Chapter 8

Does emotion regulation occur only inside people's heads? Towards a situated cognition analysis of emotion-regulatory dynamics

In "Emotion Regulation: Current Status and Prospects", Gross (this issue) reviews the state of the art in modern emotion regulation research and presents a new model of emotion regulation. The new model directly builds upon a highly influential earlier process model (Gross, 1998, 2001), which addressed how people may strategically direct their emotion-regulatory efforts within the cycle of emotion generation. However, the extended process model goes considerably beyond the original process model, by analyzing the complete dynamics of emotion regulation as it unravels over time: How people identify appropriate opportunities for emotion regulation; how people choose between different emotion-regulatory strategies; and, finally, whether people maintain a chosen strategy, switch between strategies, or decide to stop regulating their emotions.

We applaud the extended process model (Gross, this issue), as part of a more general push towards more dynamic conceptions of emotion regulation (Aldao, 2013; Bonnanno & Burton, 2013; Sheppes & Levin, 2013; Webb, Schweiger Gallo, Miles, Gollwitzer, & Sheeran, 2012). At the same time, we feel that the field still has a long way to go before it can provide a satisfactory account of people's emotion-regulatory dynamics. The extended process model and its conceptual cousins maintain that emotion regulation is driven by mental representations like goals and "valuation systems" (Gross, this issue). In our view, such static representations do not adequately explain the dynamic nature of emotion regulation. To tackle this problem, we propose a situated cognition approach, which treats emotion regulation as an activity that emerges dynamically from people's interactions with their environment.

Emotion Regulation as Situated Cognition

Researchers have traditionally portrayed emotion regulation as a process that occurs almost entirely inside people's heads. Within this conception, a central role is given to relatively static mental representations that are decoupled from immediate action. Particularly widespread is the idea that emotion regulation is guided by explicit, linguistically verbalizable goals. For instance, Gross (this issue, p. 8) states that, "The defining feature of emotion regulation is the *activation of a goal to influence the emotion trajectory*". Similar notions can be found throughout other contemporary accounts of emotion regulation processes (e.g., Koole, 2009; Mauss & Tamir, 2014; Sheppes, 2014). The extended process model (Gross, this issue) takes this general approach a step further by proposing that emotion regulation goals are part of a set of hierarchically ordered valuation systems that compute "what is good for me" versus "what is bad for me", based on "the juxtaposition of a representation of the world with a representation of a desired state of the world (a goal or target state)" (Gross, this issue, p. 19). Valuations thus provide a common representational language that guides and directs all of people's emotion regulatory activities.

A fundamental shortcoming of representation-driven models of emotion regulation is that such models do not consider the emergent qualities of emotion regulation that arise from people's dynamic interactions with the environment. As Vallacher and Jackson (2009, p. 1226) pointed out, "…the interaction among different psychological processes and environmental factors is not simply a computational product of these

elements, but rather represents an emergent phenomenon with properties of its own that cannot be reduced to the component elements." The importance of dynamically emerging processes is increasingly recognized in social and personality psychology (Vallacher & Nowak, 2007), where emergence has been investigated in such domains as self-valuation (Nowak, Vallacher, Tesser, & Borkowski, 2000), personality functioning (Shoda, LeeTiernan, & Mischel, 2002), social conflict (Vallacher, Coleman, Nowak, & Bui-Wrosinska, 2010), and emotion (Johnson & Nowak, 2002; Kuppens, Oravecs, & Tuerlinckx, 2010). Building and extending this work, we suggest that emergence is also vital to understanding the dynamics of emotion regulation.

To readers not familiar with the principle, the notion of emergence may be difficult to assimilate, even to the point of sounding esoteric. Nevertheless, there are countless mundane phenomena that emerge dynamically from the interactions between agents and environments, rather than a single agent acting alone. Among the most straightforward examples are everyday social interactions. Let's say that you are gossiping with a friend at a coffee shop. Because the two of you are continually chatting and responding to each other, your gossiping session cannot be reduced to the knowledge that each of you holds separately. Indeed, the juiciest bits may only arise when you combine what each of you knows about your mutual acquaintances. Such emergent phenomena are pervasive in social life, even when social interactions are highly structured, such as dining at a restaurant, sports games, or theatrical performances (Smith & Semin, 2004, 2007).

Dynamic social situations form the backdrop of the majority of people's emotion-regulatory activities. Such dynamic social situations are constantly changing, often in unpredictable ways. This means that emotion regulation would be poorly served by static goals (or "valuations") that are decoupled from the ongoing social situation. For instance, if your gossiping friend makes an insensitive remark that hurts your feelings, you have precious little time to compute the elaborate mental representations that specify whether you need to regulate your emotions, which strategies you could take, and how you might implement these strategies, as the extended process model (Gross, this issue) supposes. Indeed, by the time you are done with all this representational activity, the conversation is likely to have moved to a different topic, so that you can start all over again. To keep yourself from lagging behind each conversational turn, it would be more practical for you to be able to regulate your emotions on the fly, in the spur of the moment.

How may people flexibly attune their emotion-regulatory dynamics to situational demands without relying on static mental representations such as goals or valuation systems? The answer may be found by adopting a situated cognition approach to emotion regulation. Situated cognition approaches have surfaced across diverse areas of psychology and cognitive science (e.g., Barsalou, 2007; Clark, 1997; Glenberg, Witt, & Metcalfe, 2013; Marsh, Johnston, Richardson, & Smith, 2009; Oyserman, 2011; Robbins & Ayede, 2009; Schwarz, 2002; Smith & Semin, 2004, 2007). Although there are variations in specific emphases, theorists working from a situated cognition perspective generally assume that cognition arises from the dynamic interplay between the person and affordances of the situation. Because the world is ever changing, people do not

waste valuable time and resources by incessantly building up, maintaining, and revising mental representations. Such mental representations are bound to be insufficiently detailed and slow people down unnecessarily. Instead, people rely on their immediate sensory-motor interactions with the environment to regulate their actions.

A situated cognition perspective seems potentially helpful in elucidating the dynamics of emotion regulation. Before we can consider how this might work, however, we need to take a step back to reconsider our definition of emotion regulation. It is currently common among researchers to define emotion regulation as a goal-directed activity. Such a definition clearly jibes with a situated cognition perspective, because it implies that emotion regulation is always and inherently guided by a mental representation (i.e., a goal). Fortunately, it is possible to define emotion regulation without a priori committing to a representation-driven meta-theory. In previous work, we have defined emotion regulation as the set of processes that determines the offset of an activated emotional response (Koole, 2009). The offset of an emotional response can be achieved either with or without the help of abstract goals. Thus defining emotion regulation opens the door to a situated cognition analysis.

Emotion-Regulatory Affordances

From a situated cognition perspective, people are not in the business of constructing elaborate mental models of reality. Instead, people perceive their environment in terms of the possibilities for the kinds of actions that people want to pursue. These functional features of the environment are termed affordances (Gibson, 1979). Unlike "valuations" (Gross, this issue), affordances do not solely exist inside people's minds. Indeed, an affordance is not a construction by an individual person, but rather has a physical reality that exists in the person's relationship with the environment. Affordances reflect people's actual fit with their world, rather than subjective evaluations of "what is good for me" versus "what is bad for me".

Each type of activity has its own set of affordances that come with it. Thus, there are also affordances that are specific to emotion regulation. Whenever people want to regulate their emotions, they should scan the environment particularly for emotion-regulatory affordances. Although each environment may be associated with a unique set of affordances for emotion regulation, we broadly distinguish between affordances that stem from the body, tools, and other people.

Bodily Affordances

A first class of emotion-regulatory affordances arises from people's own body. The architecture of the body necessarily provides the interface between the acting person and the environment. Moreover, emotions are fundamentally embodied, such that even perceiving and thinking about emotion involve perceptual, somato-visceral, and motoric re-experiencing of the relevant emotion (Niedenthal, 2007). From a situated cognition perspective, affordances of the body are therefore of vital significance in supporting emotion-regulatory activities. This stands in contrast to traditional approaches

(Gross, 2001), which suggested that changing bodily expressions of emotion is a generally ineffective or even maladaptive form of emotion regulation. These traditional views may have obscured the significant ways in which the body can contribute to successful emotion regulation (see Koole, 2009, for a further discussion of this issue).

We have recently begun a program of research that explicitly looks into potentially adaptive forms of embodied emotion regulation. In one set of studies, we examined the effects of stooped versus straight seating postures (Veenstra, Schneider, & Koole, 2016). A stooped posture is associated with negative feelings and low status, and a straight seating posture is associated with positive feelings and high status (Stepper & Strack, 1993). We therefore reasoned that down-regulation of negative emotion would be harder for people in a stooped rather than a straight seating posture. This prediction was confirmed across three experiments. These findings thus highlight the significance of embodied processes in emotion regulation. Additionally, and contrary to prior suggestions (Gross, 2001), our findings suggest that changing emotional expressions (i.e, one's posture) can be an effective way to regulate one's emotions. Notably, debriefings indicated that participants in our study were not aware of the connection between their posture and their negative mood. Bodily affordances such as seating posture may thus implicitly regulate people's emotional states (for more on implicit emotion regulation, see Koole & Rothermund, 2011).

Beyond implicit or automatic processes, bodily affordances may also direct more effortful forms of emotion regulation. Some of our recent studies on anger management illuminate how this might occur (Veenstra, Schneider, Dillon, Domachowska, Bushman, & Koole, unpublished results, Chapter4). In these studies, we were particularly interested in people high in trait anger, who normally display a lack of restraint in dealing with their angry and aggressive impulses (Wilkowski & Robinson, 2008). In a first study, we observed that people high in trait anger display a stronger tendency to approach anger-relevant situations compared to people low in trait anger. Within the motivation literature, it is long known that behavioral inhibition arises when there is a conflict between approach and avoidance tendencies (Corr, 2013). We therefore reasoned that activating avoidance tendencies would promote anger management among people high in trait anger. Subsequent studies revealed indeed that asking participants to make avoidance movement leads to reduced anger and aggression in provocative situations among people with high trait anger. The latter effect does not occur when participants are first depleted by an effortful task, suggesting that avoidance motivation triggered effortful inhibition among people high in trait anger. Bodily affordances may thus shape both effortful and automatic forms of emotion regulation.

Tool Affordances

From a situated cognition perspective, emotion regulation is an activity that is distributed across brains and whatever people might bring into the environment. A second set of affordances thus consists of various kinds of tools and artifacts that people may recruit in emotion regulation. Tool use has received only scant attention in traditional approaches to emotion-regulation, presumably because these were only concerned with intra-psychic processes. Nevertheless, in everyday life, people make

frequent use of external instruments to improve their moods. For instance, people may take a hot shower when they feel lonely (Bargh & Shalev, 2012, 2014), cuddle a teddy bear when they feel afraid (Koole, Tjew A Sin, & Schneider, 2013), or treat themselves to a nice gift to lift their spirits (Kemp & Kopp, 2011). Having access to these various artifacts therefore greatly expands people's capability for managing their emotions.

Among the most powerful tools that people have for emotion regulation is language. Language affords people with access to the emotion knowledge that has accumulated within a linguistic community. Simply articulating how one feels can already help people to come to terms with their emotions, as shown by research on affect labeling (Kircanski, Lieberman, & Craske, 2012; Lieberman et al., 2007; Lieberman, Inagaki, Tabibnia, & Crockett, 2011). Conversely, alexithymic people, who have trouble talking about their emotions, display notable emotion regulation deficits (Samur et al., 2013). Other benefits of language may derive from the provision of metaphors and other conceptual tools that allow people to better understand and predict their emotional reactions (Kövecses, 2003; Lakoff & Johnson, 1980; IJzerman & Koole, 2011). Moreover, people can construct linguistic narratives, which help people to make sense of an emotional episode. Expressing one's feelings through writing may facilitate the cognitive structuring of emotional experiences (Pennebaker & Chung, 2007). Being able to write thus extends the affordances of language as a tool for emotion regulation.

Social Affordances

A final set of affordances relates to the emotion-regulatory significance of other people. Dating back at least to the work of Bowlby (1969), researchers have devoted considerable attention to the social regulation of emotion. For instance, developmental researchers have studied how caregivers may regulate children's emotional states (e.g., Calkins & Hill, 2007), and there is an extensive literature showing that social support is a key resource in coping with stress and adversity (e.g., Feeny & Collins, 2014). However, the self-regulation of emotion has traditionally been treated as more or less independent of the social regulation of emotion. All too often, the emotion regulating person is cast as the "Lone Ranger", or as "man against the elements" (Dunahoo, Hobfoll, Monnier, Hulsizer, & Johnson 1998; Rimé, 2009).

From a situated cognition perspective, it seems implausible that self-regulation of emotion would be completely divorced from the social context. Instead, self-regulation of emotion is likely to be predicated or "scaffolded" on social processes (Williams, Huang, & Bargh, 2009). For instance, when people want to recover from a negative emotional episode, they may do so by turning to others who can cheer them up. One way in which people may accomplish this is by selectively attending to smiling faces (Koole & Jostmann, 2004). Such selective attention to positive social stimuli under stressful conditions is found especially among resilient people, for instance, people scoring high on action orientation (Koole & Jostmann, 2004) or high on self-esteem (DeWall et al., 2011). An important key to successful self-regulation of emotion may thus lie in the strategic employment of social emotion regulation.

In short, a situated cognition perspective implies that the social regulation of emotion should be intertwined with the self-regulation of emotion. Consistent with this,

Rimé (2009) has observed that social sharing of emotional episodes may not only provide emotional relief, but may also stimulate people to cognitively reprocess their experiences, "prompting [people] to abandon their frustrated goals, reorganize their hierarchy of motives, accommodate their models and schemas, re-create meaning, and reframe or re-appraise the episode" (p. 75). Furthermore, newly found meanings may become consolidated when they become part of a narrative that is shared by others in one's social-cultural group (Hardin & Higgins, 1996). Social regulation of emotion may thus facilitate the meaning-making activities that allow for the self-regulation of emotion. In these and many other ways, the social context provides affordances for emotion regulation.

Emotion-Regulatory Constraints

From a situated cognition perspective, people flexibly enact emotion regulation on the basis of the specific affordances of the situation. However, this does not mean that the dynamics of emotion regulation are necessarily chaotic or haphazard. Theory and research on dynamical systems has shown that complex, mutually coordinated behavior may be achieved through self-organization, a global order that emerges through repeated interactions between agents that are each following simple, locally determined rules (Vallacher & Nowak, 2007). For instance, termites can build complex structures without any master plan (Kugler & Turvey, 1987; see Marsh et al., 2009). Likewise, robots are capable of complex sequences of adaptive behavior without the supervision of central executive systems or even a common symbolic code (Clark, 1997).

Applied to emotion regulation, the notion of self-organization suggests that, the situated dynamics of people's emotion-regulatory efforts may over time coalesce into coherent patterns. Once such a pattern is established, it constrains people's subsequent interactions with the environment. Due to these constraints, the relevant pattern in emotion regulation is likely to be maintained over time, even when there are incremental changes in the environment. The self-organization of situated emotion-regulatory activities thus promotes stability in the system. Notably, this stability is an emergent, higher-order phenomenon that arises from people's interactions with the environment. The order that is imposed by self-organization of emotion-regulatory dynamics has no need for deliberate emotion regulation choice (Sheppes, in press) or symbolic valuation process (Gross, this issue).

Self-Organization in Personality Functioning

Self-organizing patterns in emotion-regulation may form important building blocks of personality functioning. Whereas personality has been traditionally conceived in terms of global traits, recent advances in modern personality science have moved towards more dynamic, situated conceptions of personality (Mischel & Shoda, 1995). This theoretical shift is inspired by the growing realization that consistency in personality functioning lies not so much across situations, but rather in "distinctive but stable patterns of if… then … situation-behavior relations that form contextualized, psychologically meaningful personality signatures (e.g., she does *A* when *X*, but *B* when

Y"; Mischel & Shoda, 2010, p. 154). From the present perspective, a fair share of these personality signatures may reflect emerging, self-organizing patterns in people's emotion-regulatory dynamics.

The situated cognition approach to personality is highly compatible with previously discussed studies on trait anger (Veenstra et al., unpublished results, Chapter 4). In the prior literature, people high in trait anger have been portrayed as "hotheads" who are consistently less prone to control their temper than people low in trait anger (e.g., Wilkowski & Robinson, 2008). However, our research shows that this typology is too simple. Even then they are provoked, people high in trait anger do not always respond with more anger and aggression than their counterparts who are low in trait anger. Rather, we find that this difference only occurs in anger-provoking situations in which approach tendencies are pre-potent. In anger-provoking situations where avoidance tendencies have been activated, people high in trait anger tend to display similar or less anger and aggression compared to people low in trait anger. Thus, without taking the situation into account, it is impossible to say whether people's level of trait anger will predict anger management processes. Individual differences in trait anger are therefore only meaningful when they are considered in conjunction with the situational context.

Self-Organization in Social Life

Moving beyond individuals as the unit of analysis, self-organizing patterns in emotion-regulatory dynamics may also emerge from people's social interactions. In many settings, self-organizing patterns may become manifested as tacit social norms regarding appropriate emotional behavior. For instance, Erber and colleagues have observed that people who expect to interact with strangers prefer to stay "cool and collected", by neutralizing any negative and positive feelings that they entertain (Erber, Wegner, & Therriault, 1996). This neutralizing tendency does not occur for romantic couples or accepting partners, but is specific to the expectation of having to interact with strangers (see Erber & Erber, 2000).

The influence of social norms on emotion regulation that was observed by Erber and Erber (2000) may be seen as part of a dynamic social coordination process. People rapidly synchronize their own activities with other people's activities (e.g., van Ulzen et al., 2008). Such social coordination processes may also extend to emotion regulation. When dealing with strangers, however, people do not know a priori which emotional state they should be synchronizing towards. Being optimally sensitive to the social situation thus means that people should move towards a neutral stance, which affords maximal flexibility for emotional synchronization during subsequent interactions (for more on such "counter-regulation" processes, see Schwager & Rothermund, 2013a,b, 2014). Over time, this neutralization tendency may give rise to an emergent social norm to remain neutral when one is among strangers.

The hallmark of dynamic self-organizing systems is formed by mutually recursive influences between agents. Various studies indeed point to mutually recursive influences of social interactions on emotion regulation. For instance, feelings of romantic attraction are enhanced when these are reciprocated (Aron et al., 1989). Conversely, people

habituate less to painful stimuli when they believe that the pain was intentionally inflicted upon them (Gray & Wegner, 2008). Such mutually recursive processes may automatically and implicitly regulate people's emotions (Egan, Hirt, & Karpen, 2012; Koranyi & Rothermund, 2012). Taken together, there is converging support for the notion of emergent self-organizing patterns in emotion regulation, in line with a situated cognition approach.

Conclusions and Outlook

What explains the waxing and waning of people's emotion-regulatory activities over time? According to the extended process model (Gross, this issue), people's emotion-regulatory dynamics are governed by an array of hierarchically nested valuation systems that decide for people whether, how, and when to engage in emotion regulation. By placing emotion-regulatory dynamics wholly inside people's heads, the extended process model does not address the emergent qualities of emotion regulation that arise from people's interactions with the environment. To fill this conceptual gap, we have advanced a situated cognition approach to emotion regulation. According to a situated cognition approach, emotion regulation dynamics emerge from the interplay between the person and affordances of the situation. In line with this approach, we provided several empirical examples that support the underlying principles of a situated cognition approach to emotion regulation.

A situated cognition approach to emotion regulation emphasizes bottom-up control processes like emergence and self-organization. In this regard, the approach represents a radical departure from traditional models of emotion regulation, which have emphasized top-down control by goals or intentions. However, we do not view self-organization as inherently irreconcilable with top-down, goal-directed control (see also Carver & Scheier, 2002, for a discussion of these issues). First, self-organization may explain dynamic shifts in people's emotion-regulatory goals or strategies, even when these goals and strategies themselves are implemented through top-down control. Second, it is conceivable that self-organization and top-down control function as two different control modes, which are each involved in emotion regulation. Dual-processing theories are widespread in contemporary psychology (e.g., Evans & Stanovich, 2013; Smith & DeCoster, 2000; Strack & Deutsch, 2004), and have recently been extended to emotion regulation (Gyurak, Gross, & Etkin, 2011; Koole & Rothermund, 2011). In sum, a situated cognition approach complements rather than contradicts traditional goal-directed models of emotion regulation.

In the brief space of this article, we hope to have conveyed some of the great theoretical promise of a situated cognition approach to emotion regulation. A situated cognitive approach invites researchers to think more about the emergent qualities of emotion regulation as it unfolds dynamically over time and across situations. Emotion regulation, in this view, occurs not just inside people's heads, but rather is jointly enacted through the affordances of the brain, body and environment.