variables that could induce the state and its effects. For Zimbardo, deindividuation involved feelings of reduced self-observation. This still maintains elements of accountability to an audience (hence Zimbardo's emphasis on anonymity in the group as the most important input variable). For Diener, reduced self-awareness was clearly seen as the defining feature of the state (Diener, 1977, 1980). Although he was critical of some of the input

[1] It should be noted that this line of reasoning appears to be contradicted by more recent research concerned with the link between affect or arousal and self-focused attention. For example, research conducted by Wood, Saltzberg, and Goldsamt (1990) suggests that a sad mood results in increased self-focus, and Eisenberg and colleagues have shown that physiological arousal can result in a self-focused personal distress response (Eisenberg et al., 1991, 1994). This point is addressed further in the Discussion section.

factors suggested by Zimbardo (especially anonymity, which may sometimes increase self-awareness; Diener, 1980, p. 222), he extended and refined deindividuation theory rather than redefining it. We refer to these original statements as *classical deindividuation theory.* Prentice-Dunn and Rogers further narrowed down the role of self-awareness to reduced private self-awareness. We refer to this latest position of Prentice-Dunn and Rogers (1982, 1989) as *contemporary deindividuation theory.* The main point that distinguishes contemporary from classical deindividuation theory is the elimination of the conscious accountability associated with the fear of sanction present in Festinger et al. (1952) and Zimbardo (1969); this remained somewhat ambivalent in Diener (1980) but was explicitly excluded in Prentice-Dunn and Rogers (1982, 1989). Classical and contemporary views agree, however, on the main thrust of the deindividuation hypothesis: The psychological state of deindividuation brings about antinormative and disinhibited behavior.

Alternative Normative Explanations for Deindividuation Effects

This brief overview demonstrates that, despite its popularity, the deindividuation construct has not had an easy ride over the years. Part of the problem is empirical, with the reviews by Diener (1977) and Dipboye (1977) both pointing to the heterogeneity of deindividuation effects, epitomized by the contrasting findings obtained by Zimbardo (1969). Doubts have also been raised about the external validity of deindividuation research. It could be argued that successive attempts to refine the deindividuation concept have sometimes lost sight of the dynamic intergroup context of collective behavior that it purports to model (Reicher et al., 1995). One possibility that deindividuation theory seems to neglect is that crowd behavior—and, perhaps, deindividuation effects—may actually be the product of local group norms. This idea is not new. Influential theorists have argued that crowd behavior is guided by norms that emerge in the specific context (R. H. Turner & Killian, 1972). A normative approach might also help to explain the variability of some deindividuation effects (especially as found with manipulations of anonymity). At a very general level, it seems odd that whereas both classical and contemporary deindividuation theory argue that immersion in the group can routinely produce antinormative behavior, an equally classical tradition within social psychology has shown that the presence of the group produces conformity to group norms and standards (e.g., Deutsch & Gerard, 1955; Sherif, 1936; J. C. Turner, 1991). At the more operational level of the research paradigms used, the scope for such contrasts is equally apparent. In his classical studies of obedience to authority, Milgram (1974) demonstrated conformity to the experimenter's demand to administer electric shocks to a confederate. Although there are clearly differences with deindividuation experiments, the use of a modified Buss aggression procedure in both paradigms is remarkably similar. It is therefore notable that whereas Milgram's studies focused on the power of the experimenter to elicit "shocking" behavior, the role of context and experimenter is usually not considered in the deindividuation paradigm.

These comparisons raise the question of by what criteria behavior can be considered normative or antinormative. Some have questioned the predictive utility of general social norms, arguing that norms are variable and situation specific (Lindskold & Propst, 1980; Reicher et al., 1995; Singer, Brush, & Lublin, 1965). The distinction between general social norms and more specific situational norms or demands is of critical theoretical importance. Because both classical and contemporary deindividuation theory have defined antinormative behavior in relation to general norms of conduct (e.g., aggressive behavior is antinormative), they tend to neglect the possibility that such behavior might actually be normative with respect to norms or demands in situ.

In terms of research in the deindividuation paradigm, the idea that behavior could be the result of local group norms was considered explicitly by Johnson and Downing (1979), who varied the manipulation of anonymity developed by Zimbardo. Participants were made anonymous by means of mask and overalls reminiscent of the Ku Klux Klan (as in Zimbardo's, 1969, study) or by means of nurses' uniforms. Although, in comparison with the control condition, participants shocked somewhat more when dressed in the Ku Klux Klan uniforms (but not reliably so), they actually shocked less when dressed as nurses. This finding is more in line with a normative explanation, participants being sensitive to normative cues associated with their clothing. It is also possible to apply normative explanations to some of the anomalies found in the classic studies. For example, the greater aggression shown by the Belgian soldiers when in uniform rather than anonymous (Zimbardo, 1969) might make sense in terms of the norms associated with a military identity (see Reicher et al., 1995, for a discussion of this and other deindividuation effects).

Recently, researchers working within the framework of social identity theory (e.g., Tajfel & Turner, 1986) have tried to provide an alternative explanation for certain deindividuation phenomena that takes into account sensitivity to norms that are salient in the context. This approach diverges from both classical and contemporary deindividuation theory and is referred to as the social identity model of deindividuation effects (SIDE; Reicher et al., 1995; Spears & Lea, 1992, 1994). In line with the classical research on group conformity mentioned earlier, this framework argues that deindividuation manipulations, such as the combination of anonymity, group cohesiveness, and group immersion, can actually reinforce group salience and conformity to group norms. Moreover, in line with the earlier distinction, the SIDE model predicts conformity to norms associated with the specific social identity or group rather than conformity to any general norms.

Although the SIDE model makes predictions opposed to both classical and contemporary deindividuation theory, the focus on anonymity arguably makes it more comparable with the classical form of the theory. However, because group immersion and other manipulations designed to reduce self-awareness in the group can influence the salience of group identity, effects produced in the context of contemporary deindividuation theory are also open to reinterpretation. For example, the individuating instructions in the research of Prentice-Dunn and Rogers (1980, 1982) tended to emphasize the salience of individual identity, whereas in the deindividuated condition, the dimly lit room and cohesive-

ness inductions may also have enhanced the interchangeability of group members, reinforcing group salience (Reicher et al., 1995). If the male college students participating thought that aggression was expected and consistent with their group identity, the SIDE model would also predict greater aggression under such deindividuating conditions. More direct manipulations of private self-awareness in which participants are placed in front of a mirror (e.g., Froming, Walker, & Lopyan, 1982) may also focus attention on individual identity (perception of oneself as a unique individual rather than as a group member). Indeed, in the study conducted by Froming et al. (1982), the effect of private self-awareness was moderated by the participants' expectations of others' norms. Participants who were low in private self-awareness shocked more when they believed other people favored it and less when they believed others were against shocking, a finding more consistent with sensitivity to normative standards than with the contemporary theory.

In sum, although contemporary deindividuation theory provides a welcome attempt to resolve some of the anomalies in the deindividuation literature, as well as providing insights into the mediating processes involved, questions still remain. Specifically, recent theoretical developments and empirical research suggest that normative processes may also operate in the deindividuation paradigm and may help to account for some of the anomalies, especially once specific situational norms and demands are distinguished from the more general social standards typically used to predefine antinormative behavior.

Focus of the Meta-Analysis

The object of the present analysis was to examine the hypothesis, put forward by both classical and contemporary deindividuation theory, that deindividuation is the cause of antinormative and disinhibited behavior. The approach taken was to examine evidence in a systematic quantitative integration focusing on two aspects of the literature. First, we examined the effects of certain input variables designed to bring about antinormative behavior. These input variables (such as anonymity and group size) are associated with classical deindividuation theory (Festinger et al., 1952; Zimbardo, 1969), as well as more recent normative explanations of deindividuation effects (such as the SIDE model). Previous reviews noted the variability in effects produced by these factors (Diener, 1977, 1980), so we focused special attention on explaining such variability. Second, we examined effects on antinormative behavior of input variables that induce the deindividuated state directly (such as manipulations of self-awareness) and examined the mediating processes proposed by contemporary deindividuation theory. A central goal of our analysis was to distinguish between general social norms and specific situational norms as a means of evaluating claims as to the antinormative nature of deindividuation effects. The specific objectives and choice of variables are now further elaborated.

Method

Operational Definitions and Overview

Deindividuation is characterized as a state of lowered (private) self-awareness and self-regulation in a group. The result of this state is antinormative behavior: acts that violate established norms of appropriateness. This meta-analysis focused on studies (a) with the object of inducing a psychological state of deindividuation and (b) examining some form of antinormative behavior. It is useful in this respect to distinguish the deindividuation manipulations from the mediating deindividuated state, which in turn is different from (and hypothesized to be responsible for) the deindividuated behavior (the dependent variable).

Independent variables. With regard to deindividuation manipulations, many factors may induce a psychological state of deindividuation (Zimbardo, 1969). The operational manipulations have nevertheless been relatively few. One can distinguish manipulations of the situational context thought to foster a state of deindividuation (i.e., placing people in groups, anonymity manipulations, and inductions of arousal and cohesiveness) from manipulations inducing the state of deindividuation directly (i.e., manipulations of self-awareness).

With respect to manipulations of the situational context, manipulations of group size go to the heart of deindividuation theory: Both classical and contemporary deindividuation theory assume that deindividuation is a group phenomenon. Anonymity has been central to classical deindividuation theory. Various theorists have suggested that it is necessary to distinguish targets of anonymity, such as anonymity to the in-group and to the out-group (Diener, 1977, 1980; Lindskold & Propst, 1980; Reicher & Levine, 1994a; Reicher et al., 1995). Anonymity to the in-group means that the (antinormative) responses under observation are anonymous to other participants in the study (i.e., one's own group), whereas the identifiability to others is constant across conditions. Anonymity to the out-group means that responses are anonymous to the experimenter or to the target of antinormative behavior, whereas identifiability to other participants is kept constant.

Finally, there are compound manipulations of deindividuation that tend to focus on combinations of the contextual manipulations just described; an example is combining anonymity to in-group and out-group with arousal manipulations, cohesiveness, loud noise, and various group activities (e.g., Diener, 1979; Prentice-Dunn & Rogers, 1980, 1982; Prentice-Dunn & Spivey, 1986; Rogers & Prentice-Dunn, 1981; M. J. White, 1977). These high-impact manipulations are especially relevant as assessments of contemporary deindividuation theory because they contain elements, such as arousal and cohesiveness, that are deemed responsible for a deindividuated state.[2] Although other manipulations have been used, they are not common enough to allow a systematic examination in the form of a meta-analysis.

With respect to manipulations of the state of deindividuation, reduced self-awareness is the key psychological constituent. The distinction between manipulations of private and public self-awareness is relevant, with contemporary deindividuation theory defining reduced awareness of the private aspects of the self (e.g., personal norms) as the core psychological process responsible for the deindividuated state. Classical deindividuation theory focuses on self-awareness as a unitary construct

[2] Unfortunately, no studies isolated cohesiveness, and only three tests isolated arousal with the purpose of inducing deindividuation (Diener, 1976; Diener, Westford, Diener, & Beaman, 1973; Rogers & Ketchen, 1979). Conducting a meta-analysis of such a small sample would amplify the problem of sampling bias beyond the point at which inferences would be meaningful (e.g., Matt & Cook, 1994), especially when studies are conducted under different conditions. Thus, we preferred to conduct a meta-analysis on the compound manipulations incorporating these factors, even though the use of compound manipulations of cohesiveness, arousal, and other deindividuating factors limited the strength of possible inferences.

(Diener, 1977, 1980; Zimbardo, 1969; see Wicklund & Gollwitzer, 1987, for a critique of the private–public distinction).[3]

Mediating variables. Earlier reviewers have stressed the importance of examination of the psychological construct of deindividuation (Diener, 1977, 1980; Dipboye, 1977). Yet, the examination of the psychological process is far from straightforward. One problem is that the self-report measures typically deployed are inherently reactive: Asking people to reflect on their mental processes may increase self-awareness and thus work against the experimental manipulations intended to reduce it (Prentice-Dunn, 1991). A potential solution would be to examine self-references in speech or writing as an index of self-awareness (D. Davis & Brock, 1975), but this measure has never been used in the context of deindividuation research.

Another problem is the lack of continuity in operationalizations. Despite attempts to operationalize the state as reduced self-awareness or, more exclusively, reduced private self-awareness (Prentice-Dunn & Rogers, 1983), factor analyses of similar self-report items have produced divergent results. Thus, Diener (1979) devised a questionnaire yielding a two-factor solution; the self-awareness factor was composed of decreased self-consciousness, liking for the group, and a lack of concern with evaluation, and the altered experiencing factor was composed of an altered subjective state and loss of individual identity. Using the same questionnaire, Prentice-Dunn and Rogers (1980) found a self-awareness factor composed of decreased self-consciousness, a loss of individual identity, and lack of concern with evaluation and an altered experiencing factor composed of liking for the group and an altered state. Rogers and Prentice-Dunn (1981), again using this questionnaire, found a five-factor solution with entirely different results. Thus, there has been a lack of consistency in the nature of the results obtained.

Finally, despite strong injunctions, very few studies have measured the mediating construct at all. In the limited sample of studies that have measured the deindividuated state, three types of measures can be distinguished: measures of self-awareness and the subdivided private and public self-awareness measures. The mediating role of these constructs will be assessed in a separate meta-analysis.

Dependent variables. Antinormative behavior has been operationalized relatively consistently across studies. The most common operationalization is the administration of electric shock or loud noise. Some studies measure the amount of behavioral or verbal disinhibition. Amount of stealing or cheating is usually examined in field settings. Less frequent operationalizations are the expression of undesirable attitudes (experimenters have assumed that it is obvious or explicit which attitudes are desirable and which are not) and the failure to act prosocially (e.g., absence of helping behavior when such behavior is considered appropriate). Each of these operationalizations is further illustrated subsequently.

Overview of analyses. The first part of the meta-analysis focused on the relation between independent and dependent variables. We examined the aggregate effect of manipulations, as well as the independent effects of single types of manipulations. The indirect manipulations of contexts hypothesized to activate deindividuation (such as anonymity) provide information about the relation between "antecedent input variables" and "output behaviors" that theorists have predicted (e.g., Zimbardo, 1969). Direct manipulations of the psychological process responsible for deindividuation provide information about the impact of this causal process on antinormative behavior (N. Miller & Pollock, 1994) and, as such, allow an evaluation of claims about the causality of the mediating factors of self-awareness (classical deindividuation theory: Diener, 1980; Zimbardo, 1969) and private self-awareness (contemporary deindividuation theory: Prentice-Dunn & Rogers, 1983, 1989).

The analysis was further refined by examining the role of moderating variables. Moderators can potentially distinguish circumstances under which the hypothesized relation between the independent and dependent variables is strong from circumstances in which this relation is weaker. As such, moderators can be useful in explaining variability of results and gaining a more sophisticated understanding of the effects of independent variables. The specific moderators considered are outlined in more detail subsequently.

The second part of the analysis examined the mediation of the independent–dependent variable relation by the deindividuated psychological state. This involved examination of those cases in which the mediating construct was measured by the experimenter. Through a series of regression analyses, the effect of the mediator can be partialed out to assess its role in causing deindividuation effects (R. M. Baron & Kenny, 1986; Judd & Kenny, 1981). Although this does not provide complete evidence for the existence of a causal relation (N. Miller & Pollock, 1994), it is generally used as an indicator of a causal link. Direct manipulations of the mediating process (i.e., manipulations of self-awareness) provide more definite evidence of causality, however.

Literature Search and Eligibility Criteria

A literature search was conducted to locate all (quasi-)experimental investigations of deindividuation. We performed a computerized search of *Psychological Abstracts* via PsycLIT on CD-ROM and a computerized search of *Dissertation Abstracts.* These databases contain journal articles from 1972 onward and dissertations from 1960 onward. Keywords used were *deindividuation, self-awareness,* and various combinations of the search terms *antinormative, aggression, group,* and *anonymity.* References from the publications found were examined to trace further journal articles and unpublished reports, especially to locate sources not recorded in the databases. Sources with publication dates predating the accessed database records were thus retrieved as well. In addition, a query was sent to prominent researchers in the field for unpublished reports with regard to deindividuation, and a modest number of studies were obtained in this way. Four of the 50 reports eventually retained in the analysis were derived from unpublished sources.

Criteria for eligibility in the meta-analysis were as follows. Only experimental studies or quasi-experimental field studies that had antinormative or disinhibited behavior as a dependent variable were included. In addition, studies had to manipulate one or more of the factors anonymity, group size, and self-awareness as an independent variable. The criteria were applied to select an initial sample of the literature that seemed fit for inclusion. This selection was further refined after study characteristics had been rated by independent coders.

Coding of Characteristics and Moderators

The initially selected publications ($N = 61$) were subsequently rated by three independent coders on a number of study characteristics. The coders were advanced psychology students unaware of the study results and hypotheses and of the purpose of their work. They were given a copy of the method section and the paragraph of the results section describing the sample of each study that could potentially be included in the analysis. They coded various objectively verifiable characteristics of the study and the design: year of publication, independent manipulations, whether confederates were used, whether confederates were unaware of the experimental hypothesis, the size of the experimental

[3] It might be confusing that self-awareness is the independent variable in some cases and the mediating variable in other cases. Manipulations of self-awareness directly activate the psychological process that defines deindividuation. Measures of self-awareneness as the mediating construct, however, are informative about the role that self-awareness plays in the effects of certain social contexts on producing antinormative behavior.

groups, what types of participants were used (students, children, or others), and what percentage of participants were male. Coders agreed almost completely on all of these ratings, which is unsurprising given that this information could be copied almost verbatim from the method sections (Cohen's κ values ranged from .77 to 1.00).

Coders further rated the nature of the dependent measures. These subjective ratings were made on 7-point Likert-type scales. Coders indicated what, in their opinion, was the general social norm with regard to the dependent variable: whether they thought the dependent variable measured behavior that would be considered normative or antinormative in society at large (1 = *normative,* 7 = *antinormative*).[4] Also, coders were asked to indicate whether, in the specific experimental procedure, they thought that the dependent variables measured normative or antinormative behavior: in other words, whether that behavior was acceptable to the situational norm or demand in the experimental context (1 = *normative,* 7 = *antinormative*). To answer this last question, coders were instructed to consider simultaneously the behavior under observation, the experimental context, and the participants. Thus, coders had to assess what the "normal" course of action would be for a participant in the specific context. The label *situational norm* is applied here because a context cue may not prescribe the desirable course of action, in itself, whereas a situational interpretation of those cues will, in fact, indicate the course of action. For example, Diener (1980) used the example of a gun as an aggressive social context cue. Although a gun in itself undoubtedly constitutes a symbol of aggression, the situational context of firing the gun needs to be known to determine whether use of the gun would be antinormative (e.g., in assaulting an innocent person: an undesirable course of action) or more normative (e.g., in defense of oneself or another: in extreme cases, a normative course of action). Reliabilities across three coders were fair for the general social norm (intraclass r = .52) and good for the situational norm (r = .65; see Orwin, 1994). The average across coders was computed and used in the analyses.[5]

Moderator variables were computed from the coders' judgments. These moderators were included because of their theoretical or methodological relevance, and they are elaborated subsequently. Broadly, two types of moderator variables can be distinguished: categorical and interval moderators. Table 1 gives an overview of each category and a description of each interval moderator, and it briefly summarizes predictions derived from classical and contemporary deindividuation theory. The exact operationalization of each coding category is elaborated for each moderator in turn.

Manipulation. Six types of deindividuation manipulation can be distinguished. Anonymity to the in-group exists when an individual's antinormative actions would be unidentifiable to other participants (i.e., one's own group), whereas the identifiability to others (e.g., the experimenter) is constant across conditions. Thus, what matters is not so much anonymity of the individual per se as the unidentifiability of antinormative actions the person takes. An example of such a manipulation would be a study in which participants were informed that their (antinormative) responses would be made public and discussed in the group or not made public and not discussed in the group (Lindskold & Finch, 1982); in fact, their answers were recorded in a uniform fashion across conditions. Anonymity to the out-group typically manipulates anonymity to the experimenter. Often, this is done by stressing that participants' individual responses are not of interest or cannot be identified versus emphasizing that these responses are of interest and can be identified. Also, participants are sometimes dressed in uniform clothing designed to make them unidentifiable to the experimenter or the victim in case of a shock administration paradigm. To be coded in this category, participants' responses had to be equally identifiable to each other, however.

Manipulations of group size are relatively straightforward manipulations of the size of experimental groups. For example, Diener, Lusk, DeFour, and Flax (1980) reported a study comparing individual participants with groups of sizes 2, 4, 8, and 16. Other studies included here were field studies observing the number of transgressions in groups of varying sizes (Diener et al., 1976; Erffmeyer, 1984; Jorgenson & Dukes, 1976; Maruyama, Fraser, & Miller, 1982). Manipulations of self-awareness can be divided into manipulations of private and public self-awareness. Private self-awareness is usually manipulated through seating participants in front of a mirror. Public self-awareness involves having participants monitored by a video camera or an audience.

The compound manipulations of deindividuation are manipulations of two or more of the just-mentioned factors used simultaneously. This combination of manipulations makes it difficult to assess which variable is responsible for possible effects. An example is Prentice-Dunn and Spivey's (1986) "extreme deindividuation" manipulation. This involved placing participants in a dark room so as to make them anonymous to both the in-group and the out-group. In addition, loud rock music was played, and the participants engaged in group-cohesiveness activities and watched exciting stimuli. Although procedures such as these might be high-impact manipulations of deindividuation, unfortunately they are ambiguous. The results from this category therefore have to be treated with caution. Despite these methodological reservations, such studies are often viewed as core evidence for deindividuation theory, and hence they were included in the analysis.

Dependent variable. By far the most often used dependent variable is the administration of electric shock or loud noise (Zimbardo, 1969). Such dependent variables are typically recorded in a (modified) Buss aggression machine in which the participant is asked to administer shocks to another participant (in reality a confederate). Other studies investigate behavioral or verbal disinhibition. Examples of behavioral disinhibition are simulations of physical aggression, such as in a paradigm in which participants are required to "distract" a nonresponsive target (the "beat the pacifist" paradigm; Diener, Westford, Dineen, & Fraser, 1973). Examples of verbal disinhibition are remarks about taboo topics made during group discussions, for example, discussions about sex (Diener & Kasprzyk, 1978; Singer et al., 1965). Amount of stealing or cheating is usually examined in field settings in which trick-or-treaters are given the opportunity to steal candy (e.g., Diener, Westford, Diener, & Beaman, 1973). Other designs provide participants with the opportunity to cheat on a psychological test and observe to what extent participants do so (e.g., Diener & Wallbom, 1976; Nadler, Goldberg, & Jaffe, 1982).

Another operationalization of antinormative behavior is the expression of undesirable attitudes (in contexts in which the "desirability" of expressing certain views is assumed to be self-evident). For instance, G. L. White and Zimbardo (1980) examined attitudes toward marijuana, and Mathes and Guest (1976) examined attitudes toward engaging in undesirable and embarrassing behavior. Three studies examined the failure to act prosocially, for example, in a bystander intervention paradigm (Becker-Haven & Lindskold, 1978). One study could not be categorized in this coding scheme: Singer et al. (1965) examined degree of confor-

[4] More specifically, coders were instructed to consider the antinormative pole of each dependent variable, for instance, frequently administering electric shocks (vs. the normative pole [not frequently]). The behavior they rated in terms of normativity was this antinormative pole.

[5] In addition to the general and situational norms, the coders rated the extent to which dependent measures were assessing aggression. Because the intercorrelation between the estimated general social norm and the aggressiveness score of dependent measures was very high (r = .77), it was decided to discard the aggressiveness scores and focus on the situational and general social norm scores. The general social norm and the situational norm were uncorrelated (r = .06), indicating that the situational norms were not generally in line with what would be expected in society in general.

Table 1
Potential Moderator Variables and Predictions for Deindividuation Effects

Moderator	Category or scale	Deindividuation theory predictions[a]	
		Classical	Contemporary
Manipulation	1: Anonymity to the in-group	+	0
	2: Anonymity to the out-group	+	0
	3: Compound deindividuation	+	+
	4: Group size	+	+
	5: Private self-awareness	+	+
	6: Public self-awareness	+	0
Dependent variable	1: Administration of shocks or noise	+	+
	2: Verbal and behavioral disinhibition	+	+
	3: Stealing and cheating	+	+
	4: Expressing antinormative attitudes	+	+
	5: Failing to act prosocially	+	+
Participant population	1: Students		
	2: Children		
	3: Other		
Participants in groups	1: Yes	+	+
	2: No	0	0
Group size	Average number of participants per group	+	+
Participant's gender	Percentage of male participants		
Duration of manipulation	Duration of manipulation in minutes		+
General social norm	Degree to which dependent variable measures socially antinormative behavior	+	+
Situational norm	Degree to which dependent variable measures contextually antinormative behavior	+	+

[a] The direction of the effect of deindividuation manipulations on antinormative behavior is predicted: + indicates a positive effect size, 0 indicates no relation, and a blank cell indicates that no predictions are made. For interval moderators, the strength of the moderator–effect size relation is predicted: + indicates a positive relation, 0 indicates no relation, and a blank cell indicates no predictions.

mity as a measure of undesirable behavior in the Asch (1952) conformity paradigm.

Participant population. This category differentiated between the samples used in the studies. Student samples were most common. Especially the field studies examining trick-or-treating made use of children. Finally, a few studies used "other adults" as their sample.

Participants in groups. This category recorded whether people participated in groups or not. According to some, because deindividuation is essentially a group phenomenon, studies examining deindividuation in individuals do not test the deindividuation hypothesis adequately. For example, Zimbardo (1969) claimed that anonymity manipulations would increase self-awareness when participants were alone.

Group size. As explained earlier, group size is theoretically one of the variables that should cause deindividuation. Larger groups are hypothesized to have a deindividuating effect on their members. Average group size was included as a continuous moderator variable to allow examination of the relation between group size and effect size. Although this moderator is similar to the categorical moderator participants in groups, the group size variable is at the interval level and thus allows a more accurate assessment of the relationship between group size and effect size.

Participants' sex. Sex was investigated systematically in a few studies (Diener, 1979; Diener et al., 1976; Diener, Westford, Dineen, & Fraser, 1973; Jorgenson & Dukes, 1976; Rehm, Steinleitner, & Lilli, 1987) but never with an explicit hypothesis as to possible male–female differences. Yet, the first study investigating deindividuation quasi-experimentally (Festinger et al., 1952) reported, in a footnote, that eight female groups had to be dropped from the analysis. Likewise, a replication of this study by Cannavale, Scarr, and Pepitone (1970) demonstrated that male and female groups responded differently; deindividuation results were obtained only in the all-male groups. This finding corresponds to Diener, Westford, Dineen, and Fraser (1973), who found greater disinhibition in males. Thus, empirical evidence indicates that males may be more prone to behavioral disinhibition under deindividuating circumstances. Reviews of gender differences in aggression also have reported that males in general are more aggressive than females, especially in the laboratory settings of the Buss (1961) aggression machine (Eagly, 1987; Eagly & Steffen, 1986); it is not clear, however, whether this difference interacts with deindividuating manipulations. We investigated whether sex of the participant population could account for variance in the effects of deindividuating manipulations.

Duration of manipulation. According to Prentice-Dunn and Spivey (1986), more prolonged deindividuation manipulations should produce more extreme antinormative behavior, and their study showed support for their contention. Thus, the duration of the manipulation was assessed for those studies providing this information. For most studies, this was simply the duration of the experimental situation, because situational manipulations were used.

General social norm. Studies were designed to measure dependent variables considered antinormative in society at large. However, it is also possible that some of the dependent measures were less "antinormative" than others. If a measure of antinormative behavior should somehow fail to tap genuinely antinormative behavior, based on deindividuation theory, one would not expect consistent effects of deindividuating manipulations on that dependent variable. More specifically, the degree to which, say, administering shocks is antinormative differs from the

degree to which not returning one's tray in a canteen is antinormative, the latter being less hostile and aggressive. Such variations could account for variations in effect sizes. On this measure, a higher score indicates that the dependent variable was more antinormative. Both classical and contemporary deindividuation theory predict that deindividuated participants will display anti-normative behavior. They would therefore predict that studies more adequately measuring anti-normative behavior (receiving higher antinormative scores) would show the greatest effect of deindividuation manipulations, and studies less adequately measuring anti-normative behavior (receiving lower scores) would show smaller effects. On the basis of deindividuation theory, then, a positive correlation between general social norm rating and effect size would be predicted.[6]

Situational norm. It has been suggested that general social norms are not necessarily relevant to the participants in an experiment or field setting (Lindskold & Propst, 1980; Reicher et al., 1995), because norms are mostly situation specific. Indeed, one could argue that it is difficult to specify what general social norms are; they may be less stable than is often assumed. A good example concerns aggression. Aggression would usually be deemed antinormative; in self-defense or defense of another, however, it can be positively valued and deemed appropriate. Similarly, in the context of an experiment, it is possible that to shock another participant is highly antinormative when no good reason is provided for the administration of shocks but is much more acceptable when such treatments are embedded in an elaborate cover story explaining to participants why it is appropriate to administer shocks. The situational norm estimate was designed to take into account such situational variance of the degree of normativity of participants' behavior in a specific context. The estimate was given such that lower scores indicate that a certain behavior would be normative in an experimental context, higher scores indicating that behavior would be antinormative. Because deindividuation theory predicts norm transgression as a result of deindividuating circumstances, a positive correlation between the situational norm and effect sizes would indicate support for the theory, antinormative behavior being highest in the studies measuring behavior that is antinormative according to situational norms. Other theoretical frameworks, especially the SIDE model, suggest the opposite: Deindividuating conditions such as group immersion and anonymity should increase group salience and enhance the influence of situational norms.

Statistical Methods

The choice of a meta-analytic method (e.g., Cooper & Hedges, 1994; Rosenthal, 1991) to integrate results was based on several considerations. Principally, a meta-analysis can be used to assess the strength of a relation between an independent variable and a dependent variable. Each independent observation of such a relation (i.e., each empirical study) can be used to assess the strength of the manipulation (e.g., group size) on the dependent variable (e.g., the intensity of electric shocks). In the example, the effect of anonymity on the intensity of the shocks could be reported as an F or a t statistic. These statistics and their degrees of freedom can be converted into an effect size index. The present analysis used as its effect size the correlation coefficient (r). As the correlation coefficient becomes larger, the effect of anonymity on the intensity of shocks increases. Cohen (1977) stated that effect sizes of .1 are small, effect sizes of .3 are medium, and effect sizes of .5 are large. The effect sizes of various studies can be combined to assess the magnitude of effects in the literature.

A meta-analysis further allows one to examine whether variations in effect sizes across studies can be accounted for by characteristics of the studies. Previous reviewers (Diener, 1977; Dipboye, 1977) stressed the variability of deindividuation outcomes in the literature. Thus, the possibility of systematically examining moderators accounting for variations in results is a second reason to conduct a meta-analysis. A final consideration is the large number of independent empirical tests examining the deindividuation hypothesis. A traditional review would have difficulty summarizing the results of so many studies.

Recommendations by Rosenthal (1991) and Cooper and Hedges (1994) were followed for a fixed effects model analysis (the choice of a fixed effects approach was based on the limited variety of paradigms found; Cooper & Hedges, 1994; Shadish & Haddock, 1994). Weighted averages of effect sizes were computed via the Fisher transformation of the correlation coefficient (Z_r); sample sizes were used as weights. If the report of the study provided insufficient information, effect sizes had to be estimated from the data. In cases in which the information provided was only that a certain effect was "not significant" or that "$F < 1$," an effect size of zero was assumed. If information was given only about the level of significance (e.g., $p < .05$ or $p = .02$), the effect size was computed conservatively such that the largest significance level was converted into a Z score. Such estimates of effect sizes were necessary for a small number of the estimates made (only $k = 8$ studies of the total $K = 70$ estimates). For some studies ($k = 13$), effect sizes could be computed from the data provided, usually by reconstructing unreported standard deviation estimates or by comparing specific levels of a factor. The remaining 49 effect size estimates were drawn directly from the reported test statistics. Each study was treated as an independent data point. When studies reported more than one relevant dependent variable (e.g., duration, frequency, and intensity of administering electric shocks), these variables were pooled to one average r value for the study.[7] Effect sizes of studies investigating more than one independent variable of interest ($k = 10$) were likewise pooled, although not when each manipulation's effects were examined separately.

Mean effect sizes were computed, both sample size weighted and unweighted. Reliability of the mean effect sizes was established with Stouffer's Z (Becker, 1994; Rosenthal, 1991). Reliability was computed on the sample-size-weighted effect sizes. Variation in effect sizes was examined with the index of within-group variance or homogeneity (Q_w; Hedges, 1994). Effects of the moderator variables were examined differently for categorical and continuous moderators. The categorical moderators were examined by performing analyses of variance, yielding estimates of between-groups variance (Q_b). Effects of interval moderators (e.g., proportion of male participants) were established by regressing the moderator variables on the Fisher-transformed effect size (Z_r). The standardized regression weight (β) is an index of the strength of the association between the two (Hedges, 1994). All tests involved a significance level of $\alpha = .01$; even with this conservative criterion, however, it is important to stress that results of a meta-analysis should be very compelling before they can be regarded as definitive (Begg, 1994, p. 408).

Results

In total, 60 independent studies met the criteria for inclusion. Seventy effect size estimates were computed from these studies; 10 studies included two manipulations of interest, and hence two effect sizes were estimated from these studies, one for each

[6] An alternative possibility, suggested by a reviewer, is that moderately antinormative dependent variables are more likely to show increases than either extremely antinormative or normative dependent variables. This possibility is examined later.

[7] Some meta-analyses prefer to include each dependent measure as a separate measurement point. However, we decided to analyze each study as an independent observation and, hence, pool different observations made within one sample.

Table 2
Tests of Study Effect Sizes for All Studies Combined and Subdivisions by Categorical Moderator Variables

Summary variable and source	Between-classes effect		Central tendency						Homogeneity within classes	
	Q_b	df	r_w	95% confidence interval[a]	K	N	Fail safe N	Z	SD	Q_w
Manipulation	18.16*	5								
Anonymity to in-group			.03	−.11 to .17	15	923	−12	0.71	0.25	43.28**
Anonymity to out-group			.16	−.01 to .34	11	923	43	3.65**	0.26	22.03
Group size			.11	−.12 to .34	11	1,880	69	4.42**	0.34	130.66**
Private self-awareness			.01	−.18 to .20	12	638	−10	0.62	0.30	41.01**
Public self-awareness			.16	−.06 to .38	8	416	14	2.70*	0.26	13.62
Compound deindividuation			.18	.04 to .31	13	679	82	4.45**	0.23	28.80**
Dependent variable	48.82**	4								
Shocks or noise			$.05_a$	−.06 to .15	23	1,284	−16	0.89	0.25	53.58**
Disinhibition			$.09_{ab}$	−.04 to .22	14	756	31	2.96*	0.22	28.86*
Stealing and cheating			$.25_b$	.11 to .39	7	1,127	124	7.13**	0.15	6.18
Antinormative attitudes			$.08_a$	−.07 to .22	12	888	13	2.40*	0.23	39.60**
Failing to act prosocially			$-.07_a$	−.88 to .74	3	606	−2	1.04	0.33	31.93**
Participant population	47.16**	2								
Students			$.09_a$	.02 to .15	50	2,886	274	4.19**	0.23	117.19**
Children			$.23_b$	−.06 to .51	6	1,057	86	6.45**	0.27	33.12**
Other			$-.09_a$	−.44 to .25	4	772	0	−1.74	0.22	20.78**
Participants in groups	11.94**	1								
Groups			$.12_a$	.05 to .20	37	3,482	571	6.67**	0.23	150.50**
Individuals			$.00_b$	−.11 to .12	22	1,127	−21	0.34	0.26	54.50**
Overall			.09	.03 to .15	60	4,715	590	5.41**	0.24	218.25**

Note. Means in the same column within one category that do not share subscripts differ at $p < .01$ by post hoc comparisons based on generalizations of the Scheffé method (Hedges, 1994). Q_b = between-groups heterogeneity; r_w = weighted effect size (correlation coefficient); K = number of studies; N = total number of participants; fail safe N = number of null effects to reduce r_w to zero; Q_w = within-group heterogeneity.
[a] Unlike other computations, the 95% confidence interval was computed with the random-effects approach.
* $p < .01$. ** $p < .001$.

manipulation.[8] Of the studies eventually included in the analysis, 5 were conducted before 1970, 26 were conducted in the 1970s, 23 were conducted in the 1980s, and 6 were conducted in the 1990s. Thus, it appears that since the last reviews were conducted, much new evidence has been gathered examining the deindividuation hypothesis. The Appendix provides an overview of the descriptive statistics of each effect size estimate.

Central Tendency and Homogeneity

Results of the meta-analysis with regard to the aggregated effect sizes are summarized in Table 2. As can be seen in the bottom row, overall there was minimal support for the deindividuation hypothesis. In a total of 60 studies with 4,714 participants, the average effect of deindividuation manipulations on antinormative behavior was small but statistically reliable (r = .09, r_w = .09, Z = 5.41, $p < .001$). The fail safe number confirmed that the effect was not likely to be caused by unpublished studies in file drawers. To reduce the effect to nonsignificance, an additional 590 studies with null effects would have to be discovered, an unlikely event.

Figure 1 displays a scatterplot of effect sizes (x-axis) by the number of participants per study (logarithmic y-axis). Such a scatterplot would typically be funnel shaped around the mean effect size. As can be seen in Figure 1, however, the effect sizes are scattered across the graph, with no clear tendency emerging in the studies with larger samples. Effect sizes tended to range from negative to positive, with few strong effects and with a majority of effect sizes on the positive end of the scale. Thus, examination of the effect sizes suggests that variability was high and confirms that, overall, the deindividuation hypothesis was supported, albeit by a small effect. As can be seen on the right-hand side of Table 2, the index of heterogeneity confirms that the overall variability was high, SD = 0.24, Q_w = 218.25, K = 60, $p < .001$, with effect sizes (rs) ranging from −.49 to .56.

Categorical Moderators

The central tendencies for subsamples based on the categorical moderators were compared in a number of analyses of variance. When studies were divided according to the manipulations applied (K = 70, studies with multiple manipulations being analyzed separately), the average effect size (r_w) varied from .01 (Z = 0.62, ns) to .18 (Z = 4.45, $p < .001$). These moderate differences were reliable, $Q_b(5)$ = 18.16, $p < .01$, but left a

[8] The effect size estimates for studies with multiple manipulations were pooled for the computation of overall effect sizes and for the computation of effects of categorical moderators other than the manipulation.

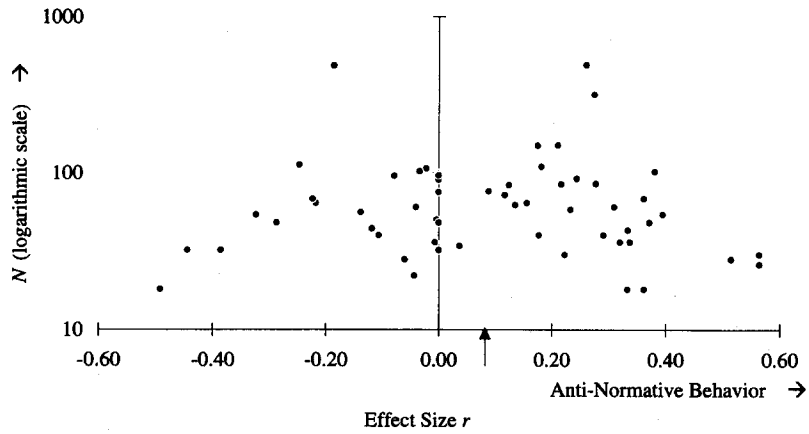

Figure 1. Funnel graph of effect sizes plotted by number of participants on a logarithmic scale.

large portion of variance unaccounted for, $Q_w(64) = 279.39$, $p < .001$. The support for the deindividuation hypothesis was not reliable in studies manipulating anonymity to the in-group ($K = 15$) and private self-awareness ($K = 12$). The lack of significant effects for the private self-awareness manipulations was especially remarkable; manipulations of this psychological state should foster antinormative behavior according to contemporary deindividuation theory.

Small but reliable effects were found with manipulations of anonymity to the out-group ($K = 11$), public self-awareness ($K = 8$), group size ($K = 11$), and compound manipulations ($K = 13$). Although one cannot single out causes for the effect in the case of compound manipulations, the other effects suggest that reduced accountability leads to antinormative behavior. This is more in line with the proposal of classical deindividuation theory (e.g., Diener, 1980; Zimbardo, 1969) that anonymity to outsiders will lower consciousness of social restraints (i.e., public self-awareness, Prentice-Dunn and Rogers's second route to disinhibited behavior). This is supported by an examination of the remaining within-group variances. For all manipulations, considerable variation remained, except for anonymity to the out-group ($Q_w = 22.03$, *ns*) and public self-awareness ($Q_w = 13.62$, *ns*). Indeed, the difference between private self-awareness and public self-awareness was highly reliable, $Q_b(1) = 95.08$, $p < .001$, indicating that reduced public self-awareness is a better predictor of deindividuated behavior. In sum, although there were variations in average effect size between studies using different manipulations, the individual analyses confirmed the existence of a small positive relation between deindividuation manipulations and antinormative behavior or showed no effect at all.

Results from subsamples with similar dependent variables likewise deviated from each other, $Q_b(4) = 48.82$, $p < .001$, although the variance within cells remained substantial, $Q_w(53) = 160.14$, $p < .001$. The average effect sizes (r_ws) within groups ranged from $-.07$ ($Z = 1.04$, *ns*) to .25 ($Z = 7.13$, $p < .001$) for the studies with stealing and cheating as dependent variables. The focused comparison between these studies and the other dependent variables (all r_ws $< .10$) was highly reliable, $Q_b(1) = 38.04$, $p < .001$. These supportive effects of stealing and cheating were obtained mainly in field studies (Diener et al., 1976; Diener, Westford, Diener, & Beaman, 1973; Erffmeyer, 1984; F. G. Miller & Rowold, 1979), three of which involved children as participants. However, because the effects in this category were homogeneous, $Q_w(6) = 6.18$, *ns*, it cannot be said that either field studies or child participants alone were responsible for this effect.

When dividing studies by participant population, studies with children showed most support for the deindividuation hypothesis, $r = .23$, $Z = 6.45$, $p < .001$. The studies with university students showed a small average effect, $r = .09$, $Z = 4.19$, $p < .001$, but studies with other adults as participants showed no relation between deindividuating manipulations and antinormative behavior, $r = -.09$, $Z = 1.74$, *ns*. Although the overall differences were significant, $Q_b(2) = 47.16$, $p < .001$, the focused comparison between students and other adults was not reliable, $Q_b(1) = 5.38$, *ns*. The difference between adults (students and others) and children, however, was highly reliable, $Q_b(1) = 27.40$, $p < .001$. On closer examination, it appears that the support for deindividuation theory found in the child samples can be attributed to those studies ($k = 3$) with stealing and cheating as dependent variables; when these studies are removed, the remaining effect is small and not reliable, $r = .06$, $Z = 1.96$, *ns*.

When participants were analyzed in groups ($k = 37$), the average effect size was not very different from the overall effect size ($r = .12$, $Z = 6.67$, $p < .001$), although it was larger than in those studies ($k = 22$) examining deindividuation in individuals ($r = .00$, $Z = 0.34$, *ns*), $Q_b(1) = 11.94$, $p < .001$. This finding confirms the assumption that antinormative behavior is more likely to occur in groups. Nevertheless, variance remained quite substantial within these two categories.

Interval Moderators

The interval moderator variables were used to conduct regression analyses in an attempt to account for the considerable variance in effect sizes. The results of these regressions are presented in Table 3. The left-hand side of this table displays the results of simple regression analyses, and the right-hand side

Table 3
Simple and Multiple Regressions of Interval Moderators on Effect Sizes

	Simple regression						Multiple regression					
Source	*B*	*SE*	β	*Z*	*k*	R^2	*B*	*SE*	β	*Z*	*k*	R^2
Group size	0.02	0.01	.21	3.14**	59	.05	0.03	0.01	.21	1.57		
Participants' gender	0.05	0.09	.11	1.45	51	.01	0.07	0.05	.07	0.52		
Duration of manipulation	0.00	0.00	−.03	0.20	27	.00	0.00	0.00	−.23	1.70		
General social norm	−0.01	0.04	−.05	0.80	60	.00	−0.02	0.02	−.02	0.18		
Situational norm	−0.17	0.03	−.40	5.90**	60	.16	−0.10	0.02	−.72	5.22**		
Total											27	.50

** $p < .001$.

displays the results of the multiple regression with all variables entered simultaneously. With regard to group size, deindividuation theory would predict that deindividuation, as a psychological state, is more likely to occur in larger groups than in smaller groups or individuals. Hence, the effect sizes of large groups should be greater than those of small groups. This prediction was partially confirmed, with group size loading positively on effect sizes in the simple regression ($\beta = .21$, $SE = 0.014$, $K = 59$, $Z = 3.14$, $p < .001$). In the multiple regression, however, the size of the effect was the same but was no longer reliable ($\beta = .21$, $SE = 0.009$, $K = 27$, $Z = 1.57$, *ns*).

The expectation that participants' sex could explain variation in effect sizes was not substantiated either in the simple regression ($\beta = .11$, $K = 51$, $Z = 1.45$, *ns*) or in the multiple regression ($\beta = .07$, $K = 27$, $Z = 0.52$, *ns*). Likewise, the duration of the manipulation had no explanatory value. It was not the case that prolonged manipulations induced stronger antinormative behavior. In fact, there was a small, nonsignificant tendency for the opposite effect in the simple regression ($\beta = -.03$, $K = 27$, $Z = 0.20$, *ns*). In the multiple regression, this tendency was stronger, suggesting that when differences due to other moderators are partialed out, longer durations predict less anti-normative behavior ($\beta = -.23$, $K = 27$, $Z = 1.70$, *ns*).

At the heart of deindividuation theory is the assumption that deindividuating circumstances cause behavior antinormative to society at large. The regressions with the general social norm did not confirm this prediction. The general social norm, as rated, did not reliably account for variance of effect sizes ($\beta = -.05$, $K = 60$, $Z = 0.80$, *ns*). Likewise, the multiple regression showed no sign that variations in social norms account for any variance in effect sizes ($\beta = -.02$, $K = 27$, $Z = 0.18$, *ns*). Alternatively, one might hypothesize that those studies measuring extremely anti-normative behavior would be ill equipped to tap into the moderate levels of deindividuation that can be achieved in the laboratory. This reasoning would suggest a curvilinear relationship between the general social norm and effect sizes such that the most support for the deindividuation theory would be found with moderately antinormative dependent variables and the least support would be found with more extreme normative or antinormative dependent variables. A regression with the transformed social norm scores did not reveal any such quadratic relation, however ($\beta = .03$, $K = 60$, $Z = 0.45$, *ns*). Thus, the assumption that deindividuating manipulations cause deviation from general social norms can be questioned even when one takes into account the differences between studies in the degree to which antinormative behavior was operationalized.

Regressions with the situational norm, however, showed a marked and reliable effect across all regression analyses (simple regression: $\beta = -.40$, $K = 60$, $Z = 5.90$, $p < .001$; multiple regression: $\beta = -.72$, $K = 60$, $Z = 5.22$, $p < .001$). Largely as a result of this reliable relation, the multiple regression analysis accounted for a considerable proportion of variance in effect sizes ($R^2 = .50$). The direction of this effect was opposite to predictions of deindividuation theory; deindividuated participants behaved more in accordance with the situational norm rather than less.

Multivariate Analysis of Continuous and Categorical Moderator Variables

A multiple regression analysis was conducted to assess the joint effects of interval moderators and categorical moderators. The number of independent tests ($K = 60$) limited the number of predictor variables that could be examined for a stable regression solution. To obtain an acceptable number of predictors, we used only the univariately reliable moderators as predictors. Moreover, the categories involving an unacceptably low number of studies ($k < 8$) were merged to form single categories. As well as reducing the number of dummy variables, this reduced the disproportionate impact outliers might have had in small groups, leading to a more robust solution. Finally, the categorical moderator participants in groups was dropped altogether because of its overlap with the continuous moderator group size. The multiple regression retained the situational norm and group size moderators (both reliable continuous variables) and the dummy coded manipulation (with the exception of public self-awareness [$k = 3$] and group size [$k = 6$])[9] and dependent variable (with the exception of stealing and cheating [$k = 7$] and failing to act pro-socially [$k = 3$]). The participant population variable, although a reliable moderator, was dropped altogether because of the skewed distribution of children ($k = 6$) and other participants ($k = 4$).

[9] Note that the number of studies (k) deviates from that in Table 2; as mentioned in the Method section, single studies with two manipulations were merged to ensure independence of cases.

The solution confirmed earlier analyses, with one minor change (Table 4). In comparison with the simple regression with the situational norm as predictor ($R^2 = .16$), the multivariate regression explained more variance: $R^2 = .29$, a reliable increase, $Q_{change}(8, k = 58) = 8.00, p < .001$. The situational norm was the best predictor ($\beta = -.61, Z = 6.03, p < .001$), and group size was a reliable predictor with an effect comparable to the simple regression ($\beta = .24, Z = 3.07, p < .01$). All but one of the dummy coded variables were unreliable predictors. The dummy coded comparison of studies with antinormative attitudes as the dependent measure (coded as 1) and other studies (coded as 0) was reliable ($\beta = .26, Z = 2.78, p < .01$). This effect indicates that studies with attitudes as dependent measures showed stronger support for deindividuation theory than other studies when controlled for the other moderators. Because the average effect size of studies with attitudes as dependent measures ($r_w = .07$) was not greater than the average of other studies combined ($r_w = .09$), it appeared that this significant regression coefficient was due to controlling for the other predictors. Indeed, the studies with attitudes as the dependent measure were rated as less situationally normative, and groups were somewhat smaller than in the other studies, which accounted for the effect.[10] In sum, the multivariate analysis confirmed the earlier results, establishing that the situational norm has strong predictive power.

Measures of the Deindividuated State

Only a small number of studies actually measured the mediating constructs of self-awareness, private self-awareness, and deindividuation. None of these studies reported a full mediational analysis or path model, as is required to infer actual mediation (R. M. Baron & Kenny, 1986). Yet, enough details were provided in 7 of 12 studies to compute the regression weights required for such a mediational analysis, and these results are shown in Table 5. When aggregating across studies (the bottom row of Table 4), we found no evidence that the measured constructs mediated. The association between the manipulations and antinormative behavior was small and reliable ($\beta = .13, K = 7, Z = 2.81, p < .01$). When the influence of the mediating construct was partialed out, this effect was not reduced, however, as would be required to infer mediation ($\beta = .12, Z = 2.65, p < .01$). Moreover, the association between the mediator and antinormative behavior was quite small ($\beta = -.08, Z = 1.58, ns$).

On the basis of contemporary deindividuation theory, however, reduced private self-awareness is the appropriate measure of a deindividuated state (Prentice-Dunn & Rogers, 1982, 1989). Yet, an analysis of variance with the different types of potential mediators (self-awareness, private self-awareness, and public self-awareness) as categories did not reveal any reliable differences between them in the relationships among the mediator, independent, and dependent variables. Apparently, self-awareness and related constructs do not mediate the effect of deindividuation manipulations on antinormative behavior.

Table 4
Multiple Regression of Reliable Moderators on Effect Sizes

Source	B	SE	β	Z	k	R^2
Situational norm	−0.16	0.03	−.61	6.03**		
Group size	0.03	0.01	.24	3.07*		
Manipulation 2	−0.08	0.05	−.13	1.61		
Manipulation 3	0.02	0.06	.03	0.32		
Manipulation 4	0.07	0.06	.10	1.19		
Manipulation 5	0.00	0.06	.00	0.05		
Dependent variable 2	0.14	0.06	.28	2.37		
Dependent variable 3	0.14	0.06	.23	2.31		
Dependent variable 4	0.16	0.06	.26	2.78*		
Total					58	.29

Note. Categorical moderators were dummy coded as follows. Manipulation 2: anonymity to in-group = 1, other = 0; Manipulation 3: anonymity to out-group = 1, other = 0; Manipulation 4: private self-awareness = 1, other = 0; Manipulation 5: compound deindividuation = 1, other = 0; Dependent variable 2: shocks or noise = 1, other = 0; Dependent variable 3: disinhibition = 1, other = 0; Dependent variable 4: antinormative attitudes = 1, other = 0.
$^*p < .01$. $^{**}p < .001$.

Discussion

Deindividuation theory proposes that input variables such as anonymity, large groups, and reduced self-awareness cause antinormative behavior. The meta-analysis did not show strong support for this hypothesis. In fact, some results supported conclusions opposite to deindividuation theory's predictions. Across 60 studies, there was a small effect of deindividuation manipulations on antinormative behavior, defined as transgression of general social norms. Moreover, these effects were highly variable. Thus, results on the whole do not warrant deindividuation theory's status as describing a robust group process.

Neither the heterogeneity of effects nor the lack of support for the different versions of deindividuation theory can be attributed to the use of different independent variables. Although effects varied across manipulations, the differences accounted for only a minor portion of the overall variance. Moreover, conclusions on the basis of isolated manipulations remained substantially the same, and the differences were not substantiated in the multivariate regression of all reliable moderators. Compound manipulations, manipulations of anonymity to the out-group, group size, and public self-awareness showed some support for the predicted relation, with small and statistically significant effects on antinormative behavior. However, only the manipulations of anonymity to the out-group and public self-

[10] Expressing unfavorable attitudes was slightly more situationally antinormative ($M = 3.94$) than were other dependent measures ($M = 3.57$). As a result of the negative correlation between situational norms and effect size, correcting for this difference (as the multivariate regression did) led to a higher estimated degree of antinormative behavior for attitude measures under deindividuating circumstances. Similarly, the group size in the studies measuring attitudes was smaller (M = 2.90) than in the other studies (M = 3.44). Because of the positive correlation between group size and effect size, correcting for this difference also boosted the estimated degree of antinormative behavior for attitudes under deindividuating circumstances.

Table 5
Strength of Associations Among Independent, Dependent, and Mediator Variables for Studies Measuring Self-Awareness or Related Constructs

		Strength of association									
		IV–DV		IV–Mediator		Mediator–DV		IV–DV[a]		Mediator–DV[a]	
Study	Mediator	*r*	*Z*	*r*	*Z*	*r*	*Z*	*β*	*Z*	*β*	*Z*
Becker-Haven & Lindskold, 1978	SA	.36	2.99*	.00	0.00	—	—	—	—	—	—
Carver, 1974	SA	−.38	−2.18	.00	0.00	—	—	—	—	—	—
Diener, 1976	SA	−.04	−0.31	.00	0.00	−.17	−1.32	−.04	−0.32	−.01	−0.05
Diener, 1979	SA	.22	1.99	.00	0.00	−.38	−3.48**	.25	2.33	.10	0.88
Diener & Kasprzyk, 1978	SA	.00	0.00	.00	0.00	−.10	−0.99	.00	0.00	.00	0.00
Diener et al., 1980, Study 1	SA	.00	0.00	−.24	−2.05	−.10	−0.87	−.02	−0.21	−.24	−2.07
Goldstein et al., 1981, Study 3	SA	.00	0.00	−.35	−1.96	—	—	—	—	—	—
Nadler et al., 1982	SA	.18	1.12	−.30	−1.89	—	—	—	—	—	—
Prentice-Dunn & Rogers, 1980	SA	.12	0.99	−.16	−1.36	−.20	−1.70	.09	0.75	−.14	−1.21
Prentice-Dunn & Rogers, 1982	Private SA	.33	2.19	−.21	−1.38	−.15	−0.98	.31	2.03	−.16	−1.08
Prentice-Dunn & Spivey, 1986, Study 2	Private SA	.24	2.33	−.27	−2.58*	—	—	—	—	—	—
Rogers & Prentice-Dunn, 1981	Public SA	.28	2.56*	−.12	−1.14	−.20	−1.84	.26	2.43*	−.07	−0.65
Average total (N = 12)		.11	3.37**	−.14	−3.57**						
Average subset (N = 7)		.13	2.81*	−.11	−2.24	−.19	−4.23**	.12	2.65*	−.08	−1.58

Note. Dashes indicate that data could not be obtained from the reports. IV = independent variable; DV = dependent variable; SA = self-awareness.
[a] Partial regression coefficients, identical to path coefficients.
* $p < .01$. ** $p < .001$.

awareness produced consistent (homogeneous) effects. Therefore, manipulations that had an impact on (feelings of) accountability had the most consistent effects on anti-normative behavior: When accountability was reduced, more antinormative behavior was displayed. Manipulations of private self-awareness and anonymity to the in-group had no overall effect on antinormative behavior. Thus, when one examines the relation between input variables and output behavior, there is limited but consistent support for classical deindividuation theory and no support for contemporary deindividuation theory.

Other moderators could potentially account for some of the variability. With regard to the dependent variables, stable effects were found in studies examining stealing and cheating. Effects in studies with children as participants were relatively strong as well, but this can be attributed to the subset of studies examining stealing and cheating. The reason that the strongest effects occurred for stealing and cheating may be that these are mild transgressions (such as in the context of trick-or-treating children) in comparison with the administration of electric shock. Indeed, stealing and cheating appeared to be relatively normative in comparison with other dependent variables, which would help to account for this effect.[11] However, alternative explanations for this finding cannot be entirely ruled out. One important characteristic of stealing and cheating is that they involve a material self-interest; other dependent measures are not clearly beneficial to oneself, but stealing and cheating can be rewarding assuming that one does not get caught. The effects on stealing and cheating were quite homogeneous: No differences were observed between studies examining stealing and cheating in the effects of different manipulations. It thus appears that deindividuating circumstances cause more stealing and cheating, possibly because of the individual rewards from such behavior or because it is seen as normative in these experimental situations (we return to a full discussion of the impact of situational norms shortly).

Another important finding is that the relation between input variables and antinormative behavior was indeed stronger in groups than in individuals, as predicted by deindividuation theory. This confirms the idea that transgression is facilitated by the presence of others and that deindividuation manipulations have smaller effects on individuals (Zimbardo, 1969). However, the size of this relation remains quite small, and effects are highly variable. Thus, even when focusing on studies in groups, there is inconsistent support for deindividuation theory.

The impact of group size was also substantiated by the regression analyses. There was a reliable impact of group size on effect size in the univariate analysis, and this was also the case in the multivariate regression of reliable moderators. Thus, in three variables related to group size (as an independent variable, as a study characteristic, and as a continuous index), we found

[11] A post hoc analysis confirmed that stealing and cheating were rated as situationally normative (M = 2.95) relative to other dependent variables (M = 4.07), $F(1, 57) = 15.79$, $MSE = 0.49$, $p < .001$. There was no difference for general social norms; stealing and cheating were equally antinormative (M = 5.54) relative to other dependent variables (M = 5.70), $F(1, 57) = 0.24$, $MSE = 0.16$, *ns*. An analysis of variance examined whether the differences between effects obtained with different classes of dependent variables could have been due to variations in the situational norm associated with these measures by using this norm as a covariate. Indeed, it appears to be the case that variations in situational norm can account for the differences obtained with this categorical moderator: The covariate effect was reliable, $Q(1) = 15.22$, $p < .001$, and the differences between various dependent measures were no longer significant, $Q_b(4) = 8.58$, *ns*.

evidence that larger groups either induce or facilitate stronger antinormative behavior. This supports the idea that deindividuation effects are essentially group phenomena, although the size of these effects is small.

Other continuous variables that could potentially account for some of the variation appear to have had little or no effect. Despite men's occasional greater aggression, the meta-analysis revealed no gender differences in responses to deindividuating settings. Men and women had an equal propensity to transgress in the face of deindividuating settings. Similarly, the duration of deindividuation manipulations was not related to the strength of deindividuation effects, unlike suggestions of contemporary deindividuation theory (Prentice-Dunn & Spivey, 1986). Thus, longer and shorter durations of manipulations produced equally strong effects. Finally, no variability could be explained with the degree to which dependent measures were antinormative according to general social norms. Deindividuation effects were equally strong regardless of whether behavior clearly violated general social norms or was more benign. None of these variables had a reliable impact in either the univariate or the multivariate regression analysis.

A very strong relation was found with the situational norm, however. Participants behaved more in accord with the situational norm under deindividuating conditions. This effect occurred regardless of the manipulation used in the study, and it was equally strong for all dependent variables. Classical deindividuation theory (Diener, 1976; Festinger et al., 1952; Zimbardo, 1969) hypothesizes that deindividuation decreases self-control and diminishes responsiveness to the situation. Our findings are inconsistent with this hypothesis and point to the opposite conclusion: Deindividuating circumstances induce increased responsiveness to the situation.

Contemporary deindividuation theory (Prentice-Dunn & Rogers, 1983, 1989; see also Diener, 1980) conceives of social context cues somewhat differently, such that deindividuation "results in decreased reliance on internal standards of appropriate conduct and increased attention to environmental cues for behavioral direction" (Prentice-Dunn & Rogers, 1983, p. 158). However, it is important to point out that although responsiveness to environmental cues was higher in the deindividuated participants, it seems that their conduct was guided by their evaluation and appraisal of these cues (specific social or situational norms as to appropriate conduct being much more than environmental cues). In this sense, behavior was regulated, and self-regulation did not decrease. If, for example, an experimenter provides a reason and justification to shock a confederate (so that such behavior is rated as relatively normative in the situation), deindividuated participants would seem to be more willing to administer severe shocks than when such justification is absent. This suggests that deindividuated participants make an evaluation as to the social desirability, correctness, or normativity of their actions. Indeed, this interpretation is supported by those few studies manipulating the normative context (Froming et al., 1982; Johnson & Downing, 1979; Reicher & Levine, 1994a, 1994b) in which deindividuation manipulations tend to elicit normative behavior. We therefore believe that this finding of increased attention to situational norms in deindividuated participants is generally inconsistent with the prediction of both classical and contemporary deindividuation theory of antinormative behavior and reduced self-evaluation.

The final step in evaluating hypotheses put forward by deindividuation theory is the analysis of the proposed mediation. As mentioned earlier, this analysis was complicated by inconsistencies in operationalizations and a lack of measurement of these variables. The failure of researchers to report these statistics may be due to the inherent difficulty in operationalizing deindividuation or self-awareness (Prentice-Dunn, 1991). Yet, on the basis of the research evidence, it must be concluded that neither predictions of classical deindividuation theory with regard to the mediating role of self-awareness nor predictions of contemporary deindividuation theory with respect to private self-awareness were supported. This is confirmed by the cases in which the mediating construct was manipulated directly. Here, too, the evidence for any relation between reduced private self-awareness and antinormative behavior was not forthcoming, and public self-awareness had only small effects.

Although the database provided insufficient studies to assess reliably the role of arousal in the group independently of other factors, this is perhaps less problematic given that arousal is predicted to have its effects by reducing (private) self-awareness (which was assessed). However, it is worth observing that some recent research has tended to question the proposal of contemporary theory that arousal will necessarily attenuate self-focus or self-awareness. Wood, Saltzberg, and Goldsamt (1990) found that negative mood increased self-focus, and research by Eisenberg et al. (1991, 1994) reported enhanced self-focus relating to personal distress under conditions of physiological arousal. Although the research by Wood et al. did suggest evidence of a weak reversal indicating external attentional focus for positive mood, negative affect may be the more relevant state, at least in aggressive crowds. Further primary research on affect and arousal within the group context is clearly desirable to resolve these apparent contradictions.

Implications for Deindividuation Theory

Overall, the results of the present analysis question the tenability of the main hypotheses derived from classical and contemporary deindividuation theory. There was some indication that manipulations of deindividuation lead to an increase in antinormative behavior, but this support was equivocal. In seeking to account for the variability of results, it appears that deindividuating conditions lead to an increase in normative behavior or, more specifically, to behavior that is normative within the social context. In this respect, the present results are incompatible with deindividuation theory: Deindividuating manipulations of anonymity, group size, and self-awareness foster adherence to situational norms and have comparatively little impact on behavior that is antinormative according to general social norms.

The lack of support for the mediating process is also detrimental to the classical and contemporary conceptualization of deindividuation. Across studies, there was no clear evidence that either self-awareness or private self-awareness causes antinormative behavior when manipulated directly or when measured as a mediating variable. At least in terms of the present database, it seems that self-awareness does not have a systematic effect on

antinormative behavior. The exception is public self-awareness, however. This variable had a small but consistent effect on antinormative behavior when manipulated directly; reduced public self-awareness was associated with more antinormative behavior. This concurs with the finding that anonymity to an outgroup leads to slightly more antinormative behavior. Thus, there is some support for the prediction from classical deindividuation theory (also predicted by Prentice-Dunn and Rogers's second route, as well as by a number of theoretical perspectives discussed subsequently) that reduced accountability plays a role in causing disinhibited and antinormative behavior.

These effects of public and private self-awareness raise the question of what deindividuation as a psychological state really is and whether it exists as an independent process. As a means of pursuing the latter issue, in later versions of the theory (Diener, 1980; Prentice-Dunn & Rogers, 1982, 1989) the deindividuated state was largely equated with a decrease in (private) self-awareness. The issue is what distinguishes deindividuation from self-awareness (Diener, 1979). If deindividuation and reduced self-awareness are one and the same, it appears that reduced self-awareness is the more parsimonious description of the phenomenon.

There were exceptions in which subsamples of studies showed some support for hypotheses derived from deindividuation theory. First, studies examining groups revealed stronger deindividuation effects. Although it is unknown whether this effect was due to deindividuation (or to reduced accountability, for example), this finding suggests that the expression of antinormative behavior is associated with the presence of others. It should be noted, however, that without any indication of the mediating process, this finding provides no strong support for deindividuation theory, especially because other theories could equally explain the effect. Second, when the dependent measure was stealing or cheating, deindividuation effects were stronger and more robust. Deindividuation theory, in either its classical or contemporary form, does not adequately explain this difference. It is possible that this effect may have occurred because stealing and cheating are relatively normative in comparison with other deindividuated behaviors (for instance, in the case of Halloween trick-or-treaters) and have a component of self-interest. In sum, despite some exceptions, the evidence for deindividuation theory is inconclusive.

Alternative Explanations

In the search for a parsimonious explanation of these findings, two objectives seem important. The first is to find a theory that accounts for the experimental results, and the second is to find a theory that accounts adequately for behavior in the crowd (and, ideally, both). To facilitate a consideration of possible theoretical alternatives, it is useful to briefly summarize the main findings. The most striking result was that the deindividuation conditions of anonymity, larger groups, and reductions in self-awareness fostered adherence to situational norms. Thus, the factors that social psychologists have identified as playing a crucial role in the formation of collective behavior appeared to lead to a specific form of social regulation rather than its breakdown. This finding matches historical analyses of collective behavior that have stressed the crowd's order, restraint, and organization rather than its disorder and irrationality (Reicher, 1987; Reicher et al., 1995; R. H. Turner & Killian, 1972). The finding also fits with what is known in social psychology about the power of the group to elicit conformity to its norms from its members (e.g., Deutsch & Gerard, 1955; Sherif, 1936; J. C. Turner, 1991). Thus, manipulations of deindividuation would appear to cause a greater reliance on situational norms. We now consider in more detail (alternative) theoretical explanations for this finding.

The observation that deindividuating factors enhance responsiveness to situational context suggests that normative factors play a role. Such a conception of situational norms differs from traditional sociological perspectives on broader societal norms embedded in custom, law, and tradition. Rather, norms in this sense are similar to Sherif's (1936) analysis of situational norms, which emerge partly through the process of group formation. An analysis of situationally emergent norms would not only account for the experimental results but concur with influential theories of crowd behavior (e.g., R. H. Turner & Killian, 1972). A range of theoretical perspectives on collective behavior provide explanations echoing such a concern for normative factors, including behavioral contagion theory, emergent norm theory, impression management theory, and social identity theory. We consider these theories briefly in turn.

Behavioral contagion was advanced by Wheeler (1966) as an alternative explanation for anti-normative behavior. According to Wheeler, if a person suppresses a tendency toward certain behavior, an approach–avoidance conflict results. The conflict can be resolved if the person's restraints against the behavior are reduced. A reduction of restraints occurs when fear of (social) reprisals is undermined (e.g., by viewing a model performing the behavior). In contrast, impression management theory (Lindskold & Propst, 1980) proposes that people are mainly concerned with their self-presentation. They display socially desirable behavior when they are identifiable and lose restraints only when anonymous. Both of these theories could explain some of the findings of the meta-analytic integration, especially the finding that reduced accountability increases antinormative behavior. However, these theories do not predict the finding that anonymous people become more socially restrained, and not less so (abiding by situational norms).

R. H. Turner and Killian's (1972) emergent norm theory offers a more sociological explanation for crowd behavior. In their view, a crowd is an unstructured, heterogeneous, normless assembly of people. In the course of a collective event, this incoherent mass generates its own norms for behavior. These emergent norms may be considered antinormative to some other group, but the crowd itself conforms to these norms, partly because of identifiability within the crowd. This explanation is primarily geared to understanding collective behavior, but its implication for our meta-analytic results is that a normless context would strengthen adherence to situational norms. Although this partly converges with the findings, the theory fails to account for the role of deindividuating factors in these experi-

ments; why these factors would increase normative behavior is not clear. For example, anonymity within the group strengthens the influence of situational norms. On the basis of emergent norm theory, however, one would expect that identifiability is necessary for those norms to be most effective.

Another perspective was offered by Ziller (1964), who focused on the conflict experienced by individuals between the need for individuation and individual identity and the need for deindividuation by submersion in and identification with the group. Thus, Ziller defined deindividuation as a closer adherence to one's group or environment. This is similar to the point made by Diener (1980), who suggested that a deindividuated person feels part of a group "conceived as a whole." Although Ziller did not specify the factors leading to individuation, his argument that deindividuation would cause closer adherence to the social environment is supported by our results. However, this theory is not specific enough to fully account for the range of results obtained here.

The SIDE model (Reicher, 1984, 1987; Reicher et al., 1995; Spears & Lea, 1992, 1994) argues a point similar to that of Ziller (1964). According to this model, deindividuating settings do not lead to a loss of personal identity; rather, they can facilitate a transition from a personal to a more social or collective identity. The so-called "antinormative" behavior found in the crowd, according to deindividuation theory, is actually a display of what is normative within the crowd according to this perspective (Reicher, 1984, 1987). Implicit in this analysis is the distinction between general social norms and situational or group-specific norms. When a person is "deindividuated" (i.e., less accountable or less aware of the personal self), it is the group's norms that are important, more so than general social norms. Of course, what is normative to the crowd might be contrary to what is normative outside of the crowd. To the outsider, then, crowd behavior might seem mindless, antinormative, and disinhibited; to the crowd, however, it is rational and normative and has its limits (Reicher, 1987).

Like classical deindividuation theory, the SIDE model argues that deindividuation manipulations (such as anonymity in the group) can have the effect of decreasing attention to individual characteristics and interpersonal differences within the group (Postmes, 1997). In addition (and in contrast to classical deindividuation theory), attention is devoted to contextual factors that provide cues as to the desirable course of action. Deindividuation manipulations thus increase the responsiveness to situational norms deriving from local demands and group identity (the known properties of the group, such as self-stereotypes and norms that are embedded within the self-concept). Thus, "deindividuation" is not necessarily associated with a loss of self per se. If a given group identity or social identity is available, it is likely that a person switches from a personal to a group identity in deindividuating circumstances (Reicher, 1984; Spears, Lea, & Lee, 1990).

The implication of this model of deindividuation for behavior is that, under deindividuating circumstances, people should be more responsive to social norms and group norms in the immediate social context. This argument can be extended, we believe, to other normative cues that are less tied to a specific social or group identity but help to define the interpretation of the situation. A good example is the Johnson and Downing (1979) study that manipulated the context cues of nurses' uniforms versus Ku Klux Klan robes. Because the SIDE model proposes that general social norms are largely independent of situational norms or norms related to specific social identities, deindividuating circumstances are hypothesized to be neutral with regard to general social norms. In sum, this approach is different from deindividuation perspectives in three key respects: (a) Deindividuation leads not to a loss of self but only to a decreased focus on personal identity, (b) deindividuation increases responsiveness to situational group norms and context norms, and (c) deindividuation is neutral with respect to general social norms.

Overall, the SIDE model would seem to be able to account for the broad thrust of the results. The model predicts a lack of overall effects associated with deindividuation manipulations. Specifically, it predicts that deindividuating manipulations should have no effect on measures of antinormative behavior that do not define *normative* as a property conveyed by the immediate context. This is confirmed by the finding that deindividuation manipulations had no consistent effect on behavior that is generally held to be antinormative. In addition, the coding of the general social norm could not account for any variance in findings. The model also predicts that deindividuating circumstances increase adherence to situational norms, as was confirmed. It is suggested that anonymity has these effects because of a heightened salience of the group identity (Reicher, 1984). No studies have investigated this proposition, and future research should be directed to testing this aspect of the SIDE model. The finding of greater responsiveness to the specific norm associated with reduced self-awareness is also consistent with this model, if reduced self-awareness equates with a shift away from individual self-focus (and toward a more social or group focus). In sum, the meta-analysis provides support for the model's main empirical predictions with regard to the effect of deindividuation on behavior but provides less direct support for the proposed underlying process.

A normative analysis such as that provided by the SIDE model sits well with two aspects of collective behavior stressed in historical and sociological analyses but conveyed less often in laboratory studies of deindividuation. One is the fact that, over time, collective behavior exhibits a remarkably consistent pattern (also in the case of violent and destructive collective action) and performs an important symbolic function for the crowd (e.g., see N. Z. Davis, 1978, who described "rites of violence"). The second is that crowds are capable of showing much more control and regulation than would appear to be possible from the social psychological accounts since Le Bon (1895/1995). As Thompson (1971, p. 229) stated with regard to food riots in England: "It is the restraint, rather than the disorder, which is remarkable; and there can be no doubt that the [collective] actions were supported by an overwhelming popular consensus." Although both aspects reflect the impact of group norms, there is an important third aspect that is not sufficiently addressed in the SIDE model. The emotional impact of collectives is very strong. Part of this emotionality may be attributed to normative aspects (e.g., when the crowd believes they have been wronged and their deeply felt injustice causes intense feelings and reactions), but there are other strong emo-

tions in the crowd that deserve further study.[12] Particularly feelings of exhilaration in collectives appear to be of a different order and may be related to a sense of power.

In conclusion, the SIDE model is able to account for the main findings of this meta-analysis that are problematic for deindividuation theory. The model has the added advantage of presenting an explanation for collective behavior that fits with historical and sociological evidence of the intergroup nature of crowd events. In this respect, the SIDE model promises to be a fruitful approach to solving the riddles of collective behavior and one that deserves further attention in the ongoing development of a social psychological theory of the crowd.

[12] Also in the reviewed literature, some studies have found evidence of altered states and emotionality (Diener, 1979; Prentice-Dunn & Rogers, 1980, 1982; Rogers & Prentice-Dunn, 1981). There are two problems with these findings, however. One is that the measures of altered states are quite variable and often include questions referring to a sense of group unity and "togetherness," which do not refer to emotions or emotional states per se. A second is that these findings were obtained only in studies using compound manipulations, and then only if there was an arousal component to that manipulation. It is questionable whether such reports of altered states are related to deindividuation when the participants, for example, engaged in collective singing and African dancing to loud Burundi drum music (Diener, 1979, p. 1163).

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Appendix

Summary of Effect Sizes and Study Characteristics

					Categorical moderator				Interval moderator				
Study	*r*	*N*	*Z*	Deviation[a]	A	B	C	D	E	F	G	H	I
Becker-Haven & Lindskold, 1978	.07	68	0.59	−0.02	1	5	1	1	2.00	0.00	10.00	6.50	3.00
Becker-Haven & Lindskold, 1978	.60	68	4.92	0.51	4	5	1	1	2.00	0.00	10.00	6.50	3.00
Carver, 1974	−.38	32	−2.18	−0.47	5	1	1	2	1.00	0.00	—	6.33	5.00
Carver, 1975, Study 1	−.11	40	−0.67	−0.20	5	1	1	2	1.00	0.50	15.00	6.33	5.00
Carver, 1975, Study 2	−.12	44	−0.78	−0.21	5	1	1	2	1.00	0.50	15.00	6.33	5.00
Diener, 1976	−.37	60	−2.84	−0.46	4	2	1	1	3.00	0.50	2.00	6.67	5.00
Diener, 1976	.30	60	2.29	0.21	3	2	1	1	1.50	1.00	2.00	6.67	5.00
Diener, 1979	.22	84	1.99	0.13	5	2	1	1	8.00	0.47	30.00	5.00	4.33
Diener et al., 1976	.25	316	4.52	0.16	2	3	2	1	2.91	—	—	6.33	2.33
Diener et al., 1976	.30	316	5.28	0.21	4	3	2	1	2.91	—	—	6.33	2.33
Diener & Kasprzyk, 1978	.00	99	0.00	−0.09	1	2	1	1	4.00	0.48	24.00	5.00	3.67
Diener et al., 1980, Study 1	.00	75	0.00	−0.09	4	2	1	1	7.29	0.50	2.00	6.00	4.67
Diener & Wallbom, 1976	.52	28	2.73	0.43	5	3	1	2	1.00	0.61	10.00	6.00	2.67
Diener, Westford, Diener, & Beaman, 1973	.26	487	5.75	0.17	4	3	2	1	4.50	—	—	5.33	2.67
Diener, Westford, Dineen, & Fraser, 1973	−.34	64	−2.75	−0.43	4	2	1	1	4.00	0.50	5.00	6.00	5.00
Diener, Westford, Dineen, & Fraser, 1973	−.08	64	−0.66	−0.17	3	2	1	1	4.00	0.50	5.00	6.00	5.00
Dion, 1970	.18	149	2.14	0.09	2	1	1	1	3.00	1.00	6.70	5.00	4.00
Drury, 1993	−.06	28	−0.32	−0.15	1	4	1	1	7.00	0.29	15.00	4.33	5.00
Erffmeyer, 1984	.21	150	2.58	0.12	4	3	3	1	3.00	1.00	9.70	5.00	2.67
Froming et al., 1982, Study 1	−.45	22	−2.11	−0.54	6	1	1	2	1.00	—	—	6.33	4.33
Froming et al., 1982, Study 1	.38	25	1.89	0.29	5	1	1	2	1.00	—	—	6.33	4.33
Froming et al., 1982, Study 2	.37	34	2.14	0.28	6	1	1	2	1.00	—	—	6.33	3.67
Froming et al., 1982, Study 2	−.30	26	−1.53	−0.39	5	1	1	2	1.00	—	—	6.33	3.67
Goldstein et al., 1981, Study 2	−.01	36	−0.04	−0.10	2	2	1	2	1.00	0.00	—	4.33	4.33
Goldstein et al., 1981, Study 3	.00	32	0.00	−0.09	6	2	1	2	1.00	1.00	—	4.33	4.33
Gordijn, 1993	−.14	56	−1.03	−0.23	1	4	1	2	1.00	—	—	5.00	3.33
Hiltz et al., 1989	.00	90	0.00	−0.09	1	2	3	1	5.00	0.80	60.00	5.67	3.33
Johnson & Downing, 1979	−.22	68	−1.84	−0.31	1	1	1	2	1.00	0.00	—	6.33	4.33
Jorgenson & Dukes, 1976	−.19	484	−4.08	−0.28	4	5	3	1	3.34	0.50	—	5.67	3.00
Karylowski, 1979, Study 1	−.25	112	−2.61	−0.34	5	4	2	2	1.00	1.00	—	5.00	4.67
Lindskold & Finch, 1982	.38	101	3.83	0.29	1	4	1	1	6.00	0.00	—	4.67	4.33
Mann et al., 1982	.12	83	1.13	0.03	1	1	1	1	7.00	0.00	12.00	5.56	4.11
Maruyama et al., 1982	.39	54	2.90	0.30	4	5	2	1	3.16	0.55	—	6.33	4.67
Mathes & Guest, 1976	.57	26	2.91	0.48	4	4	1	2	1.00	0.62	—	6.00	3.00
Mathes & Guest, 1976	.56	26	2.85	0.47	2	4	1	2	1.00	0.62	—	6.00	3.00
F. G. Miller & Rowold, 1979	.23	58	1.77	0.14	2	3	2	2	1.00	—	—	5.33	2.67
Nadler et al., 1982	.18	40	1.12	0.09	3	3	1	1	3.00	1.00	—	5.89	4.00
Orive, 1984, Study 1	.31	60	2.40	0.22	6	4	1	2	1.00	0.50	—	4.33	3.67
Orive, 1984, Study 2	.18	109	1.90	0.09	6	4	1	1	6.00	0.45	—	4.33	3.67
Paloutzian, 1975	.00	96	0.00	−0.09	4	1	1	1	3.00	0.50	20.00	4.33	4.67
Prentice-Dunn & Rogers, 1980	.12	72	0.99	0.03	3	1	1	1	4.00	1.00	—	5.00	4.33

Appendix (*continued*)

Study	*r*	*N*	*Z*	Deviation[a]	Categorical moderator A	B	C	D	Interval moderator E	F	G	H	I
Prentice-Dunn & Rogers, 1982	.31	43	2.05	0.22	6	1	1	1	4.00	1.00	20.00	6.67	4.33
Prentice-Dunn & Rogers, 1982	.35	43	2.33	0.26	3	1	1	1	4.00	1.00	20.00	6.67	4.33
Prentice-Dunn & Spivey, 1986, Study 1	.33	18	1.42	0.24	3	1	1	1	4.00	1.00	40.00	5.67	3.33
Prentice-Dunn & Spivey, 1986, Study 2	.24	91	2.33	0.15	3	1	1	1	4.00	1.00	40.00	6.00	3.33
Propst, 1979	.00	48	0.00	−0.09	3	1	1	1	4.00	—	—	5.33	3.67
Rehm et al., 1987	.56	30	3.09	0.47	3	2	2	1	5.00	0.63	10.00	4.00	4.00
Reicher, 1984	−.02	106	−0.22	−0.11	1	4	1	—	—	0.44	—	4.67	4.00
Reicher & Levine, 1994a, Study 1	.00	50	−0.02	−0.09	2	4	1	2	1.00	0.46	28.00	4.00	4.00
Reicher & Levine, 1994a, Study 2	.14	62	1.06	0.05	2	4	1	2	1.00	—	—	4.67	3.33
Reicher & Levine, 1994b	−.03	102	−0.33	−0.12	2	4	1	2	1.00	—	—	4.33	3.67
Rogers & Ketchen, 1979	.00	32	0.00	−0.09	3	1	1	1	4.00	1.00	—	5.00	3.67
Rogers & Prentice-Dunn, 1981	.28	85	2.56	0.19	3	1	1	1	4.00	1.00	—	5.00	4.67
Rule et al., 1975	.16	64	1.25	0.07	5	1	1	2	1.00	0.00	—	6.00	4.00
Scheier, 1976	−.08	95	−0.76	−0.17	5	1	1	2	1.00	1.00	—	6.67	4.33
Scheier et al., 1974, Study 1	.12	40	0.74	0.03	6	1	1	2	1.00	1.00	—	6.33	4.33
Scheier et al., 1974, Study 1	.45	40	2.83	0.36	5	1	1	2	1.00	1.00	—	6.33	4.33
Siegel et al., 1986, Study 1	.34	36	2.03	0.25	1	2	1	1	3.00	0.48	15.00	6.00	2.33
Siegel et al., 1986, Study 3	.32	36	1.92	0.23	1	2	1	1	3.00	0.57	25.00	6.00	2.33
Singer et al., 1965, Study 1	−.32	54	−2.37	−0.41	1	—	1	1	4.00	0.00	—	5.00	5.00
Singer et al., 1965, Study 2	.36	18	1.54	0.27	1	2	1	1	4.00	0.00	15.00	5.67	3.67
Spears et al., 1990	.00	48	0.00	−0.09	1	2	1	1	3.00	0.50	20.00	4.67	5.00
Vallacher & Solodky, 1979	.00	48	0.00	−0.09	5	3	1	2	1.00	0.75	15.00	6.00	3.67
G. L. White & Zimbardo, 1980	.06	76	0.51	−0.03	6	4	1	1	4.50	0.46	—	6.50	4.00
G. L. White & Zimbardo, 1980	.12	76	1.03	0.03	2	4	1	1	4.50	0.46	—	6.50	4.00
M. J. White, 1977	.37	48	2.57	0.28	3	2	1	1	4.00	0.50	16.00	5.33	3.00
Zabrack & Miller, 1972	−.44	32	−2.51	−0.53	1	1	1	1	3.00	0.00	20.00	6.00	5.00
Zimbardo, 1969, Study 1	.22	18	1.22	0.13	2	1	1	1	4.00	0.00	—	7.00	4.67
Zimbardo, 1969, Study 2	−.29	30	−1.99	−0.38	3	1	3	1	6.00	1.00	—	6.67	5.00
Zimbardo, 1969, Study 3	−.49	48	−2.09	−0.58	2	1	1	2	1.00	0.00	—	6.67	4.67

Note. Dashes indicate that data could not be obtained from the reports. A = manipulation; B = dependent variable; C = participant population; D = participants in groups; E = average group size; F = proportion of men in participant sample; G = duration of deindividuating manipulation in minutes; H = general social norm; I = situational norm. For exact details, see Table 1.

[a] Deviation from the average effect size (*r*).

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