

Because of this interest in automatic reactions, my conception is also quick to recognize that primed (i.e., automatically activated) and nonconscious goals can at times effectively restrain the anger experience with relatively little psychological and physiological cost.

I will discuss below all of these matters from the point of view of my cognitive-neoassociation perspective [Berkowitz, 1990, 1993, 2010; Berkowitz and Harmon-Jones, 2004]. As one example of a problem that has not as yet been satisfactorily addressed by proponents of the conventional understanding of this emotion, I will seek to explain why perceived legitimate frustrations at times give rise to anger, and also why thwartings seen as being socially improper are more apt to be anger-arousing than the socially warranted goal blockages.

ANGER FROM THE COGNITIVE-NEOASSOCIATION PERSPECTIVE

The Prototypic Nature of Anger Concepts

As the label I have given my formulation indicates, this analysis recognizes the important part often played by cognitive processes (both unconscious and conscious) in the nature and functioning of anger. However, for me these cognitions, particularly in regard to how people think of the anger experience, are vastly different from the cognitions proposed by most conventional analyses of this emotion.³ Russell and Fehr [1994] pointed out that these common conceptions typically follow the classical approach to the definition of concepts, and hold that *anger* has definite characteristics, “each necessary and together sufficient to determine membership in the anger emotion category” (p. 186). (Conventional appraisal theorizing essentially also takes this position [e.g., see Wranik and Scherer, 2010]. One of the troublesome aspects here, though, as Russell and Fehr [1994] noted, is that the proponents of this common approach do not always agree as to just what are these defining features and just what are the causes of this emotional state (see p. 188).

are carried out in deliberate pursuit of particular aims. My formulation suggests, however, that these controlled processing analyses often fail to give sufficient weight to those occasions in which the assault made is largely an involuntary, automatic reaction to situational events. The automatic processing in cases such as these, one can say, is initiated involuntarily by a particular kind of input, proceeds with little if any conscious guidance, and demands little attention and effort from the actor [see Schneider and Shiffrin, 1977].

³I must first acknowledge the extent to which my discussion here has been stimulated by the writings of Russell and Fehr [1994] and Shaver et al. [1987].

More important, Russell and Fehr [1994] showed that the various possible subcategories of anger (e.g. *fury*, *temper tantrum*, *annoyance*, and even *disgust* and *agitation*—see p. 192 for a more complete listing) vary meaningfully in the degree to which they are members of the anger emotion category. In the authors’ words, “In seven studies, college educated speakers of English were given opportunities to use anger and related concepts in a way predicted by the classical account. They did not” (p. 201). In this research, the perception of blameworthiness was not a necessary feature of anger, but of course, in many instances anger *is* linked to impropriety and blame. Rather than thinking of emotions in classical terms, it is far better, Russell and Fehr [1994] insisted, in accord with Shaver et al. [1987], to conceptualize people’s understanding of *anger* (and the other emotions as well) as prototypes. In essence, the likelihood that people will regard themselves as angry is a function of the degree to which their feelings resemble the prototypic conception of *anger* they have in their minds at that time. In the Russell and Fehr [1994] research, *fury* was often a somewhat better example of the notion *anger* than was *hate*, which in turn was a better instance than *annoyance* or, even less good, *irritation*. (But in addition, in one of their investigations 69% of the participants believed *disgust* belonged in the category *anger* [see p. 197]).

This evidence of the prototypic nature of the usual understanding of anger contradicts the argument advanced by a fair number of writers [e.g., Scherer, 1984] that there are different kinds of anger. Instead, what we have here are fuzzy, not sharply differentiated, variations on a theme. It is an interesting question whether these anger variations can be reliably graded in terms of their intensity. Spielberg and Reheiser [2010], among others, regarded the different subcategories of anger (e.g., *annoyance*, *indignation*, *wrath*, *fury*—see p. 405) as varying along a single dimension of intensity. Russell and Fehr [1994], however, took a different stance. Although they found some evidence of an intensity ordering, they maintained that “although intensity is one of the features that determines prototypicality, it is not the only one” (p. 193).

The cognitions about anger, of course, can also be broader than the understandings about the various subcategories of this emotional state. As many of the writers examining the prototypical nature of emotion concepts [e.g., see Russell and Fehr, 1994, pp. 201–202] have maintained, these relatively specific cognitions often are linked to a more general understanding of anger—the persons’ anger-related scenarios or scripts. For Russell and Fehr [1994], “To know the

concept of anger is to know a script . . . in which prototypical antecedents, feelings, expressions, behaviors, physiological changes, and consequences are laid out in a causal and temporal sequence” (p. 202).

Two studies by Shaver et al. [1987] spell out what are the common ways of understanding the causes of anger. In their words:

“Something (usually another person . . .) interferes with the person’s execution of plans or attainments of goals (by reducing the person’s power, violating expectations, frustrating or interrupting goal-directed activities). Alternatively, the person perceives another as harming him or her in some way (inflicting physical or psychological pain). Finally . . . the angry person makes the judgment that the frustration, interruption, power reversal, or harm is illegitimate—that the situation is contrary to what ought to be. This last element is the most frequent feature in the anger prototype, occurring in fully 95% of the self anger accounts” (p. 1077).

Causes of Anger

We have now come to what I regard as one of the central matters in the study of anger: the causes of this emotional state. As I have said in other papers [e.g., Berkowitz, 1990, 1993; Berkowitz and Harmon-Jones, 2004], the just summarized common understandings of how anger is generated are incomplete rather than wrong. There can be little doubt that these script-like cognitions predominate in the majority of occasions in which anger is aroused. But nevertheless, there are other, perhaps less common, instances that people may not adequately remember when they think about the times anger is produced. Russell and Fehr [1994] found, for example, that at least one of their participants recalled becoming very angry when he accidentally slipped at a swimming pool and bashed his knee on the edge of the pool (p. 194). Presumably because the study had asked the respondent to be aware of infrequent angering situations, he recalled that pain-elicited aggression did occur, even if not often, and regarded this situation as only a “slightly good example” of angering instances (a rating of 4 on the 6-step “good example” scale).

It is also important to recognize that script conceptions of angering episodes can be oversimplified, as the summary provided by Shaver et al. [1987] illustrates. According to these writers, I noted before, their respondents indicated that illegitimate frustrations were the most frequent cause of their own anger. Illegitimate thwartings may be a major source of anger, but they are definitely not the only cause of this emotion. My survey of the research bearing on the frustration–aggression hypothesis [Berkowitz, 1989; also, Berkowitz, 1993] indicates the relationship between frustration and anger/aggression is more com-

plicated than the conventional analysis would have us believe. People sometimes are not angered when they are prevented from attaining their goals, and furthermore, they are at times angered when the goal blockage is clearly socially legitimate. To account for these findings, I suggested that frustrations generate anger and aggressive inclinations only to the extent that they are decidedly unpleasant.

Automatic Processes Emphasized by the Cognitive-Neoassociation Model

My fundamental contention is that anger-arousing occurrences are not necessarily blameworthy or even frustrating in nature—but they always are aversive. However, it is necessary to recognize another way the present theoretical formulation differs from the conventional understandings of anger—by placing greater emphasis on automatic reactions. Moreover, along with several other theoretical models [e.g., Lang and Davis, 2006; Leventhal, 1984] also proposing that a sequence of factors enters into the arousal and functioning of anger, my cognitive-neoassociation analysis [e.g., Berkowitz, 1990, 1993, 2010; Berkowitz and Harmon-Jones, 2004] holds that the anger process often changes over time as various factors come into play. However, independently of these changes that may occur over time, my contention is that the *initial* emotional reactions in the arousal of anger are *automatic* responses to two kinds of factors discussed next.⁴

Relatively intense negative effect stemming from a decidedly aversive event. A now impressive range of studies, both correlational and experimental in nature, testify to the frequency with which decidedly unpleasant occurrences give rise to angry feelings and aggressive inclinations. I would not review this literature here [see Berkowitz, 1990, 1993] except to note that the strongly negative feelings can be externally produced (such as by oppressively high atmospheric temperature, the cold pressor test, or situational stresses) or can be reactions to internally derived negative feelings (such as strong, agitated depression, chronic pain, or even shame). My model holds that these aversive occurrences can give rise to either “fight” or “flight” reactions, with the immediate situation, prior learning, and genetic dispositions

⁴All this is not to say, of course, that the strongly aversive occurrence does not produce other affective states as well. Anxiety and/or fear and/or other negative emotions may well also arise, and indeed, decidedly unpleasant events often produce blends of feelings. A host of factors—genetic, learned, and situational—governs the relative dominance of these different emotional constellations, but the present model holds that anger is also activated, even if at only a low level of awareness [Berkowitz, 2010; Berkowitz and Harmon-Jones, 2004].

determining which urge is dominant at the time. I am here concerned only with the “fight” (anger and/or aggressive) inclinations.⁵

External or internal stimuli that are associated with a very unpleasant happening and/or with other angering/aggressive incidents. Evidence of these associative effects is also quite clear. To cite only a few examples, it is now been repeatedly demonstrated that the mere presence of weapons enhances the likelihood of attacks on a suitable target [first reported by Berkowitz and LePage, 1967] to the degree that these objects prime thoughts of intentionally hurting others rather than ideas about pleasant activities such as recreational hunting [Bartholow et al., 2005]. This “weapon effect” can arise in people who are not angry at that moment (e.g., see research by Frodi, and by Turner et al. cited in Berkowitz [1993, p. 73]) as well as in angry persons, but of course, the latter are more strongly affected aggressively [see Berkowitz, 1993, pp. 71–75]. There is little direct evidence to date that this priming activates angry feelings as well as aggressive thoughts and motor impulses, but my theoretical analysis as well as Anderson’s General Aggression Model [e.g., Bartholow et al., 2005] clearly propose that angry affect can also arise, and I will here assume that this is so. Observed actions also having an aggressive meaning (e.g., scenes of fighting) also increase the chances that susceptible audience members will act aggressively, in part because of the priming of aggressive scripts, but people who happen to be associated with the victims of the witnessed aggression are also apt to be targets of the elicited aggressive inclinations [Berkowitz and Geen, 1966; also see Berkowitz, 1993]. Extending this theoretical perspective even further, yet another experiment [Fraczek, cited in Berkowitz, 1993, p. 76] showed that stimuli not having a clear aggressive meaning in themselves (in this case a yellow light), but that have been associated with a painful occurrence, can intensify aggressive reactions.

Bodily feedback effects are yet another example [see, e.g., Adelman and Zajonc, 1989; Duclos et al., 1989]. Skeletal-muscular movements that are associated with anger and/or aggression can also activate this emotional state.

⁵Interestingly, Gray, in his revised Reinforcement Sensitivity Theory (Gray and MacNaughton, 2000), among others such as Izard [1991], advanced a somewhat similar argument. He maintained that aversive stimuli tend to activate a single fight/flight/freeze mechanism that prompts either fight, flight, or freezing reactions depending on the total stimulus context. This theory suggests that if the aversive stimulus is somewhat distant (psychologically), flight or freezing occurs, whereas a fight response is evoked when the stimulus is more proximal or immediate.

However the anger is produced, the emotion sensations might then automatically activate a suitable anger-related script. In one of the experiments published by Keltner et al. [1993], as a case in point, participants were led to be either angry or sad through a noncognitive manipulation—by having them adopt either an angry or sad pose. In contrast to their sad counterparts, the angry persons were then more apt to blame others for any problems they might anticipate.

The people affected by these anger-arousing factors are not necessarily fully conscious of their first, automatically elicited reactions, but cognitive processes activated soon afterwards can heighten awareness of these sensations. As a consequence, the anger and/or aggressive inclinations can then be intensified or suppressed depending on the particular circumstances. There is also the possibility, since the motoric and other components of the anger syndrome are separable, that the aggressive motor impulses might be controlled although angry feelings persist. Krieglmayer et al. [2009] pointed to such a separation when they noted that, in their study, “apologizing information was effective in decreasing subsequent aggressive behavior but not in reducing anger” (p. 379). Cognitive processes can restrain open attacks on some target without completely abolishing the experience [or sensations] of anger. I will expand upon this last-mentioned observation in later sections of this article.

Aggression-Related Motor Impulses and the Experience of Anger

People who have just been angered obviously do not always attack those who provoked them. Recognizing this, a number of writers have held that anger produces only a readiness or predisposition to aggression, but not an urge to assault the perceived offender. Frijda [e.g., 2004] offered the strongest version of this thesis when he argued “emotional experience is, to a large extent, an experienced action tendency or experienced state of action readiness. Feelings of anger are not feelings of fists clenched, but of the embodied desire to silence by force a hateful opponent” (p. 161).

I agree with part of Frijda’s conception—that an “experienced action tendency” is usually part of the anger syndrome. For me, two different processes may be involved in this tendency.⁶ One of these could be a cognitive priming in which anger-related ideas come readily to mind, thereby facilitating the open

⁶My thinking here has been prompted by Finkel et al.’s [] concept of impellance, a set of processes activated within the person after the instigation that influences whether the associated behaviors will then occur.

display of anger, and then too, as specified by Frijda, anger/aggression motor reactions may also be activated. With my emphasis on these automatically produced responses, I prefer to say “tendency” rather than “readiness” because I suspect the action tendency is often ongoing, at least at a low level, even when it is not manifested in overt behavior. All in all, I suggest that Frijda’s contention, taken as a whole, unduly minimizes the great (but not total) part played by what Lang and Davis [2006] termed “reflexive impulsive actions”⁷ in the anger syndrome.

Quite a few investigations have reported aggression-related motor impulses accompanying the aroused angry feelings. In the study reported by Shaver et al. [1987], as one example, the participants’ prototypic conception of anger frequently included “verbally attacking the cause of the anger,” “loud voice, yelling, screaming, shouting,” “hands or fist clenched,” “pounding on something, throwing things” (p. 1078). Somewhat similarly, in the Fitness and Fletcher [1993] examination of the anger felt by people toward their relationship partners, about half of the respondents indicated they at times experienced tense muscles, and felt an urge to express verbal hostility, and to yell and/or throw something (p. 952). Roseman et al. [1994] obtained comparable results when they asked their respondents to recall their experiences of particular negative emotions. Much more than the other emotions, anger apparently was often accompanied by feeling such as yelling, wanting to hit someone, and wanting to hurt someone (p. 213). These last-mentioned authors concluded “our data supported the conception of anger as an emotion that involves attacking to hurt another person” (p. 213). Clearly, there is a motivational aspect to the anger experience.

Anger as an Approach Motivation

We can say more about the motivational concomitant of anger by generalizing from the important research by Harmon-Jones and his colleagues [e.g., Harmon-Jones et al., 2003, 2010; also see Carver and Harmon-Jones, 2009]. Although anger is typically regarded as a negative emotion, so that we ordinarily would expect it to be linked to withdrawal tendencies, Harmon-Jones has convincingly demonstrated that angry feelings are frequently associated with approach, not avoidance, inclinations—that is,

with “movement toward the perceived source of the anger” [Harmon-Jones et al., 2010, p. 64]. He has also noted that angry research participants sometimes report feeling more active, alert, proud, and strong than their control counterparts and suggested that this positive effect “may assist in promoting goal-directed action.” He also suggests that the “same neural circuitry [in the left midfrontal cortex] involved in approach-oriented anger is activated for general goal-directed actions” [Harmon-Jones et al., 2010, p. 63]. Also attesting to the essentially positive nature of the anger approach motivation, a recent investigation [Harmon-Jones et al.,] demonstrated that people with a relatively positive attitude toward the anger emotion were particularly apt to experience anger when they encountered anger-associated stimuli, whereas those with a positive attitude toward fear tended to feel relatively little fear on being exposed to fear-related stimuli.

Harmon-Jones [see 2010, p. 64] did not explicitly take a position as to whether the anger approach motivation is very general or is specifically focused on doing injury to another. I myself prefer the latter view. And furthermore, since people high in trait anger often tend to display an increased left frontal cortical activity similar to that manifested by those who are actively angry [see Harmon-Jones et al., 2010], I suggest that the aggressively oriented approach motivation is very easily aroused in persons characteristically disposed to be easily angered, and perhaps, may even be ongoing in them much of the time at a very low level of excitation. Another Harmon-Jones investigation [Harmon-Jones et al., 2003] tells us more about the nature of the anger-associated approach motivation. I have long proposed [e.g., Berkowitz, 1962] that the goal of the anger–aggression syndrome is the removal of an aversive situation, primarily by the destruction of the aversive source. Although Harmon-Jones does not say this explicitly, it seems likely that the anger-induced approach motivation is basically a striving to remove the effectively disturbing stimulus, usually (but not necessarily only) by its destruction or injury. However, following Neal Miller’s [1948] classical analysis, we have to realize that the strength of this inclination is a function of the psychological “closeness” to the aggressive goal and/or the presence of aggression-related cues [see Miller, 1948, and also Berkowitz, 1962, p. 33, 1993, among other references].

The just mentioned Harmon-Jones et al. [2003, also see Harmon-Jones et al., 2010, p. 69] experiment points to this kind of variation in anger-induced approach motivation. In this study, university students were provoked by a message, supposedly from an

⁷Lang [e.g., Lang and Davis, 2006] has long maintained that threat cues activate a motivational circuit in the brain that prompts reflexive impulsive defensive reactions including aggression, but prefers to characterize these reflexes as bringing about only a readiness for this defensive reaction.

official source, that there soon would be a tuition increase. However, only some of these people were also led to think they could take action against the tuition proposal by spreading antituition-rise petitions. These particular students—who might conceivably eliminate the unpleasant disturbance (and perhaps also implicitly hurt those proposing the tuition increase)—exhibited the greatest increase in left frontal cortical activity, indicating the largest rise in anger-approach motivation. The students able to spread the antituition petitions were, in comparison to their control counterparts, psychologically closer to the goal of removing the aversive stimulus, and perhaps also in attacking the aversive source, so their anger-approach inclinations were now strong enough to become manifest.

Aggression-Heightening Effects of Pain Cues

Other relevant research has to do with the effects of pain cues. Because one of the anger-approach motivation's primary goals is the destruction, or at least injury, of the aversive source, provoked people should think they are on the way to the attainment of this goal when they receive information that the target is being hurt to some degree (but perhaps not very severely), so that their anger approach tendency is then intensified. Signs that the target feels pain (i.e., gives off pain cues) when he or she is attacked could provide this approach heightening information. In keeping with this possibility, an experiment by Baron [1979] showed that angry white men punished the white person who had provoked them earlier especially intensely after learning he had been hurt by a preliminary treatment, whereas this pain cue led to much weaker punishment of the target if he had not angered them before.⁸ An experiment by Hartmann [1969] adds to this evidence. Adolescents who had either just been provoked or who had been treated in a neutral manner watched a brief film showing two youngsters fighting. In one case, the movie focused on the fight loser's painful beating, whereas in another condition the film

concentrated on the victor's actions. When all of the participants then had an opportunity to punish their provocateur with electric shocks, the angry boys punished him more severely after they had watched the pain cues film than after seeing the victor's successful aggression. Here, the sight of another person—not the provocateur—suffering from aggression apparently had moved the angry participants psychologically closer to the anger goal, thereby intensifying their anger approach motivation and thus leading to stronger attacks. Not surprisingly, angry people might also be pleased by the information about their tormentor's presumably appropriate pain. Sebastian [see Berkowitz, 1993, p. 174; Baron, 1979] found that his angered male participants reported greater pleasure the more intense was the level of pain they supposedly had inflicted on their provocateur. The stronger the target's suffering, the closer they were to their angry goal, and this was pleasant.

On Reaching the Aggressive Goal

The proceeding findings do not mean, however, that the angry persons will become ever more aggressive as they learn of the target's suffering. There apparently is some point at which the angry persons think their target has suffered enough—that their aggressive goal has been reached—and they then are less motivated to hurt their target. (The experimental research is not altogether consistent on this matter, indicating that the level at which the aggressive goal is regarded as attained varies from situation to situation, depending on a variety of factors including one's anger intensity.) Furthermore, laboratory results indicate that this reduction in aggressive motivation might occur even when someone other than the angry individual hurts the aversive agent. (Although the participants' anger usually was not assessed in this body of research, typically only their aggressive actions, two fairly recent investigations [Bresin and Gordon, unpublished research; Verona and Sullivan, 2008] indicate that the level of the openly displayed aggression in these studies is probably directly related to the intensity of the participants' anger.)

In the study by Bramel et al. [1968], some insulted participants watched a videotape showing their annoyer suffering while under the influence of a drug. Even though they knew the tape had been made some time in the past, and therefore that they had no role in causing the provocateur's strong discomfort, they subsequently were less critical of their annoyer than were their noninsulted counterparts. Doob and Wood [1972] obtained comparable findings. Here, the angry participants either hurt their provocateur with electric shocks, or watched someone else deliver the

⁸When the angered white participants were dealing with a black provocateur, however, the pain cue led them to restrain their punishment of this person. (I thank the editor, Prof. Huesmann, for calling my attention to the Baron [1979] study.) I should note that an earlier experiment by Baron [1974] failed to show that angry participants attacked their antagonist more strongly after seeing pain cues. It could be that the persons in this "unsuccessful" study were insufficiently disposed to act aggressively so that their qualms about aggression restrained their open attacks. In the Hartmann [1969] study about to be cited, as well as in another pain cues experiment conducted in Spain [Perez-Albeniz and DePaul, 2005], the sight of the pain cues intensified the angry participants' aggression most strongly when they had strong personality dispositions to be aggressive.

punishment, or knew no one had shocked their annoyer. Immediately afterwards, when these people could again give the provocateur shocks, they were least punitive if this annoyer had been hurt before—either by themselves or by the other person. By contrast, those who had not seen the provocateur hurt were now most aggressive of all.

Although these findings seem to support the idea of an aggression catharsis—the “drainage of aggressive energy” through aggressive behavior—other research results show that this classic notion is much too simple [see Berkowitz, 1962, for an overview of this research as of the early 1960s]. The best alternative, as I have indicated, is that when angry persons believe the aversive agent has been sufficiently injured, they think they have achieved their aggressive goal, so that, in essence, their aggressive response sequence is completed [see Berkowitz, 1962, pp. 220–221]. More relevant to this article’s emphasis on anger, this goal attainment results in a reduction of physiological tension (unless, of course, the aggressors feel guilt or shame). We can see this in the pioneering investigation by Hokanson and Burgess [; also see Berkowitz, 1962, pp. 222–224]. The deliberately angered participants in the Hokanson study had a substantial reduction in both their systolic blood pressure and heart rate after they attacked their tormentor by giving him electric shocks or by rating him unfavorably on a questionnaire. Later research, by Geen et al. [1975] and Verona and Sullivan [2008], have generally corroborated this finding by again showing that angered people have a reduction in indicators of physiological tension after they attack their frustrater (here too, with electric shocks).⁹ What is especially important for us here, in the Verona–Sullivan [Verona and Sullivan, 2008] experiment the extent of heart rate reduction predicted how aggressive the provoked participants later were in a final block of trials. (This relationship was not explicitly tested in the Geen et al. [1975] study, although the researchers reported that the previously angered persons who had been given the opportunity to punish their tormentor were the most aggressive participants later). Rather than indicating a “drainage” of aggressive “energy,” the investigators agreed [also see Geen, 1990, pp. 190–191; Berkowitz, 1962, p. 201] that the lowered physiological tension was reinforcing, and thereby strengthened the angered participants’ urge to attack the aversive agent. A more recent investigation [Bresin and Gordon, unpublished research provides still more corroboration for this general line

of thought. In this case, the participants who had the greatest decrease in their reported anger after they had attacked their provocateur in a prior experiment—thus, whose aggression was presumably most reinforced by the reduction in anger—were later relatively highly aggressive in a “real-life” setting when they were angered by someone they happened to encounter. We can generalize further: It could well be, as Bushman et al. [2001] have indicated, that angry persons attack their provocateur, in part at least, because they know they will feel better afterwards.

Individual Differences in the Expression of Anger/Aggression and Anger Regulation

Differences in anger expression. Whatever the specific reasons, including differences in prior reinforcements for aggression, there clearly are substantial individual differences in the proclivity to overt aggression after being provoked. In studying these variations, a number of researchers have contrasted the persons who frequently seek to restrain their overt display of anger with those who are very prone to show their anger openly [Spielberger and Sydeman, 1994]. In terms of Spielberger’s [Spielberger and Reheiser, 2010; Spielberger and Sydeman, 1994] widely employed STAXI Inventory, the former, Anger-In, people are apt to endorse items such as “I boil inside, but I don’t show it; I keep things in,” whereas the latter, Anger-Outs, typically are much more impulsive and agree that “[when] I lose my temper; I strike out at whatever infuriates me.” Although the “In” and “Out” subscales are empirically independent [Spielberger and Sydeman, 1994], both sets of high scorers on these two indices tend to have strong psychophysiological reactions to the triggering event. Going further, I also believe the high-scoring “Ins” might well have an urge to attack an appropriate target (after all, they are “boiling inside” and have angry feelings [see Spielberger and Sydeman, 1994]). Presumably because of their cognitive controls, however, this aggressive impulse is inhibited and essentially separated from their automatic, anger-related physiological reactions. One consequence is that their often suppressed anger reactions frequently lead to a heightened sensitivity to stressful occurrences, and even elevated blood pressure and hypertension [Gross and Levenson, 1997; Spielberger and Reheiser, 2010; Spielberger and Sydeman, 1994].

Self-regulation of anger. Considered another way, we can say the Anger-Ins are apt to engage in a suppressive self-regulation of their aggressive inclinations. We have now come to a brief look at the rapidly mounting body of research into the self-regulation of emotional reactions from the perspective of the

⁹The Verona–Sullivan [Verona and Sullivan 2008] experiment noted that the shock intensity was significantly correlated with verbal indicators of anger.

cognitive-neoassociation model. Because of space limitations, I will focus mostly on social psychological research, and unfortunately, will say little about the many studies of the control of emotionality by investigators in fields such as child and clinical psychology [e.g., Gagne and Goldsmith, 2011; Kim and Deater-Deckard, 2011]. Most importantly, we will see that the self-regulation involving active cognitive processing can be psychologically “costly” in various ways, and of particular interest to my conception, that automatically activated nonconscious goals can at times restrain open anger reactions with a minimum of these “costs.”

There of course are different kinds of self-regulation. Clinical and consulting psychologists have successfully made use of a variety of self-control methods in their treatment of the anger disorders [e.g., see Diguseppe and Tafrate, 2001]. As one example, Defenbacher et al. [1994] examined the effects on felt anger of two kinds of self-control treatments: social skills training in comparison with a combination of reappraisal and relaxation training. Although both control treatments had some benefits, the reappraisal and relaxation combination evidently was more successful in reducing the outward expression of anger. People can benefit from learning to interpret otherwise bothersome occurrences in a positive manner, but indicating the anger-strengthening effects of physical tension, they apparently do even better if they also learn to relax at the same time. There also has been a good deal of research into the role of attention in producing self-control [e.g., Kim and Deater-Deckard, 2011]. But of special interest to us here, Gross and his associates [e.g., Gross, 1998, 2001; Gross and John, 2003] have differentiated between the self-control processes that are employed before the emotion is fully developed (such as situation modification, attentional deployment, and reappraisal) and those that operate after the emotion arises. In this latter case, they emphasized response suppression, the process most likely to be employed by Spielberg’s previously mentioned Anger-Ins.

This suppression is not attained without a fair amount of mental effort. There is suggestive evidence of this in Pennebaker’s [1989] studies of the benefits of talking about one’s disturbing feelings. He proposed that if people suppress their emotional reactions for a prolonged period of time, rather than talk to others about their feelings, they have to engage in continued mental work to keep their reactions restrained. Sheppes and Gross [2011] offered a similar proposition. In their view, regulation strategies that are employed in the late stages of information processing, such as response suppression, require considerable mental

effort, so that these strategies are less effective the more intense is the emotional state. By contrast, according to these writers the other strategies that operate relatively early, such as reappraisals, theoretically require less mental effort, and their efficacy is relatively unaffected by emotion intensity.

Gross and his colleagues [e.g., Gross, 2001; Gross and John, 2003; Richards, 2004; Richards and Gross, 2000] have repeatedly demonstrated that the reappraisal of decidedly unpleasant events is more beneficial to those affected than is their suppression of their negative affective reactions. Where suppression lessens the open display of the emotion, unlike reappraisal it often fails to decrease the experience of this affective state, and may even impair memory for the emotion-producing occurrence. In one study [cited in Richards, 2004], as an example, “romantic partners who reappraised potentially upsetting conversations . . . showed better memory for the conversations [later] than partners who were asked to suppress their emotions while the conversations took place” (p. 133). The Gross team also extended their analysis by looking at the personality differences between people who habitually tend to inhibit their emotional reactions and others who are prone to engage in reappraisal as their self-regulation strategy. According to Gross and John [2003], even though suppressors typically attempt to hide their negative feelings, they also tend to experience and express less-positive emotions, and are not as good as the reappraisers in their interpersonal functioning generally. Yet, another investigation [Mauss et al., 2007b] also testified to the benefits experienced by persons who frequently reappraise stressful situations. On subjecting both frequent and less-frequent reappraisers to a laboratory provocation, the researchers found that the former had a better adaptation to the disturbing occurrence; they reported feeling less anger and other negative emotions, as well as more positive emotions, and also displayed a greater cardiac output.

But even though reappraisals evidently are better than response suppression in a number of respects, this does not necessarily mean that the reinterpretation of the disturbing event does not have a price. The self-regulating person actively chooses to construct the new way of looking at the critical event, and according to Baumeister and his associates [e.g., Baumeister et al., 1998; Baumeister and Vohs, 2004; Muraven et al., 1998], this act of volition essentially reduces the person’s capacity for additional self-control for a time afterwards. As Baumeister put it in his paper with Schmeichel [see, Baumeister and Vohs, 2004], cognitively controlled self-regulatory strategies are different from other self-control modes that

are quicker and more automatic in operation. The utilization of self-controlled cognitions depletes self-regulatory resources (he also termed this an “ego depletion”) so that other efforts at self-control soon afterwards are less successful. A series of experiments reported by DeWall et al. [2007] demonstrated such a self-regulatory depletion. If the participants had first been required to restrain themselves and then were angered, they were more aggressive to their provocateur than were their counterparts who had not exercised the earlier self-control. For a while anyway, one attempt at self-control evidently lessens later self-regulation. Finkel et al. [] extended this line of thought in four investigations of intimate partner violence. In all of the studies, measures of a person’s disposition to aggression “was an especially robust predictor” of this individual’s aggressiveness toward his/her intimate partner when the strength of the attacker’s self-regulating controls had been depleted. The research showed that such a weakening of self-control can come about in different ways, and not only as a result of an earlier act of self-regulation, for example, as a consequence of fatigue or psychosocial stress. Indeed, a comprehensive meta-analysis of 83 studies [Hagger et al., 2010] also testifies to the broad range of factors that can be “ego depleting,” such as a prior difficult task, fatigue, negative affect, and even low blood sugar levels. In general, these investigators concluded, “self-control is a finite resource that determines capacity for effortful control over dominant responses and, once expended, leads to impaired self-control task performance” (p. 495).

Also pointing to the negative effects of anger suppression, the anger inhibition might even “backfire” and prolong the anger feelings by producing what Wegner et al. [1993] termed an “ironic” effect. In accord with Wegner’s thinking, Burns et al. [2008] have reported that “although suppression may subdue anger-related thought, feeling and behavior initially, it may paradoxically lead to increased accessibility of anger-related material over time” (p. 268). Such an ironic effect is especially likely to occur if the person’s “mental capacity to achieve control” is reduced at the time, for example by “cognitive load, stress, or time pressure” [Wegner et al., 1993, p. 1093].

All in all, we have seen that anger control requires at least some mental effort, even if this regulation is achieved through a reappraisal of the critical occurrence, and that as a result, a “cost” is often paid in increased sympathetic activation of the cardiovascular system and a reduced capacity for further self-control soon afterwards. Mauss et al. [2007a] have suggested a solution to this problem: initiate the regulatory process automatically and fairly effortlessly, usually out-

side of conscious awareness. In their research, the desirable self-control was primed automatically, outside of the participants’ awareness, by having them construct brief sentences having a self-control meaning. The self-regulation apparently occurred. When they were tested later after being deliberately angered, they reported feeling relatively little anger and without “the cost of elevated negative emotions or maladaptive cardiovascular responding . . . ” (p. 706).

SOME CONCLUDING THOUGHTS

In this article, expounding upon my cognitive-neoassociation analysis of anger and aggression, I have maintained that the conventional, everyday conceptions of anger shared by the preponderance of emotions researchers are seriously incomplete. These formulations essentially think of emotions generally, and anger in particular, as having specific and necessary defining characteristics, and thus they typically fail to recognize the prototypic nature of this affective state. The various anger-related experiences, whether they are labeled *fury* or *annoyance* or *irritation* or even at times *disgust*, are not altogether different kinds of anger, but rather fuzzy, not sharply differentiated, variations on a theme. Then too, the prevailing analyses usually emphasize how people generally decide to attack some perceived wrongdoer, and tend to neglect the part played by automatically generated impulsive anger/aggression reactions. Perhaps most important from the cognitive-neoassociation perspective (as well as from the point of view taken by Anderson’s [e.g., Anderson and Carnagey, 2004] general aggression model), the conventional, everyday thinking about the determinants of anger typically attributes this emotion to illegitimate frustrations and/or to some blameworthy action, and ignores the great many studies showing that anger can also be produced by decidedly aversive events, facial and bodily actions associated with anger, and situational stimuli linked to anger and aggression.

In highlighting these omissions, I am not calling for the complete rejection of the prevailing ideas about anger. With Russell and Fehr [1994], I believe “Psychologists must study the everyday concept of anger, for it is a psychological phenomenon as worthy of study as any” (p. 203). This conventional thinking applies fairly well to the many instances in which anger is aroused. But I also believe, and again with Russell and Fehr [1994], that “psychologists need not use [or confine themselves to] the everyday concept of anger in their theories of the events referred to as anger, for science must be ever open to new conceptualizations” (p. 203).

As a relatively new conceptualization, the cognitive-neoassociation model suggests, at the very least, that investigations of anger should look more closely into the psychological processes involved in the emotion arousal, especially in regard to the interaction of cognitively controlled and more automatic, nonconscious processes. One example has to do with the effects of anger-related facial and bodily movements [see Adelman and Zajonc, 1989; Duclos et al., 1989]. We might ask here whether the anger-related scripts that at times come to mind when the appropriate bodily movements are made [see Huesmann, 1998; Keltner et al., 1993] are only parallel accompaniments of the feelings or are necessary mediators to the anger experience. And furthermore, whether or not the activated scripts serve as mediators to angry feelings, does the movement-produced anger experience include aggression-related motor reactions? These latter reactions might be manifested in such actions as relatively intense and/or long presses on a button delivering an unpleasant blast of noise to someone else when the person is engaged in a distracting task.

In much the same vein, we might delve deeper into the kind of question posed by Ray et al. [2008]. They (and many others) demonstrated that reappraisals of unpleasant occurrences tend to have less-negative consequences for the person than do ruminations over these events, and these writers asked what the ruminators think about. We can also inquire into the thoughts of the reappraisers. For instance, just what kind of reappraisals are most effective in reducing physiological “costs” when one is the victim of a blameworthy action? Minimizing the damage to the self? And/or minimizing the benefits to the blameworthy actor? And/or thinking of the actor as not having really intended the aversive action? If the victim is angry at the time, the reappraisal conceivably might be most effective in lowering the “costs” if it says that the offender has gained little from his/her improper action.

Taking up only one more matter, I have also attempted to look somewhat more closely than is usually done into the effects of the self-regulatory processes. In line with Baumeister’s [e.g., Baumeister et al., 1998; Vohs et al., 2008] analysis holding that self-control is a limited resource, I cited research indicating that the self-regulatory reactions requiring continued and/or repeatedly employed active cognitive processing can be psychologically “costly” in a number of ways: perhaps such as in an inadequate interpersonal functioning, in depleted self-regulatory resources, and even in an ironic effect in which anger-related memories persist over time. But relatively little is known as to just what psychological processes are

involved when “willpower” is exerted and, to put this another way, the decision is made to restrain one’s emotional reactions. Just what is the nature of the information/cognitive processing when people seek to control their emotional reactions? We do not really know.

ACKNOWLEDGMENT

I thank C. Nathan DeWall and Eli Finkel for their comments on an earlier draft of this paper. Needless to say, whatever flaws there are in my argument are my responsibility alone.

REFERENCES

- Adelman P, Zajonc R. 1989. Facial efference and the experience of emotion. *Ann Rev Psychol* 40:249–280.
- Anderson C, Carnagey N. 2004. Violent evil and the general aggression model. In: Miller A, editor. *The social psychology of good and evil*. New York: Guilford. pp 168–192.
- Averill J. 1983. Studies on anger and aggression: Implications for theories of emotion. *Am Psychol* 38:1145–1160.
- Baron, R. 1974. Aggression as a function of victim’s pain cues, level of prior anger arousal, and exposure to an aggressive model. *J Pers Soc Psychol* 29:117–124.
- Baron, R. 1979. Effects of victim’s pain cues, victim’s race, and level of prior instigation upon physical aggression. *J Appl Soc Psychol* 9:103–114.
- Bartholow B, Anderson C, Carnagey N, Benjamin A. 2005. Interactive effects of life experience and situational cues on aggression: The weapons priming effect in hunters and nonhunters. *J Exp Soc Psychol* 41:48–60.
- Baumeister R, Bratslavsky E, Muraven M, Tice D. 1998. Ego depletion: Is the active self a limited resource? *J Pers Soc Psychol* 74:1252–1265.
- Baumeister R, Vohs K. 2004. *Handbook of self-regulation*. New York: Guilford Press.
- Berkowitz L. 1962. *Aggression: A social psychological analysis*. New York: McGraw–Hill.
- Berkowitz L. 1989. Frustration–aggression hypothesis: Examination and reformulation. *Psychol Bull* 23:70–84.
- Berkowitz L. 1990. On the formation and regulation of anger and aggression: A cognitive–neoassociationistic analysis. *Am Psychol* 45:494–503.
- Berkowitz L. 1993. *Aggression: Its causes, consequences, and control*. New York: McGraw–Hill.
- Berkowitz L. 2010. Appraisals and anger: How complete are the usual appraisal accounts of anger? In: Potegal M, Stemmler G, Spielberger C, editors. *International handbook of anger*. New York: Springer. pp 267–286.
- Berkowitz L, Geen R. 1966. Film violence and the cue properties of available targets. *J Pers Soc Psychol* 3:525–530.
- Berkowitz L, Harmon-Jones E. 2004. Toward an understanding of the determinants of anger. *Emotion* 4:107–130.
- Berkowitz L, LePage. 1967. Weapons as aggression-eliciting stimuli. *J Pers Soc Psychol* 7:202–207.
- Bramel D, Taub B, Blum B. 1968. An observer’s reaction to the suffering of his enemy. *J Pers Soc Psychol* 8:384–392.
- Burns J, Quartana P, Bruehl S. 2008. Anger inhibition and pain: Conceptualizations, evidence and new directions. *J Behav Med* 31:259–279.

- Bushman B, Baumeister R, Phillips C. 2001. Do people aggress to improve their mood? Catharsis beliefs, affect regulation opportunity, and aggressive responding. *J Pers Soc Psychol* 81:17–32.
- Carver C, Harmon-Jones E. 2009. Anger is an approach-related affect: Evidence and implications. *Psychol Bull* 135:183–204.
- Deffenbacher J, Thwaites G, Wallace T, Oetting E. 1994. Social skills and cognitive-relation approaches to general anger reduction. *J Consult Psychol* 41:386–396.
- DeWall, C., Baumeister R, Stillman T, Gailliot M. 2007. Violence restrained: Effects of self-regulation and its depletion on aggression. *J Exp Soc Psychol* 43:62–76.
- Digiuseppe R, Tafrate R. 2001. A comprehensive treatment model for anger disorders. *Psychother Theor Res Pract Train* 38:262–271.
- Doob A, Wood L. 1972. Catharsis and aggression: Effects of annoyance and retaliation on aggressive behavior. *J Pers Soc Psychol* 22:156–162.
- Duclos S, Laird J, Schneider E, Sexter M, Stern L, Van Lighten O. 1989. Emotion-specific effects of facial expression and postures on emotional experience. *J Pers Soc Psychol* 57:100–108.
- Finkel E, DeWall C, Slotter E, McNulty J, Pond R, Atkins D. 2012. Using I³ theory to clarify when dispositional aggressiveness predicts intimate partner violence penetration. *J Pers Soc Psychol* 102:533–549.
- Fitness J, Fletcher G. 1993. Love, hate, anger, and jealousy in close relationships: A prototype and cognitive appraisal analysis. *J Pers Soc Psychol* 65:942–958.
- Frijda N. 2004. Emotions and action. In: Manstead A, Frijda N, Fischer A, editors. *Feelings and emotions: The Amsterdam symposium*. New York: Cambridge University Press. pp 158–173.
- Gagne J, Goldsmith H. 2011. A longitudinal analysis of anger and inhibitory control in twins from 12 to 36 months of age. *Dev Sci* 14:112–124.
- Geen R. 1990. *Human aggression*. Milton Keynes, UK: Open University Press.
- Geen R, Stonner D, Shope G. 1975. The facilitation of aggression: Evidence against the catharsis hypothesis. *J Pers Soc Psychol* 31:721–726.
- Gray J, McNaughton, N. 2000. *The neuropsychology of anxiety*. 2nd edition. New York: Oxford University Press.
- Gross J. 1998. The emerging field of emotion regulation: An integrative review. *Rev Gen Psychol* 2:271–299.
- Gross J. 2001. Emotion regulation in adulthood: Timing is everything. *Curr Dir Psychol Sci* 10:214–219.
- Gross J, John O. 2003. Individual differences in two emotion regulation processes: Implications for affect, relationships, and well-being. *J Pers Soc Psychol* 85:348–362.
- Gross J, Levenson R. 1997. Hiding feelings: The acute effects of inhibiting negative and positive emotion. *J Abnorm Psychol* 106:95–101.
- Hagger M, Wood C, Stiff C, Chatzisarantis N. 2010. Ego depletion and the strength model of self-control: A meta-analysis. *Psychol Bull* 136:495–525.
- Harmon-Jones E, Harmon-Jones C, Amodio D, Gable P. 2011. Attitudes toward emotions. *J Pers Soc Psychol* 101:1332–1350.
- Harmon-Jones E, Peterson CK, Harmon-Jones C. 2010. Anger, motivation, and asymmetrical frontal cortical activations. In: Potegal M., Semmler G, Spielberger C, editors. *International handbook of anger*. New York: Springer. pp 61–78.
- Harmon-Jones E, Sigelman J, Bohlig A, Harmon-Jones C. 2003. Anger, coping, and frontal cortical activity: The effect of coping potential on anger-induced left frontal activity. *Cogn Emot* 17:1–24.
- Hartmann D. 1969. Influence of symbolically modeled instrumental aggression and pain cues on aggressive behavior. *J Pers Soc Psychol* 11:280–288.
- Hokanson J, Burgess M. 1962. Effects of status, type of frustration, and aggression on vascular processes. *J Abnorm Soc Psychol* 65:232–237.
- Hubbard J, Parker E, Ramsden S, Flanagan K, Relyea N, Dearing K, et al. 2004. The relations among observational, physiological, and self-report measures of children's anger. *Soc Dev* 13:14–39.
- Huesmann LR. 1998. The role of social information processing and cognitive schemas in the acquisition and maintenance of habitual aggressive behavior. In: Geen RG, Donnerstein E, editors. *Human aggression: Theories, research, and implications for policy*. New York: Academic Press. pp 73–109.
- Izard C. 1991. *The psychology of emotions*. New York: Plenum.
- Johnson-Laird P, Oatley K. 1989. The language of emotions: An analysis of a semantic field. *Cogn Emot* 3:81–123.
- Keltner D, Ellsworth P, Edwards K. 1993. Beyond simple pessimism: Effects of sadness and anger on social perception. *J Pers Soc Psychol* 64:740–752.
- Kim J, Deater-Deckard K. 2011. Dynamic changes in anger, externalizing and internalizing problems: Attention and regulation. *J Child Psychol Psychiat* 52:156–166.
- Krieglmeyer R, Wittstadt D, Strack F. 2009. How attribution influences aggression: Answers to an old question by using an implicit measure of anger. *J Exp Soc Psychol* 45:379–385.
- Lang P, Davis M. 2006. Emotion, motivation, and the brain: Reflex foundations in animal and human research. In: Anders S, Ende G, Junghofer M, Kissler J, Wildgruber D, editors. *Progress in brain research*. Vol. 156. New York: Elsevier. pp 3–28.
- Leventhal H. 1984. A Perceptual-motor theory of emotion. In: Berkowitz L, editor. *Advances in experimental social psychology*. Vol. 17. New York: Academic Press. pp 117–182.
- Mauss I, Cook C, Gross J. 2007a. Automatic emotion regulation during anger provocation. *J Exp Soc Psychol* 43:698–711.
- Mauss I, Cook C, Cheng J, Gross J. 2007b. Individual differences in cognitive reappraisal: Experiential and physiological responses to an anger provocation. *Int J Psychophysiol* 66:116–124.
- Miller N. 1948. Theory and experiment relating psychoanalytic displacement to stimulus–response generalization. *J Abnorm Soc Psychol* 43:155–178.
- Muraven M, Tice D, Baumeister R. 1998. Self-control as a limited resource: Regulatory depletion patterns. *J Pers Soc Psychol* 74:774–789.
- Ortony A, Clore G, Collins A. 1988. *The cognitive structure of emotions*. Cambridge, UK: Cambridge University Press.
- Pennebaker J. 1989. Confession, inhibition, and disease. In: Berkowitz L, editor. *Advances in experimental social psychology*. Vol. 22. San Diego, CA: Academic Press. pp 211–244.
- Perez-Albeniz A, De Paul J. 2005. Empathy in individuals at risk for child physical abuse: The effects of victim's pain cues on aggression. *Aggr Behav* 31:336–349.
- Potegal M, Stemmler G. 2010. Constructing a neurology of anger. In: Potegal M, Stemmler G, Spielberger C, editors. *International handbook of anger*. New York: Springer. pp 39–59.
- Ray R, Wilhelm F, Gross J. 2008. All in the mind's eye? Anger rumination and reappraisal. *J Pers Soc Psychol* 94:133–145.
- Richards J. 2004. The cognitive consequences of concealing feelings. *Curr Dir Psychol Sci* 13:131–134.
- Richards J, Gross J. 2000. Emotion regulation and memory: The cognitive costs of keeping one's cool. *J Pers Soc Psychol* 79:416–424.
- Roseman I, Wiest C, Swartz T. 1994. Phenomenology, behaviors, and goals differentiate discrete emotions. *J Pers Soc Psychol* 67:206–221.

- Russell J, Fehr B. 1994. Fuzzy concepts in a fuzzy hierarchy: Varieties of anger. *J Pers Soc Psychol* 67:186–205.
- Scherer K, 1984. Emotion as a multi-component process: A model and some cross-cultural data. In: Shaver P, editor. *Review of personality and social psychology. Emotions, relationships, and health*. Vol. 5. Beverly Hills, CA: Sage. pp 37–63.
- Schneider W, Shiffrin R. 1977. Controlled and automatic human information processing. I. Detection, search, and attention. *Psychol Rev* 84:1–66.
- Shaver P, Schwartz J, Kirson D, O'Connor, C. 1987. Emotion knowledge: Further exploration of a prototype approach. *J Pers Soc Psychol* 52:1061–1086.
- Sheppes G, Gross J. 2011. Is timing everything? Temporal considerations in emotion regulation. *Pers Soc Psychol Rev* 15:319–331.
- Solomon R. 1993. The Philosophy of emotions. In: Lewis M, Haviland J, editors. *Handbook of emotions*. New York: Guilford. pp 3–15.
- Spielberger C, Reheiser E. 2010. The nature and measurement of anger. In: Potegal M, Stemmler G, Spielberger C, editors. *International handbook of anger*. New York: Springer. pp 403–412.
- Spielberger C, Sydeman S. 1994. State-Trait Anxiety Inventory and State-Trait Anger Expression Inventory. In: Maruish M, editor. *The use of psychological tests for treatment planning and outcome assessment*. Hillsdale, NJ: Erlbaum. pp 292–321.
- Stemmler G. 2010. Somatovisceral activation during anger. In: Potegal M, Stemmler G, Spielberger C, editors. *International handbook of anger*. New York: Springer. pp 103–121.
- Verona E, Sullivan E. 2008. Emotional catharsis and aggression revisited: Heart rate reduction following aggressive responding. *Emotion* 8:331–340.
- Vohs K, Baumeister R, Schmeichel B, Twenge J, Nelson N, Tice D. 2008. Making choices impairs subsequent self-control: A limited resource account of decision-making, self-regulation, and active initiative. *J Pers Soc Psychol* 94:883–898.
- Wegner D, Erber R, Zanakos S. 1993. Ironic processes in the mental control of mood and mood-related thought. *J Pers Soc Psychol* 65:1093–1104.
- Wranik T, Scherer K. 2010. Why do I get Angry? A componential appraisal approach. In: Potegal M, Stemmler G, Spielberger C, editors. *International handbook of anger*. New York: Springer. pp 243–266.

Copyright of Aggressive Behavior is the property of John Wiley & Sons, Inc. and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.