

Chapter 1: Theoretical Introduction

Regulating Emotions

Summary: This chapter is aimed at presenting a selection of research themes and studies from emotion regulation literature which are relevant to the present study. We will start by discussing the concept of emotion regulation itself, the definitions provided by different theorists and its boundaries with the concept of coping. Secondly, the chapter will take into consideration the process model of emotion as it represents one of the most recent operational models provided to investigate the emotion regulation processes. Finally, the chapter will focus on reappraisal strategy and cognitive change as a form of emotion regulation. We will conclude this theoretical introduction summarizing the major critical issues faced by our studies.

Although we commonly use to think about emotions conceiving them as sudden, irrational and uncontrollable events, psychological research has highlighted that human beings are able to regulate their emotions so that many of the behavioral expressions occurring during interactions do not directly reflect internal emotional processes but are actually controlled by adaptive *regulation processes* (Kaiser & Wehrle, 2001). Emotion regulation currently is a major theme of investigation, though research has started to focus specifically on this process only in the last decades. Research on this topic originated in developmental psychology (Gaensbauer, 1982; Campos, Barrett, Lamb, Goldsmith, & Stenberg, 1983) and since then it has been on the rise in both child and adult literatures (Campos, Campos, & Barrett, 1989; Gross, 1998; Eisenberg, 2002; Kopp & Neufeld, 2003; John & Gross, 2004; Baumeister & Vohs, 2004; Eisenberg, Champion, & Ma, 2004; Gross, 2007).

A long-standing view in psychological theories has conceived emotions as disruptive, dysfunctional and irrational events which break into life interrupting or interfering with every other ongoing activity (Young, 1943). On the other hand contemporary research has underlined

emotion's positive role in adaptation grounding a functional approach to the study of emotional processes. According to this view, emotions are conceived as helpful mediators in the relationship between the organism and the environment for the maintenance of the organism's well being (Scherer, 1984; Levenson 1994). For example, emotions may prepare the individual for rapid motor responses (Frijda, 1986) and for coping with the eliciting situation (Lazarus, 1991); they may facilitate decision making (Damasio, 1994) and influence learning and memory. Moreover, emotions are important social mediators which provide information about behavioral intentions (Ekman, Friesen, & Ellsworth, 1972; Fridlund, 1994) and contribute to the ability to flexibly regulate complex social behavior (Lazarus, 2006; Averill, 1980).

Although the functional approach accounts for the adaptive role of emotions, it does not imply that emotional responses are always appropriate to the situations individuals face and to the physical/social environment they act in (Gross, 1999). Emotion regulation is thus a pervading characteristic of our lives (Morris & Reilly, 1987): we need to reduce or increase our emotions to subserve the most different goals (Gross, 1998b), such as hiding delusion for a gift we actually don't like, reducing anger to maintain and continue a conversation, etc. According to John and Gross (2004), the challenge of regulation consists in enhancing the helpful and adaptive features of emotions and limit their disruptive ones. «At such times, our emotional responses may do far more harm than good. When our emotions seem to be ill-matched to a given situation, we frequently try to regulate our emotional responses so that they better serve our goals» (Gross, 2002).

1.1. What is emotion regulation?

1.1.1. Definitions

Many different definitions of emotion regulation have been formulated each focusing on different aspects of this process. According to Gross (1998b), *emotion regulation* refers to «the processes by which individuals influence *which* emotions they have, *when* they have them, and

how they experience and express these emotions. Emotion regulatory processes may be automatic or controlled, conscious or unconscious, and may have their effects at one or more points in the emotion generative process». As emotions are complex processes that unfold over time, several authors have underlined the importance of the temporal dimension suggesting that emotion regulation involves changes in «emotion dynamics» (Thompson, 1990; Gross, 1998b) or «affective chronometry», i.e. the temporal dynamics of the affective responding (Davidson, 1998): the latency, rise time, magnitude, duration, and offset of responses in behavioral, experiential, or physiological response domains. Moreover, as emotions are multi-componential phenomena, emotion regulation also involves changes in one or more response subsystem (physiological, expressive, experiential) and in how those response components are related one to another (Gross, 2002).

Concerning emotion regulation functions and mechanisms, Davidson (1998) has stated that «emotion regulation consists in broad range of processes that aim at amplifying, attenuating, or maintaining the strength of emotional reactions. For example, included among these processes are certain features of attention which regulate the extent to which an organism can be distracted from a potentially aversive stimulus (Derryberry & Reed, 1996; 2002) or self-generated imagery to replace emotions that are unwanted, with more desirable imagery scripts». According to Thompson (1994), emotion regulation may be defined as «the extrinsic and intrinsic processes responsible for monitoring, evaluating, and modifying emotional reactions, especially their intensive and temporal features, to achieve one's goals». Eisenberg and Spinrad (2004) define emotion regulation as «the process of initiating, avoiding, inhibiting, maintaining, or modulating the occurrence, form, intensity, or duration of internal feeling states, emotion-related physiological, attentional processes, motivational states, and/or the behavioral concomitants of emotion in the service of accomplishing affect-related biological or social adaptation or achieving individual goals».

1.1.2. Two-factor vs. unitary models: are emotion and emotion regulation separable?

The importance of all these aspects to a definition of emotion regulation is a matter of large debate (see the special section of *Child Development*, 2004) and different models have been confronted. One of the most debated theoretical challenge deals with the central question of how a researcher can tell when emotion is regulated and whether emotion regulation has taken place: «[...] emotion cannot be inferred unless the situation as perceived by the individual should have elicited a different emotion response profile than the one that was shown. Emotion regulation thus requires a formidable level of certainty about emotion in its unregulated state» (Gross, 1999).

In their commentary, Campos, Frankel and Camras (2004) have discussed about a two-factor model set against a one-factor alternative. According to the authors, the former is a simple and intuitive model as it implies the existence of two distinct kinds of processes: one related to the generation of emotion, and a second one coming after the generated emotion and involving its regulation and control. In this perspective, Cole et al. (2004) stated that «emotion regulation refers to changes associated with activated emotions» and recommended the use of working definitions to guide research and methods able to provide inference that (a) first a certain emotion was elicited and then (b) regulatory strategies independently occurred to change the elicited emotional state.

On the contrary, in the one factor model, emotion regulatory processes are conceived as tightly linked to emotion generative processes. According to some theorists, emotion regulation is best seen as part of emotion (Frijda, 1986), as, after all, adult emotions are almost always regulated (Tomkins, 1984). According to Campos et al. (2004) there is no «pure» emotion, that is an emotion that exists in an «unregulated manner» (first factor in the two-step theory) and even if such phenomena as pure emotions were actually present, «no empirical study has ever convincingly presented coherent facial, vocal, gestural, physiological, or cerebral indexes that approximate a 1:1 relation to an emotional state, that is coherent indications that could serve as its operational definition». For those reason,

the authors did not accept the assumption of an ontological difference between two distinct processes – a generative and a subsequent regulatory one – but rather suggested a unitary model, which is able to account for how emotion and its regulation are «typically indissociable» and concurrent processes aimed at effectively adapting to the problems encountered in the world. In this view, every phase of the emotion process is under the intervention of regulation (Frijda, 1986; Manstead & Fisher, 2001): regulation can come first the elicitation of an emotion, in some cases prevent the manifestation of an emotion, or in other cases change its quality.

Davidson, Jackson and Kalin (2000) have argued that the ability to regulate emotions is an important aspect of the plasticity in affective responding. In their contribute on emotion plasticity, context and regulation, these authors have suggested that it may be difficult to operate a rigorous distinction between the processes involved in the production of an emotion on one side from those responsible of its regulation on the other (Clore & Robinson, 2001). In fact, «because of their parallel processing in the brain, it is more likely that these two components of emotional responding correspond to at least partially overlapping processes: this fact poses a formidable challenge to those investigators who wish to obtain separate measures of emotion and regulation and to determine the influence of the latter on the former». In the same way, according to Davidson (1998): «we hold the view that regulatory processes are an intrinsic part of emotional behaviour and rarely does an emotion get generated in the absence of recruiting associated regulatory processes. For this reason, it is often conceptually difficult to distinguish sharply between where an emotion ends and regulation begins. Even more problematic is the methodological challenge of operationalising these different components in the stream of affective behavior».

Trying to face this complexity, Jackson, Malmstadt, Larson and Davidson (2000) have conducted a study aimed at the development of a paradigm to mark a sharp boundary between the processes of emotion and emotion regulation in time. In this experiment, participants were asked to inhibit, maintain or enhance their emotional responses to negative-

emotion-eliciting pictures. Two different measures of emotion were used: startle eye blink magnitude and electromyogram activity in the corrugator region (Lang, 1995). The instructions to participants to either maintain, enhance, or suppress the emotion that they were experiencing were presented 4 sec after the onset of a negative picture and - to achieve the crucial distinction between generated emotion and subsequent regulation - data were collected in the presence of the emotional stimulus both before and after the regulation instructions. Results showed that the instructions to suppress a negative emotional response led to decreased eye blink startle magnitude and corrugator activity, whereas the instructions to enhance similar responses led to increases in both measures (compared to the within-subject maintain condition).

As a conclusion to this debate, we report the comment of Gross (2007) who claimed that the conceptualization of emotion and emotion regulation in a two factor model does not necessarily imply the lack of recognition that the two phenomena are tightly connected and often occur at the same time in the same brain. In fact neuroscience evidence has showed that limbic centres that generate emotions and cortical centres that regulate them are bidirectional linked. However, such a distinction may have a practical and operational value and be useful to investigate basic processes and individual differences. The author also remarked the difficulty to obtain experimental evidence of emotion regulation and recommends the need to be cautious when inferring the existence of regulatory processes in a given context.

1.2. Precursors to the Contemporary Research about Emotion Regulation

Although theory and research on emotion regulation have started to come into view relatively recently, work on this topic did not emerge from a total theoretical emptiness (Eisenberg & Fisher, 2004). In his historical review of emotion regulation studies, Gross (1999) has distinguished between two main precursors to contemporary research concerning emotional control.

1.2.1. The Psychoanalytic tradition

According to this author, the first important historical antecedent to the current study of emotion regulation is the psychoanalytic tradition, which has studied the functioning of the so called *defense mechanisms*. More in detail, the psychoanalytic tradition has focused on the concept of anxiety, which may be considered as near to a sort of general negative affect or to negative emotional experiences in general (Erdelyi, 1993).

Psychoanalysis has differentiated two different types of anxiety regulation (Freud, 1959): (1) the first type concerns *reality-based* anxiety, which arises when the ego is overwhelmed by external situational demands (agoraphobia is a typical example). In this case, regulation aims at protecting the ego avoiding such situations, even though such avoiding strategy may determine long-term excessive behavioral constrictions and limitations. (2) The second type of anxiety regulation concerns *id-* and *superego-based* anxiety, which arises when strong internal impulses press for action and expression. In this case, anxiety regulation consists in preventing the expression of impulses that according to the ego judgment are likely to cause high levels of future anxiety. *Ego defense* is the general term given to processes that regulate these two types of anxiety as well as other painful negative affects (Paulhus, Fridhandler, & Hayes, 1997). Usually, these processes are not conscious and maladaptive phenomena such as reality distortion, behavioural impairment, energy consumption and unnecessary non-gratification of impulses are possible undesirable consequences (Fenichel, 1945; Freud, 1946; Haan, 1977; Vaillant, 1977).

Compared to this prior tradition, contemporary research is still concerned with regulation and reduction of negative and painful emotional experiences; however it has also widened its field of analysis to the world of positive emotions (Parrott, 1993). Moreover, although the study of maladaptive regulatory strategies is still considered as central to the understanding of psychopathology (Cicchetti, Ackerman, & Izard, 1995; Gross & Munoz, 1995), there is an increasing interest and investigation about normal functioning and the everyday use of control strategies (Gross, Richards, & John, 2006).

1.2.2. The stress and coping perspective

The second important precursor to contemporary emotion regulation research is the stress and coping tradition (Gross, 1998b; 1999). Although it has its roots in the former tradition, this approach is distinguished by a concern with adaptive and conscious coping processes, and by a focus on situational rather than person variables (Parker & Endler, 1994). «Stress» is a central and well-known concept. Within the category of stressful situations this tradition has comprised all negative, traumatic or challenging events which weigh against the individuals' resources. Stressful situation hence deserve a particular interest because human behavior may result deformed under their load: according to Seyle (1956), under stress organisms produce similar stereotyped psycho-physiological responses. Whereas early researchers focused on responses to physical challenges such as cold or crowding, later researchers soon expanded the focus of analysis to include psychological stressors, as for example public speaking or exams. The origin of contemporary coping research can be traced back to the publication of Richard Lazarus's book (1966), *Psychological Stress and the Coping Process*. In this book, Lazarus presented his new contextual approach to stress and coping (Folkman & Moskowitz, 2004).

1.2.2.1. To cope with negative and stressful events

Lazarus's formulation of coping theory went over the concept of defense belonging to the psychoanalytical tradition; in fact his approach was not characterized by an exclusive emphasis on pathology, but his interest was primary focused on the wider range of cognitive and behavioral responses common people rely on to manage distress and to face everyday problems. Lazarus's theory has stressed the role of *cognitive appraisal* in the individual's emotional response to a stressful situation and driven attention to the ways in which the person copes with such an appraised situation. «An appraisal of the requirements and the options for coping takes place at the very instant we recognize an emotion-relevant condition in an encounter with the world. In effect, coping and the appraisals that influence it mediate any emotions that are generated by the emotion process» (Folkman & Lazarus, 1988). In this view, it is this kind

of evaluation that determines which emotions are experienced and displayed in the interaction with the others. The study of coping should therefore go back to the cognitive processes by which external events are transformed into something significant for the individual as the starting point of the emotional response (Lazarus, 1966). According to Lazarus (2006, p.10) «we are constantly appraising – that is imputing relational meaning to our ongoing and changing relationships with others and the physical environment and it is meaning that defines and shapes our emotions». In this perspective, according to Lazarus' model, three different kinds of evaluation take place: (a) the *primary* appraisal, which consists of how the situation is evaluated; (b) the *secondary* appraisal, which deals with how the organism views its own capabilities and resources to respond; (c) and finally the *coping* process, which is how the organisms attempt to manage the relation with the environment that caused stress (Lazarus, 1991; Gross, 1999).

Coping is concerned with «our efforts to manage adaptational demands and the emotions they generate» (Lazarus, 2006, p.10) and is an integral feature of the emotion process (Lazarus, 2003). A widely accepted definition (Tennen et al., 2000) considers coping as corresponding to the «constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person» (Lazarus & Folkman, 1984, p.141). The coping process starts when individuals appraise that goals important to them have been damaged, lost, or threatened. This appraisal gives rise to negative emotions that may be intense. Coping responses – all thoughts and behaviours through which individuals manage the internal and external demands of stressful situations – are thus initiated in an emotional environment, and often one of the first coping tasks is to down-regulate negative emotions that may interfere with other problem-oriented forms of coping (Folkman & Moskowitz, 2004). In this perspective, it is not stress in itself that constitutes a threat to a person's overall well-being but how the individual copes with it. «Stress is a natural and expectable feature of living, but it also makes the coping process necessary» (Lazarus, 2006). As Lazarus has pointed out, crisis and difficulties may even involve a

reorganization of our lives and lead us to higher levels of satisfaction than before the crisis itself.

Starting from the 1970s and 1980s research on this topic has been developing and thousands of studies have been published (Somerfield & McCrae, 2000) so that coping has emerged as a distinct field of psychological investigation. A fundamental motivation to the coping study is the idea that – within a given culture – certain ways of coping are characterized by different levels of effectiveness to address stressful situations and hence to maintain the individual's emotional well-being, and that such information can be used in applicative interventions to help people to cope more effectively with the stress in their lives. If coping is effective, stress is likely to remain under control, whereas if coping is ineffective, stress may have damaging consequences for health, self-esteem and social functioning (Lazarus, 2006). However, determining the effectiveness of coping strategies still remains a challenging issue in coping research (Somerfield & McCrae, 2000).

According to the contextual approach, it has been argued that coping strategies are not inherently good or bad but the adaptive qualities of a coping strategy should be evaluated with respect to the specific stressful context or situation and its dynamic changing (Folkman & Moskowitz, 2003). This evaluation should take into account both the outcomes and the fit between strategy and kind of situation (illness, threat, loss, death, etc.). Possible outcomes of a coping strategy may be the resolution of the problem, stress reduction, return to pre-stress activities, well-being and self esteem maintenance, etc. (Zeidner & Saklofske, 1996). Wu et al. (1993) found that coping strategies that prove effective with respect to one outcome may nonetheless have negative consequences on another. In their study, physicians who coped by accepting responsibility for the mistake made constructive changes in their practice (problem-solving), but also experienced more distress. Moreover, still unresolved questions arise with respect to those chronic, inherently irresolvable conditions that characterize the stress many people are troubled by such as chronic illness, unemployment, and bereavement, and which are the most challenging in terms of coping (Folkman & Moskowitz, 2004; Mattlin et al. 1990).

Concerning the goodness of fit with the situation, empirical studies have suggested that an important feature to be considered is its controllability. Terry and Hynes (1998) made distinctions among problem- and emotion-focused kinds of coping in a study of women coping with a medical procedure (in vitro fertilization) which they considered uncontrollable. Direct attempts to manage the problem were related to poorer adjustment, whereas emotion-focused approach to coping was better related to positive outcomes. Escape, another form of emotion-focused coping, was not efficient.

1.2.2.2. Coping strategies

People's ability to adapt their coping behavior according to the situation characteristics is called coping flexibility and it involves the systematic use of a variety of strategies rather than the rigid application of a few ones (Folkman & Moskowitz, 2004; Lester et al. 1994). Coping strategies are many and researchers have generally clustered this remarkable number of responses under a few coping dimensions based on theoretical assumptions or factor analysis studies (Folkman & Moskowitz, 2004). One of the most wide-used distinction has stressed two major kinds of coping: *problem-focused coping*, which aims to address and solve the problem that is the cause of distress (e.g., making plans of action), and *emotion-focused coping*, which aims at reducing and managing the negative emotional experiences associated with the problem itself, as, for example, looking for emotional support (Folkman & Lazarus, 1980). Although negative situations may elicit both types of coping, problem-focused coping tends to predominate when people feel that something constructive can be done, whereas emotion-focused coping tends to predominate when people feel that the stressor is something that must be endured (Folkman & Lazarus, 1980; Carver, Scheier, & Weintraub, 1989). However, in a recent contribute, Lazarus (2006) claimed that the belief of problem- and emotion-focused coping as two independent strategies of coping should be abandoned: dealing with these two coping functions as separate and opposing is an epistemological mistake, because they actually complement each other in most stressful situations.

Coping is a multidimensional process which may be influenced by the environment on one side – that is by the type of stressors and situations – and by personality dispositions that affect the appraisal of stress and of one's own resources on the other. Coping may thus be viewed either as a process or as a personality trait: stability and change are two sides of the same coin. According to Lazarus (2006), when coping strategies change over time and circumstance, they must be thought of as a process (Folkman & Lazarus, 1985). When such strategies are relatively stable, they must be seen as traits or styles. «Coping style» is frequently used in coping literature to refer to a typical manner of facing a stressful situation and dealing with it (Folkman & Lazarus, 1980; 1985). According to this conceptualization, the coping style would be similar to a habit or usual approach an individual relies on when attempting to solve problematic situations.

The widespread interest has motivated the development of tools and questionnaires with which to measure and assess coping thoughts and behavior in specific stressful situations (Billings & Moos 1981, Folkman & Lazarus 1980, Pearlin & Schooler 1978; Endler & Parker, 1990). Most studies have focused on the development of self-report coping inventories, which are aimed at the assessment of general coping functions. Lazarus and Folkman (1988) have developed two widely used coping scales: the Ways of Coping Checklist and the Ways of Coping Questionnaire (WCQ). The WCQ enables the assessment of the 8 eight different dimensions: Confrontive coping, Distancing, Self-controlling, Self-controlling, Seeking social support, Accepting responsibility, Escape-avoidance, Planful problem solving, Positive reappraisal. Carver, Scheier and Weintraub (1989) have developed a 60-item coping scale called COPE (Coping Orientations to Problems Experienced). The COPE includes 15 scales and makes several distinctions within the overall categories of problem vs. emotion focused coping (Active coping, Planning, Suppression of competitive activities, Restraint coping, Seeking social support for instrumental reasons, Seeking social support for emotional reasons, Venting of emotions, Behavioral disengagement, Mental disengagement, Alcohol and drugs, Denial, Positive reinterpretation, Acceptance, Turning

to religion, Humor). The Coping Inventory for Stressful Situations (CISS) assesses Task vs. Emotion vs. Avoidance oriented Coping (Endler & Parker, 1994).

1.2.2.3. Coping and emotion regulation: where is the difference?

At this point the reader could ask where lies the difference between coping and emotion regulation and what kind of relationship exists between them. Emotion regulation researchers have borrowed heavily from the stress and coping tradition: the two concepts seem to have much in common and not all investigators agree in placing boundaries between them. For example, according to Folkman and Moskowitz (2004) «to the extent that coping is aimed at ameliorating negative emotions or promoting positive emotions, it falls under the rubric of emotion regulation» and «the work on emotion regulation adds to the coping literature by providing an in-depth look at the effects of some forms of emotion-focused types of coping. The forms of emotion regulation that Gross and colleagues are studying in the lab (*see* 1.3) can be considered emotion-focused coping because they are elicited in response to the depiction of disturbing, stressful events that the individual is unable to control or change». According to Eisenberg et al. (1997), both coping and emotion regulation can be classified under the larger category of self-regulation: coping includes the regulatory processes that occur in stressful contexts. Clore and Robinson (2001) stated that: «the difference becomes less clear if one considers that Lazarus and colleagues included the concept of emotion focused coping within their transactional framework. In emotion focused coping the person engages in cognitive and behavioral strategies to attempt to change his or her subjective state one can't help feeling that emotion regulation may be simply a new name for emotion focused coping».

However, according to Gross (1999) there are also important differences to be done. According to this author, coping is a broader category as it includes non-emotional actions to achieve non emotional goals (Scheier, Weintraub, & Carver, 1986) as well as actions taken to regulate emotions. Coping also differs from emotion regulation regarding

the unit of analysis which is typically longer – extended periods of hours, days rather than minutes or seconds. On the other side, the coping category does not entirely cover emotion regulation, which includes also processes that may or may not tax the individual's resources, as well as non-conscious processes not traditionally considered in the coping literature. Moreover, the coping process is prompted by negative emotion and happens after the occurrence of emotion itself, not prior, as it happens with some forms of emotion regulation (*see the process model of emotion*).

1.3. The process model of emotion

In his contribute to the study of emotion regulation, Gross (1998b; 1999; 2002) has suggested the operational value of referring to a consensual model of emotion generation to organize the large number of emotion regulatory strategies. To this purpose, this author has elaborated a *process model of emotion* (Gross, 1998a; Gross, 2001; John & Gross, 2004) based on a well-known conception of the emotion generative process according to which emotions are elicited and differentiated by cognitive *appraisals* (Arnold, 1960; Buck, 1985; Frijda, 1986; Izard, 1977; Lazarus, 1991; Plutchik, 1980; Scherer, 1984; Tomkins, 1984). A second root of the model is the explicit reference made to William James (1884, 1894) who conceived emotions as «adaptive behavioral and physiological response tendencies called forth directly by evolutionarily significant situations» (Gross, 1998b, p.272). According to this view of emotions, response tendencies do not correspond to predetermined reflex-based responses, but may be flexibly controlled. This means that though it's possible that individuals give them direct expression, it's more likely that people modulate response tendencies: in this perspective, differences between emotional tendencies and manifested reactions are the starting point to question about how, why, and when individuals might try to regulate their emotional responses (Gross, 1998b). As emotion unfolds over time, «emotion regulation strategies differ in when they have their primary impact on the emotion-generative process» (Gross, 2002, p.282).

Figure 1 shows a graphical representation of the model: emotional response tendencies are activated when internal or external events

(emotional cues) are evaluated as significant by the individual and they involve coordinated changes in multiple response systems, such as expressive behavior, physiological arousal and subjective experience (Scherer, 1984; Lang 1995). Therefore, emotion starts with a cognitive evaluation (*appraisal*): certain evaluations - see for example the Stimulus Evaluation Checks (SECs, Scherer, 1984) - trigger a coordinated set of response tendencies, which anyway do not necessary correspond to the overt emotional responses, because they may be modulated, and it's this modulation that gives final shape to the emotional reaction. In which way?

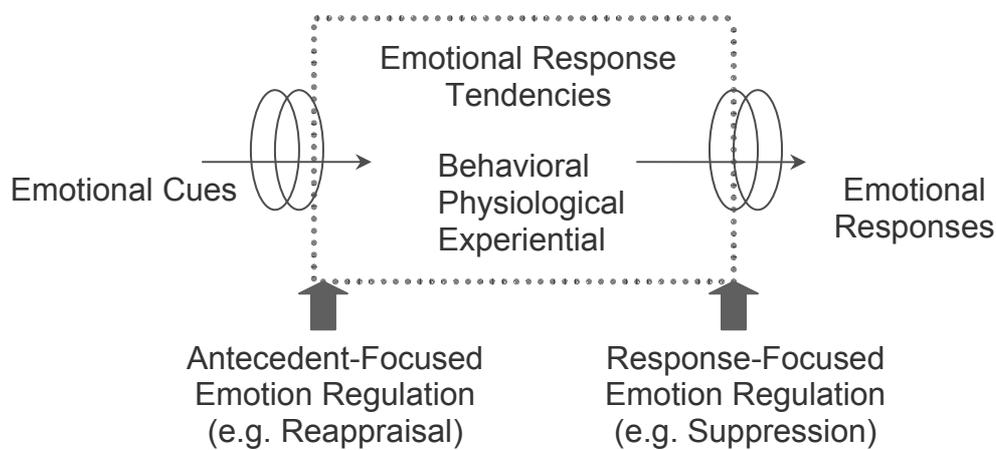


Figure 1: The process model of emotion (from Gross, 1998a)

According to Gross (1998a, p.225), «emotions might be regulated either by manipulating the input to the system (antecedent-focused emotion regulation) or by manipulating its output (response-focused regulation)». Antecedent-focused strategies include things we do very soon in the emotion generation process, that is before the complete activation of emotion response tendencies has changed our overt behavior and physiological responding. By contrast, response-focused strategies intervene later and refer to things we do once an emotion is already happening and after the response tendencies have already been generated. Within these two broad categories of emotion regulation, more subtle distinctions can be made (Frijda, 1986; Gross, 1999). Five different points may be identified in the emotion generative process where regulation strategies may intervene (Gross, 1998b):

-  First, regulatory strategies may act on the situational antecedent. The most «forward-thinking» strategy may be called *situation selection*. It refers to the attempts of approaching or avoiding certain people, places or things on the basis of their expected emotional impact (Gross, 2002). It corresponds to what Campos et al. (2004) and Eisenberg and Spinrad (2004) call «*nichepicking*». For example, a shy person may try to avoid social situations – such as to go out, to meet groups of people, to give a talk in front of many people, etc; people suffering airplane phobia choose not fly; thrill seekers try the most scaring rollercoaster and look for situations where risks abound. Therefore, this strategy involves taking choices that make it more or less probable to find oneself in a situation expected to elicit desirable or undesirable emotions. The adaptive use of situation selection involves the ability to evaluate the ratio between short-term benefits and long-term costs. In the example cited above, the immediate relief from the avoidance of scaring social situations may turn into long-term social isolation (Leary, 1986; Gross, Thompson, 2007). Sensation and risk seeking may lead to injury (Zuckerman, 1979).
-  A second kind of regulatory strategy is situation modification, which has also been referred to as *problem-focused coping* (Lazarus & Folkman, 1984; Gross, 2002). Compared to situation selection, it may intervene once one is in an emotion eliciting situation and it refers to all the attempts and actions aimed at modifying the external environment so as to reduce, increase or change its emotional impact.
-  Thirdly, «it also is possible to regulate emotions without actually changing the environment. Situations have many aspects, and attentional deployment refers to how individuals direct their attention within a given situation in order to influence their emotions» (Gross & Thompson, 2007). Two main strategies within attentional deployment are *distraction* and *concentration*. The former involves the attempts to focus attention on different and non emotion-relevant aspects of the situation, or to shift attention away from the immediate situation altogether – for example, turning away

from an unpleasant stimulus, going shopping to cheer oneself up, trying to recall happy thoughts and memories into one's mind, etc. The second focuses attention on the emotional features of a situation (Wegner & Bargh, 1997). Attention may be especially focused on one's own feelings. This tendency to concentrate on feelings and thoughts about one's self or about an event long time after the event is over has been called rumination (Martin & Tesser, 1996; Gross & Thompson, 2007). Usually experimental studies refer to rumination considering it as the tendency to focus on negative aspects of one's self or on negative interpretations of events, hence using thinking to amplify negative emotions (Ray et al., 2005).

 One powerful means of emotion regulation is to modify the way a situation or one's own abilities to cope with it are evaluated. It is widely agreed that a situation typically does not trigger an emotion in itself. Rather, it is the individual's evaluation (*appraisal*) of that situation that is able to generate it (Scherer, 1984). Within emotion regulatory strategies, cognitive change concerns the evaluation of the situation one is in a way to alter its meaning and emotional significance, either by changing the point of view one thinks about the situation or about one's capacities to deal with it. One frequent application of cognitive change is downward social comparison, that is comparing one's situation with that of a less fortunate person, thereby down-regulating one's negative emotion (Taylor & Lobel, 1989; Wills, 1981). Classical defense mechanisms such as denial, isolation and intellectualization can be included within this category (Gross, 1998b).

 Finally, response modulation refers to direct altering emotional responses, for example trying to hide emotion-expressive behavior or efforts to modify physiological responding. «In contrast with other emotion regulatory processes, response modulation occurs late in the emotion generative process, after response tendencies have been initiated. Response modulation refers to influencing physiological, experiential, or behavioral responding as directly as possible» (Gross & Thompson, 2007). For example, this category

may include strategies and techniques to reduce physiological responding, such as biofeedback (Allen et al., 2001) and relaxation (Suinn & Richardson, 1971) and strategies to control expressive-motor behavior, such as suppression (Gross, 1998a). Frijda (1988) with *the Law of Care of Consequences* stated that «every emotional impulse elicits a secondary impulse that tends to modify it in view of its possible consequences. The major effect is response moderation. Its major mechanism is response inhibition» (p. 355).

The process model seems to be based on a description of the emotional episode like a linear cascade which starts with an input/stimulus and ends - running through the appraisal process - with a response/output. Emotion regulation strategies are differentiated according to the moment in which they intervene in this cascade. However, this is – as recognized by the author himself – a theoretical simplification and in our view one of the main critical issues. Referring to the model, Gross (1998) has stated that «this input-output model does not do - and is not meant to do - full justice to the complexities of emotion. For example, this model does not adequately represent the multifaceted evaluation and modulation processes. Neither does this model capture the dynamic and recursive nature of emotion» (p. 225). In a more recent contribute to emotion regulation, Gross and Thompson (2007) have underlined the recursive nature of emotional generation and have suggested «the dynamic and reciprocally-determined nature of emotion regulation as it occurs in the context of an ongoing stream of emotional stimulation and behavioral responding. Similar feedback arrows might also be drawn from the emotional response to each of the other steps in the emotion-generative process. Each of these in turn influences subsequent emotional responses. On the antecedent side, for example, which emotions we have and how we express them are potent inputs into a new emotion cycle. [...] Modeling these real-time influences is a significant conceptual and empirical challenge».

The issue concerning the continuous and cyclical nature of the appraisal process is of main importance to our studies and it will therefore be discussed further in the final critical issue section. We are mainly

interested in the relationship between appraisal and regulation considering the existence of different informational contexts where the emotional event/stimulus is embedded, their influence on appraisal outcomes and hence on emotion regulation.

1.4. Zooming on reappraisal and cognitive change

One form of cognitive change which has been particularly investigated by experimental research is reappraisal (Gross, 1998a; Gross & Thomson, 2007). Reappraisal belongs to the antecedent-focused strategies and it consists in the attempt to change the way one thinks about the situation/event or to think about it in non-emotional terms (Gross, 1998a, 2002). As said above, it's the cognitive evaluation of external/internal stimuli that determines if and which kind of emotion is generated. Therefore, the assumption is that if one is able – through reappraisal – to modify the initial evaluation and meaning of the event, then the emotional reaction will change accordingly. Going back once again to Frijda's emotional laws (1988), and in particular to the *Laws of the Lightest Load and the Greatest Gain*, we discover that the construction of situational meanings – which is at the basis of emotion generation – leaves open spaces to the chance of emotional control. In fact «one can focus now upon this, then upon that aspect of reality. One can complement reality with imagination or detract from it by not thinking of particular implications. Whenever a situation can be viewed in alternative ways, a tendency exists to view it in a way that minimizes negative emotional load [...] and in a way that maximizes emotional gain» (p. 356). According to Frijda therefore, one mechanism of emotional control corresponds to the tendency to evaluate a situation or an event in such ways to decrease emotional intensity, prevent the occurrence of negative emotions or make such events more tolerable to endure (among his examples, defensive denial, depersonalization, entertainment of the «worst case hypothesis», guilt feeling in maltreatment victims, etc.)

The research focus on reappraisal is based on two general considerations: a) it's commonly and widely used in everyday life (Ochsner & Gross, 2004); b) several studies have pointed out that with respect to

other strategies – such as response modulation – reappraisal is not charged by adverse outcomes, e.g. memory impairment (for a discussion see 1.5.). «Cognitive reappraisal strategies, which influence the process of appraisal itself by changing the way the event is interpreted, are widely applicable and can successfully influence emotional experience and expression without the physiological and mental costs associated with suppressing behavioral expression of emotions» (Ochsner & Gross, 2004, p. 232).

1.4.1. Pioneering studies: manipulating appraisal

In one of the first studies which gave empirical support to this hypothesis, Lazarus and Alfert (1964) found that leading subjects to reappraise negative emotion-eliciting film clips had as a consequence the decrease of negative emotion experience. In this study, emotional reactions were assessed by means of self-reports and physiological measures, such as heart rate and electrodermal activity. Participants were asked to watch distressing and disturbing films depicting physical harm (e.g. a circumcision ritual). To alter the way participants appraised the stressful clip contents, Lazarus (1966) and his colleagues decided to add soundtracks or, alternatively, statements played before the film was shown. Soundtracks and statements were selected as to stress or reduce the disturbing features of the film events, for example denying the pain involved in the surgery (Lazarus, Averill, & Opton, 1970). «All of this worked beautifully. We could indeed substantially lower or raise stress levels by changing the ways in which participants construed the events portrayed in the films» (Lazarus, 2006, p. 31).

These studies demonstrated that proper cognitive strategies could reduce stress responses. However, since Lazarus's pioneering studies, few empirical studies have been conducted. Steptoe and Vogele, (1986) carried out an investigation of the role of cognitive appraisal in emotional responses. Experiential and physiological reactions to a distressing film were recorded in three condition: a) in the *intellectualization condition* participants were asked to watch the film in a detached, analytic fashion; b) in the *sensation-focusing* condition participants had to focus on physical sensations and to experience them fully, and finally c) in the *control condition*

no specific instructions were provided. No significant differences were found in the subjective or physiological responses of the intellectualization and control groups, thus failing to replicate previous reports. In the same way, Cantor and Wilson (1984) used cognitive manipulation through experimental instructions – e.g. telling that it was not real – to alter the emotional responses of preschool and elementary school children to a scaring film and in this way were able to reduce fear in 9-to-11-year-old children but not in preschoolers. Other studies provided a successful replication that a detached, analytical appraisal of films depicting factory accidents (Dandoy & Goldstein, 1990) or different interpretation of observed violence (Geen & Rakovski, 1973) could reduce both subjective and physiological responses. Tomaka and collaborators (1997) demonstrated that threat and challenge cognitive appraisals and physiological responses could be elicited experimentally by manipulating the instructional set and concluded that appraisal processes had a central role in the elicitation of threat and challenge responses to stressful situations.

1.4.2. Distancing or hiding: outcomes on the emotional response systems

In one of his first experimental studies on the process model, Gross (1998a) started to investigate if antecedent focused vs. response focused strategies had different consequences on the emotional reactions in different response systems within stressful or negative emotion eliciting contexts. In fact, according to the process model different strategies are expected to have different outcomes, with respect to the moment in which they have impact on the emotion generation process. Therefore, the aim was to directly compare two regulatory mechanisms and to test the theoretical assumption according to which strategies that target the emotional tendencies when they are still not fully activated – such as reappraisal – are actually able to reduce the overall emotional response, hence decreasing physiological arousal, expressive behavior and subjective experience. On the contrary, response-focused strategies – such as suppression of expressive behavior – which intervene later in the

generation process should (a) produce no effects on subjective negative experience, (b) decrease overt signs of emotions and heart rate, but (c) generate an increased sympathetic activity due to the effort to inhibit behavioral responses (Gross & Levenson, 1993; 1997).

A disgusting film clip depicting medical procedures (arm amputation) was used to elicit negative emotion (Gross & Levenson, 1993; Ekman, Friesen, & O'Sullivan, 1988). Participants were divided into three conditions according to the regulating instruction they received: a) in the *reappraisal* condition, they were asked to adopt a detached and unemotional attitude towards the clip trying to think about what they were seeing objectively and in terms of the technical aspects; b) in the suppression condition, participants were asked to behave so that – imagining that someone was looking at them – he/she would not have been able to understand that they were feeling anything at all; c) in the control condition participants received no regulation instructions but were simply asked to watch the clips. The study employed measures of emotional

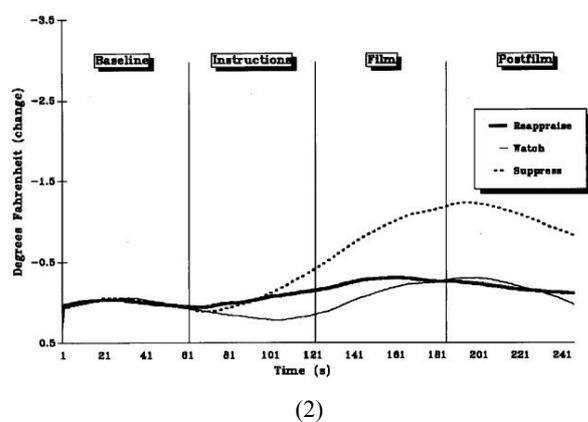
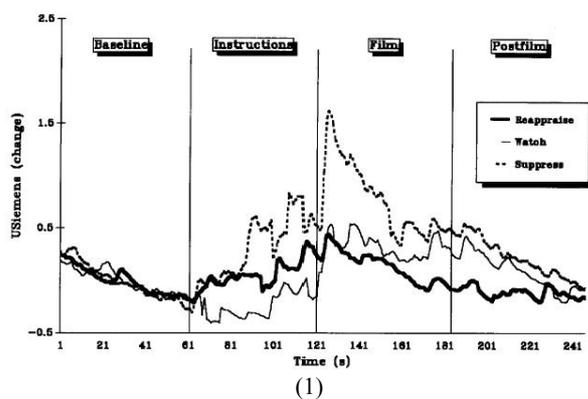


Figure 3: Skin Conductance and finger temperature (taken from Gross, 1998a)

responses in multiple systems: expression (non verbal emotional behavior was coded); subjective experience (self-report ratings); physiology. In particular, concerning physiological arousal, five measures were selected: three indexes about the sympathetic branch of the ANS (finger pulse amplitude; finger temperature; skin conductance) and two indexes about general somatic activity and heart rate (IBI, InterBeat Interval). Figure 3 shows two plots concerning the physiological response system, and in particular two measures

of sympathetic arousal – skin conductance (1) and finger temperature (2). As expected, participants in the suppression condition showed greater sympathetic activation compared to the other two conditions – and in particular they showed greater decreases in finger temperature as well as greater increases in skin conductance. However, two other hypothesis were not confirmed: first of all, no decrease in physiological response was significant in the reappraisal condition compared to the control one; and secondly no decrease in heart rate was observed in the suppression condition. With respect to the other response systems, results confirmed that (a) participants in the suppression and reappraisal condition showed less overt expressive behavior compared to the control subjects; (b) participants in the reappraisal condition reported less experienced disgust than control participants, whereas this was not the case in the suppression condition. In summary, Gross (1998a) concluded that reappraisal regulation strategy led to a reduction of both behavioral and experiential signs of negative emotion, without altering physiological responding; on the other side, suppression led to reduce expressive behavior, but was not efficient in diminishing the subjective experience of disgust. Moreover, this strategy also had as a consequence the increase of several measures of sympathetic nervous system activation.

Nonetheless, some points remained controversial and open to different explanations. A first unexpected result concerned the lack of physiological reduction in the reappraisal condition: differences in physiological activation between reappraisal and control participants were not significant. According to the author, two different explanations are possible: reappraisal strategy may have effect on the experiential and behavioral system but not on the physiological one (Stephoe & Vogele, 1986) or the amputation film used in the study was too distressing and produced so powerful autonomic sub-cortically mediated effects (Le Doux, 1989) that there was little room for cognitive strategies to shut them down. Gross (1998a) has suggested that with a milder clip or longer emotional episodes results obtained might be different. A second unexpected result concerned once more the physiological response, but in this case produced by the use of the suppression strategy. More in detail,

participants in the suppression condition did not show a decrease in somatic activity and heart rate, failing to replicate results of previous studies (Gross & Levenson, 1993).

1.4.3. Self-relevance: Changing the point of view to regulate one's own emotion

According to the above presented model, one possible strategy to regulate one's own emotion is reappraisal: it consists in the cognitive change of the meaning of a situation, in adopting a different point of view, in looking at a situation in a way as to alter its emotional impact. «Commonly, reappraisal involves adopting a positive mindset before entering a potentially negative situation» (Richards, Butler, & Gross, 2003, p.601). In this paragraph we will focus our attention on the possible different ways to cognitively modify the meaning of a situation and in particular on the role of self-relevance to down or up regulate emotions. As it will be showed, the study of reappraisal has been mainly accomplished through the use of instructions and direct requests to the participants. The role of self-relevance and the use of direct instruction will be then further discussed in the critical issues.

Experimental manipulation of reappraisal has mainly focused on helping the subject to distance himself in front of a negative events to down-regulate negative emotions such as disgust. For example, in Gross (1998a) participants watched a surgery film clip (amputation of an arm) and in the reappraisal condition they were asked to «*to adopt a detached and unemotional attitude as you watch the film. In other words, as you watch the film clip, try to think about what you are seeing objectively, in terms of the technical aspects of the events you observe. Watch the film clip carefully, but please try to think about what you are seeing in such a way that you don't feel anything at all*» (p. 227, italics added). In a similar way, Richards and Gross (2000, Study 2) used slides presenting images of injured and badly wounded men accompanied by information about the them (name, occupation) and about what had happened when they were injured. Once again, in the reappraisal condition, participants were instructed to «adopt a *neutral attitude* as you watch the slides. To do this, we would like for you to view

these slides *with the detached interest of a medical professional*. In other words, as you watch the slides, *try to think about them objectively and analytically rather than as personally, or in any way, emotionally relevant to you*. So, watch the slides carefully, but please try to think about what you are seeing in such a way that you don't feel anything at all» (p. 416, italics added). Analogous instructions were used in other studies (Ochsner et al., 2002; Hajcak & Nieuwenhuis, in press) asking participants to reinterpret negative pictures so that they no longer elicited a negative response. Participants were first given several examples in training sessions – using unpleasant pictures not included in the subsequent experimental session – where the experimenter described how it was possible to figure out a less negative interpretation of an image (e.g. a bloody crime scene could be the place where a murder investigation was finally solved). Participants' reinterpretations typically involved a story through which the negative event represented in the picture was resolved in a less negative way (Hajcak & Nieuwenhuis, in press).

To examine the effects of different types of cognitive reappraisal in increasing and decreasing negative emotions (up and down regulation), Ochsner and collaborators (2004) have asked participants to reappraise negative images relying on either self-focused or situation focused strategies. *Self-focused* strategies are aimed at altering the self-relevance of events, making people feel more or less connected to what is going on. To increase negative affect, participants were invited to imagine themselves or a loved one as the protagonist of the negative event (e.g. a sick person in a hospital bed) or to imagine «to be there» as the actions in the picture happened. On the contrary, to down regulate negative affect, participants were instructed to view the same kind of events from a detached, objective, third person perspective (distancing). On the other side, *situation focused* strategies are aimed at reinterpreting the nature of the event itself (actions, outcomes, intentions, etc.). To increase negative emotions, participants could imagine events depicted getting worse, whereas to down-regulate they had to imagine events getting better – e.g. in the case of the sick man lying in a hospital bed, one could think that this person is suffering, that his conditions are severe and that probably he's not going to

recover or on the contrary that his health is not so bad and that probably he's going to recover soon. Results concerning the subjective experience of negative affect revealed a main effect for type of instruction, hence suggesting that reappraisal was efficient in both increasing and decreasing emotion; the success of reappraisal did not vary with respect to the kind of strategy (self-situation focused).

Finally, reappraisal was manipulated in experimental studies aimed at the analysis of the consequences of different regulatory strategies in social interactions (Butler et al., 2003). For example, examining emotional regulation within conversations between romantic couples about their relationship conflicts, one member of the couple was instructed to think about positive aspects of his/her partner and beautiful moments spent together before entering the conversation: «by calling to mind thoughts of romantic camping trips, particular tender gestures of affection, or touching instances in which our partner was 'there' for us, for example, we may be able to construe a subsequent conversation about problems in the relationship in less aversive terms. Thus the work of reappraisal occurs *in advance of a potentially upsetting event*, and, if effective, should *pre-empt full-blown emotional responses*» (Richards, Butler, & Gross, 2003, p. 601, italics added).

1.4.4 .The neural bases of reappraisal

In recent years, research on emotion regulation has been enriched by functional imaging studies (fMRI) which have proved an effective methodology to investigate the neural bases of regulatory strategies such as reappraisal and cognitive control of emotion (Ochsner & Gross, 2005; Ochsner et al., 2004). As reappraisal has been defined as the ability to reframe an eliciting situation in unemotional terms or – said in other words – to cognitively transform an emotional event so as to alter its emotional impact, the neural bases of such a process were expected to highly involve interactions with the neural areas involved in general cognitive control (Ochsner et al., 2002). Thus, functional imaging studies have taken as a starting point evidence and inferences coming from studies of emotional processing on one side and «cold» forms of cognitive control, such as

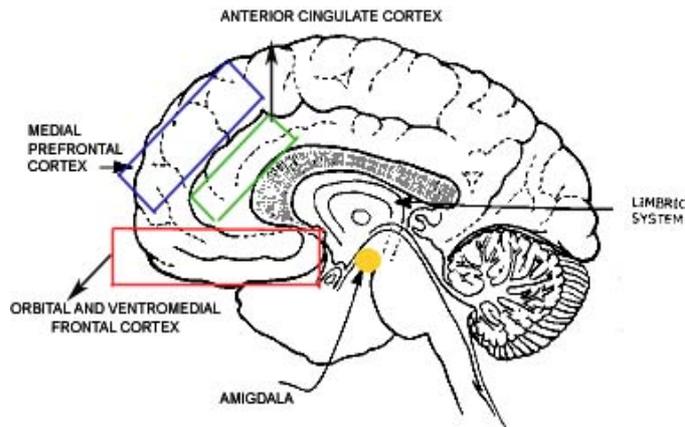


Figure 4: Medial section of the right hemisphere showing brain regions involved in cognitive control (MPFC and ACC) and brain structures responsible for emotional appraisal (MOFC and amygdala).

From Ochsner, Gross, (2004; p.233, C) modified.

(visual, auditory, etc.) information (Miller & Cohen, 2001; Smith & Jonides, 1999). According to these studies, prefrontal regions are hence responsible for cognitive abilities such as attentive selection and maintenance of goal-relevant information in mind (Ochsner et al., 2002; Miller & Cohen, 2001). Concerning reappraisal, it was predicted that this strategy would involve three processes and the respective frontal areas of implementation (Ochsner et al., 2002): (a) the activation of a strategy for cognitively transforming and altering the emotional impact of an eliciting event plus the maintenance of this strategy in mind until the event occurs – previous neuro-scientific studies have highlighted that this functions do rely on working memory processes localized in the Lateral PreFrontal Cortex (Smith & Jonides, 1999); (b) the conflict between top-down reappraisal efforts to control emotion and bottom-up evaluations that generate emotional responding – this second process should involve the activation of dorsal anterior cingulate cortex (Botvinick et al., 2001); (c) self-monitoring of the emotional changes due to reappraisal and evaluation of the relationship between internal states and external stimuli – associated with the activation of the Medial PreFrontal Cortex (Paradiso et al., 1999).

working memory, response selection and reasoning on the other (Ochsner & Gross, 2004).

Current cognitive neuroscience assumes that these forms of cognitive control involve the interaction between regions of lateral (LPFC) and medial prefrontal cortex (MPFC) and subcortical and posterior cortical regions that represent different kinds of modality specific

Secondly, concerning emotional processing systems, research has assumed the existence of two types of evaluations at the basis of the generation of emotions which are mediated by two different but highly connected brain structures (Scherer, Schorr, & Johnstone, 2001): (1) the first type is relatively automatic and is aimed at evaluating as rapidly as possible whether the stimulus is affectively relevant; the main brain structure responsible for this preattentive recognition of affective stimuli is the amygdala, which also controls the activation of adaptive physiological and behavioral responses to them (LeDoux, 2000; Bechara, Damasio, Damasio, Lee, 1999). (2) The second type of evaluation comes later and is aimed at the more elaborated evaluation of contextual meaning and appropriateness of potential responses (Lazarus, 1991). This second evaluation is mediated by the Medial Orbital Frontal Cortex (MOFC) which plays an important role in representing the hedonic valence of a stimulus (positive vs. negative) (Kawasaki et al., 2001). Research has questioned whether reappraisal should modulate both the processes involved in the evaluation of the affective relevance of events/situation and thus whether this modulation was evident on both amygdala and MOFC.

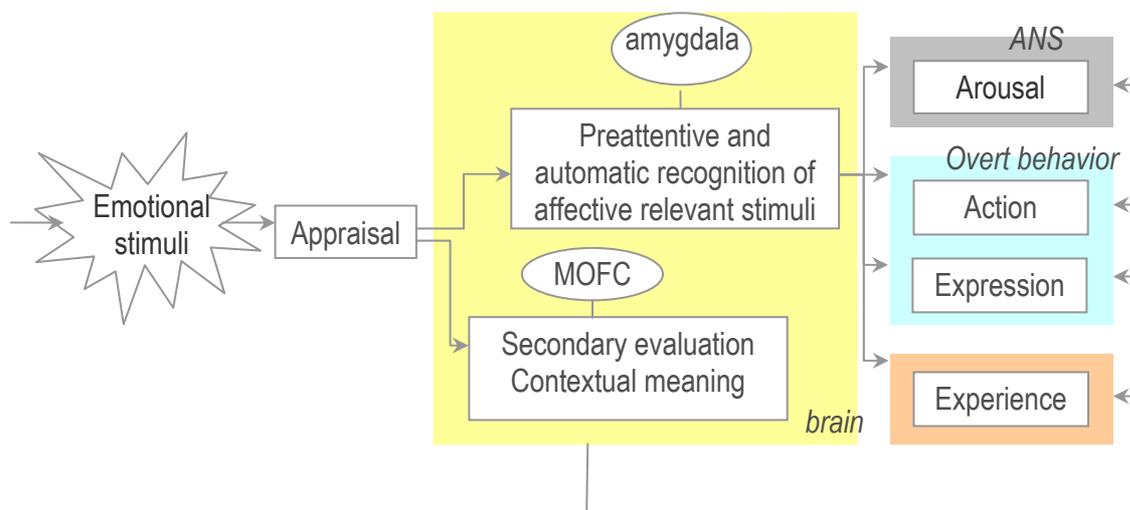


Figure 5: Schematic plot of the two types of evaluation (appraisal) generating emotional responses: a first almost automatic and preattentive recognition of affective relevant stimuli driven by amygdala (i.e. a threat or danger); a secondary evaluation of the contextual meaning and coping responses driven mainly by the Medial Orbital Frontal Cortex MOFC).

In a first study, Ochsner and colleagues (2002) tried to answer these questions adopting a previously used methodology to distinguish between emotion and emotion regulation (Jackson et al., 2000; see 1.1.2.). The authors thus employed two conditions: on ATTEND trials participants were instructed to look at the picture and respond naturally, being aware of their feeling but without trying to change them; on REAPPRAISAL trials participants had to look at pictures trying to reconsider them in a way that made them feel no emotion. Pre-scan training sessions were conducted.

Each trial began with a 4 sec presentation of a neutral or negative picture and participants simply had to look at it (emotion generation interval); secondly the ATTEND or REAPPRAISE instruction appeared and participants had to follow the respective instruction for 4 more seconds. The study predictions were the following ones: 1. during the second portion of each trial, the reappraisal instructions should lead to a greater activation of prefrontal cortex whereas 2. the ATTEND instructions should lead to greater activation of the MOFC and the amygdala. Results confirmed these hypotheses. Reappraisal sensitive regions – identified by greater activation in response to negative photos in REAPPRAISE trials – included left LPFC and dorsal MPFC, plus additional activation in left temporal pole, right supramarginal gyrus, and left lateral occipital cortex. On the contrary, on ATTEND trials greater activation was observed in left MOFC, amygdala, posterior insula, medial occipital cortex and right inferior parietal cortex. Moreover, the activation in the LPFC and MPFC areas was inversely correlated to the activation of MOFC and amygdala. Anterior Cingulate cortex (ACC) activation was not observed in the group contrast ATTEND vs. REAPPRAISE, but a positive correlation was found between ACC activation and effective reappraisal. In summary, these findings indicated that reappraisal is associated with the activation of lateral and medial prefrontal cortex – areas usually involved in working memory, cognitive control and self monitoring (Smith, Jonides, 1999; Miller, Cohen, 2001)– and with a decrease in both amygdala and MOFC – regions responsible for emotional processing and in particular with the evaluation of affective salience of

stimuli (Le Doux, 2000; Ochsner & Feldman-Barrett, 2001; Ochsner & Gross, 2004).

Further studies have extended these results (Levesque et al., 2003; Beauregard et al., 2001). A second study (Ochsner, et al., 2004) was aimed at two different goals: (1) considering both cognitive up and down regulation of negative emotion: in fact, one could predict that these processes are supported by similar (prefrontal) areas because they both involve creating an alternative meaning or interpretation of an event, but, on the other side, one could also expect different modulation of the amygdala activity - expecting cognitive up-regulation to be associated with increased activation whereas cognitive down-regulation with decreased amygdala activation; (2) examining two different kind of reappraisal strategies (cfr 1.4.3.) in a 2(situation vs. self focused)X 3(look, increase, decrease) experimental design. According to the hypotheses, results showed that up and down regulation of negative affect involved common areas of activation: left LPFC usually implicated in cognitive control, ACC implicated in performance monitoring, dorsal MPFC implicated in self-monitoring, different modulation (increasing vs. decreasing) of amygdala activation. Modulation of amygdala activation was (positively in case of up-regulation and negatively in case of down-regulation) correlated with activation in Prefrontal Cortex. However, up and down regulation also involved selective regions of activation: up-regulation activated left rostral MPFC and posterior cingulate cortex, which may be linked to generating words that describe emotional events (Crosson et al., 1999); down-regulation activated right LPFC, which may be responsible for behavioral inhibition (Bunge et al., 2001), and right orbito-frontal cortex, which intervenes in altering motivational relevance of affective stimuli and reversing the aversive connotation of stimuli (Bechara et al., 2000). Moreover, down regulation recruited both left and right PFC, whereas up-regulation activated mostly left-lateralized systems (Davidson & Irwin, 1999). Considering the second goal, self and situation focused strategies were associated with common activation of prefrontal and amygdala systems. However, self-focused strategies differentially activated MPFC when down-regulating emotion (in particular recruiting a region involved

with self-referential judgments) (Kelley et al., 2002). On the other hand, situation focused strategies differentially activated regions of the LPFC generally involved in the processing of information about stimuli in the external world (D'Esposito et al., 2000).

Overall, these findings have brought evidence supporting the idea that the areas of the prefrontal cortex are involved in cognitive processes that down-regulate the activity of the amygdala and other brain structures responsible for the processing of emotional relevant stimuli. Although fMRI has revealed an important technique to investigate the neural bases of cognitive emotion regulation, the limited temporal resolution does not allow the study of the temporal flow of reappraisal-related processes which on the contrary may be more efficiently accomplished through the use of EEG (Hajcak & Nieuwenhuis, in press). In particular, EEG studies have showed a substantial difference in the late positive potential (LPP) – a component of the event related potential (ERP) – between emotional relevant and neutral stimuli (Keil et al., 2002; Schupp et al., 2003). The LPP is generated around 250 ms after the stimulus presentation and it is highly sensitive to emotional intensity (Schupp et al., 2000). Moreover, it has been showed that the LPP is reduced under condition of voluntary suppression of negative emotion (Moser, Hajcak, Bukay, & Simons, 2005). In a recent study Hajcak and colleagues (in press) have tried to determine the impact of reappraisal on LPP using an experimental paradigm similar to the previously presented fMRI studies (Ochsner et al., 2002). Results showed a distinct electrophysiological correlate of reappraisal which was associated with a protracted reduction in the magnitude of the LPP: on REAPPRAISE trials, the amplitude of LPP was significantly reduced compared to ATTEND trials. More precise temporal analyses indicated that (1) the reappraisal-driven modulation began early, i.e. just 200 ms after the onset of unpleasant stimuli and (2) continued for at least 2 sec supporting the idea that reappraisal influences the emotional processing for the entire duration of stimulus presentation. Finally, the reduction in LPP amplitude was positive correlated with a reduction in self-ratings of emotional intensity following reappraisal, thus indicating a positive correlation between neural activity and subjective experience.

1.5. Critical issues

In the previous paragraphs we considered a selection of themes and research from emotion regulation literature thus presenting the main issues relevant to the present study. Obviously this selection is by no means exhaustive of all emotion regulation research and many are the issues taken into little account and the ones still open to future research – emotion regulation in life span, investigation of regulatory strategies other than reappraisal and suppression, immediate vs. long-term consequences, relations with other forms of self-regulation, etc. (Gross, 1999; Gross, 2002; Gross & Thompson, 2007).

In this paragraph we will focus our attention on some critical questions that we chose to face in the present study. Tracing boundaries between emotion and emotion regulation is extremely difficult, as already stated at the beginning of the chapter. In the light of the presented discussion about the possibility to distinguish between emotion and emotion regulation, we do refer to the process model which is meant to provide an operational model, an «integrative framework» to investigate emotion regulation processes and individual differences within the recognition that emotion generation and regulation are actually tightly linked (Gross & Thompson, 2007). However - starting from this model and in particular form the study presented in 1.4.2 (Gross, 1998a) - the attempt was to go into depth on two specific issues. 1) The first one concerned the complexity of the appraisal process (see 1.3): on one side we'll consider how different situational contexts may embody the same emotional event/stimulus giving origin to different meaning structures and hence differently influence emotion regulation; on the other side we'll consider how a specific population, i.e. nursing students may be selected to create an experimental contextualized scenario in the same way as Ekman et al. (1991). 2) The second issue concerned the reappraisal strategy of emotion regulation, its experimental induction and the focus on the role of self-relevance to cognitively reappraise an event or situation.

1.5.1 The context matters

The process model has as a start-point the assumptions of appraisal theories, according to which emotions are generated by cognitive evaluations of situations and events and the emotional process can be conceived as «*a continuous updating of the appraisal profiles, starting with preliminary and rudimentary information and resulting in ever more complete and detailed information*» (Scherer, 2005). Given the *continuity* of the appraisal, as stated by Gross (1998a), the process model necessarily includes simplifications: «in our view the appraisal process does not proceed from perception to emotion and then stop; rather it iterates continuously providing updated appraisals as stimuli and events change over time. That being said, it is useful to consider one iteration in isolation, then examine how different types of emotion regulation might impact different points of the appraisal process. In this way differences between, and relationships among, regulatory strategies can be understood in terms of how they modulate the appraisal cycle» (Ochsner & Gross, 2004; p. 231).

As presented above, to empirically investigate the distinction between antecedent and response focused regulation, most studies concerning the affective and physiological consequences of those different regulatory strategies have employed film viewing as useful method to elicit emotion as film clips provide standardized, dynamical and ecological stimuli (Gross & Levenson, 1995; Rottenberg et al., in press)¹. The approach has been mainly a categorical one, selecting film clips known to elicit a specific emotion, e.g. amusement, disgust, sadness, etc. and then analyzing the self-report, behavioral and physiological data referring to the emotional film viewing with respect to data coming from the baseline period (neutral clip) confronting experimental conditions usually corresponding to different regulation instructions. A next step may be to determine the functioning of regulatory strategies in a dynamical emotional episode taking into account the consequences of different appraisal outcomes, i.e. examining regulation

¹ In other studies ecological eliciting situations have been used, e.g. experimental anger induction (Mauss et al., press).

of emotions elicited by the same event included within distinct informational contexts which support different appraisals. For instance, considering the emotional event in Gross (1998a), the amputation of an arm, which kind of affective outcome may have the evaluation that this surgical operation is done to save a life vs. it is one of the cruel and uncontrollable consequences of wars? Or more, the evaluation that it's something that is happening to someone else vs. it can happen to «me»? If emotion and emotion regulation are so tightly linked, each outcome of the appraisal process should influence the emotional reaction and thus its regulation. «Controlled processing of appraisal information may be a common way that people try to regulate emotions in life, as when the survivor of a car crash attends to information indicating he was not the cause of his companion's death (altering agency appraisal)» (Roseman, 2001; p.83).

Emotion research tells us that events are evaluated and such an evaluation determines the correspondent emotional reaction and its intensity (Scherer, Schorr, & Johnstone, 2001). According to Frijda (1988) the construction of situational meaning structures is at the basis of emotion generation: «Emotions change when meanings change. Emotions are changed when events are viewed differently. Input is changed, and output changes accordingly» (p.350). Lazarus's work (Lazarus & Alfert, 1964) demonstrated that manipulating appraisal – modifying contextual elements such as the soundtrack or providing anticipatory contextual information about the event - gave rise to different emotional responses (*see* 1.4.1).

1.5.1.1. Appraisal relevant situational information

According to Reisenzein (1995), the quality of emotion may be influenced by manipulating the nature of information that is provided to participants, as people differentiate emotions on the basis of *appraisal relevant situational information* (Reisenzein & Hoffman, 1993). Emotions are dynamic processes embedded in a physical and situational *context*, which highly determines the appraised meaning. According to appraisal theorists, emotional responses do not arise as consequences of an event *per se*

considered, but they are functions of the relationship between the individual and the environment and they are mediated by a cognitive evaluation of the event itself (*appraisal*, Arnold, 1960). This means that *the same event may give rise to different emotions if differently appraised*. The assumption is that emotions correspond to patterns of appraisal and different models have been proposed to enumerate the appraisal dimensions² or criteria according to which events and situations are evaluated (see Scherer, Schorr, & Johnstone, 2001). For instance, among appraisal dimensions theorists have included a) the level of unexpectedness/novelty; b) pleasantness or hedonic valence; c) goal relevance or concern; d) goal congruence or incongruence (whether the event is wanted or unwanted by the person); e) locus of control or responsibility (the person attempts to attribute the cause of the event and to detect the individual responsible for its occurrence, whether this was intentional or not, etc.); f) coping potential and resources to face the event; g) probability (certain vs. uncertain; whether the occurrence of the event is merely possible or is definite); etc.

Besides appraisal dimensions, emotions have been associated to *core relational themes* (Lazarus, 1991; 2006; Smith & Kirby, 2001), which are supposed to represent a particular pattern of outcomes along the previously mentioned appraisal components. In fact, according to Lazarus, it is necessary not only to separate the distinct appraisal components or dimensions, but to consider a second level of analysis which organizes those dimensions into a complex, integrated meaning-centered emotional whole. For example, fear, which is thought to motivate self-protection in front of potentially dangerous situations, is associated to the theme of threat – of an immediate, concrete physical danger; sadness is elicited by having experienced an irrevocable loss and it implies the evaluation of low coping potential and of low future expectancy (helplessness); anger is associated to the relational theme of a an injustice and humiliating offence against me and mine.

Following Scherer (2001) who has distinguished four appraisal objectives (relevance, implications, coping potential, normative

² It has been suggested that emotions are differentiated also on the base of bodily feedback (Lambie & Marcel, 2002) and action tendencies (Frijda, 1986).

significance), which concern the type of information the person needs about an object or event in order to prepare a reaction, we focus on the first two types of appraisal components, relevance and implication assessment. Among the appraisal relevant information, great importance has been attributed to the goal *relevance or concern*, which is part of the so called primary appraisal. According to Scherer (2001) emotions are *relevance* detectors: «how relevant is this event for me? Does it directly affect me or my social reference group?» (p. 94) According to Frijda and the law of concern (1988), emotions arise in response to events that are important for the individual: «thus it goes that a *personal* loss that is felt as irremediable and out comes grief, with a high degree of probability. [...] We suffer when ill befalls someone because, and as long as, we love that someone. [...] One suffers when a cherished person is gravely ill; one feels joy at his or her fortune or recovery; one is angry at those who harm him or her». Tesser (1990) has named *personal relevance* among his *situational features*, together with interpersonal distance (close vs. distant other) and social comparison. Reisenzein and Hoffman (1990) have obtained evidence for the role of *focus* – i.e. the event affects primarily the self vs. the other – in differentiating emotional experience.

Secondly, individuals evaluate what the implications and *consequences* of an event are and how they affect the organism well-being and goals. The perceived outcomes for the individual, their probability and the possibility to cope with them (*coping potential*) determine the emotional reactions (Scherer, 2001). Going back to the previous example, viewing the amputation of an arm (event) may give rise to different emotional reactions if thanks to it physicians can save lives and people who had to undergo this surgical operation are then able to cope with it through to a rehabilitation program vs. it's evaluated as a terrible event which destroys a person's chances of a normal life forever.

1.5.1.2. The case of nurses.

Emotion research indicated that different cognitive appraisals are elicited not only by characteristics of the situation or event, but also depend on individual features and thus the odds of experiencing a certain

type of emotion may be influenced by variables such as age, gender, personality, culture, education, professional activity, etc. (Scherer, 2004). Each of these variables may in fact modify the evaluation with respect to different appraisal dimensions, as for example, the relevance to one's own goals. Concerning professional activity, several studies have analyzed emotional processes within specific populations, as for example health professionals and in particular nurses. As a matter of fact, medical working contexts confront employees with events such as deaths, illnesses, surgeries, etc. and therefore enhance the odds of experiencing negative and stressful emotions.

Emotional labor³ has been an important topic of debate in nursing (Philips, 1996). Bolton (2001) has suggested that nursing is one of the occupations most commonly associated with extensive emotional work. Mitchell and Smith (2003) stated that emotional labor has always been «part of the image of nursing» (p. 111). Several reasons for this were hypothesized: for example, nurses frequently have to cheer up patients with serious illnesses and console family members given bad news, all of which require the use of emotions (De Castro, 2004). Smith and Gray (2000) also pointed out that emotional labor is a strategy that allows nurses to present an impersonal approach, especially when dealing with difficult medical experiences, death and dying. A large amount of data have highlighted that 25-30% of health care professionals – including nurses, physicians, etc. – develop burnout as a consequence of their activity in clinical settings and report feelings of emotional exhaustion,

³ This concept was first defined by Hochschild (1983) and has been used to denote processes of emotion regulation as it occurs within work contexts (Zammuner et al., 2003). Emotional labour may be defined as «the effort involved when employees regulate their emotional display in an attempt to meet organizationally based expectations specific to their roles» (Brotheridge, Lee, 2003, p.365). Organizationally based expectations or norms define which emotions employees should express and which emotions they should suppress. This means that there are likely to be occasions when spontaneously felt emotions conflict with context-desired emotions and this emotional dissonance or discrepancy leads to emotional labour when employees try to regulate their feelings and to express the required context-congruent emotion.

depersonalization in the relationship with patients and a sense of low personal accomplishment (Grassi & Magnani, 2000; Dorz et al., 2003). In a recent studies (Zammuner et al., 2003; Mann & Cowburn, 2005) results showed that emotional labor was an important factor for well-being of hospital professionals whose work involves interactions with patients. Regarding its two regulation facets⁴, Surface Acting was found to be positively associated with two burnout components, i.e. Emotional Exhaustion and Depersonalisation, whereas Deep Acting was positively related to Depersonalization. The authors have suggested a cyclical model of stress and emotional labor, so that the emotional labor that is performed to mask the stress experienced is itself a source of further stress. Finally, Surface Acting was found to be the major predictor of emotional labor: this means that Surface Acting is more onerous than Deep Acting and this was attributed to the inauthenticity involved by Surface Acting and the feeling of detachment from one's own emotions that it can bring.

The concept of Surface Acting may be considered near to Response Focused Strategies as theorized by Gross (1998a) in the process model of emotion (see 1.3). As a matter of fact, as opposite to Deep Acting, it only involves the modification of overt behavior and expression, thus including a sense of inauthenticity among its consequence as it is the case of Expressive Suppression (Gross, 2002). In a recent study (Vlahou & Vanman, 2004), 46 graduate students in nursing were compared to a control group of undergraduate students on their physiological (heart rate and electrodermal activity) and self-reported emotional reactions to film

⁴ Hochschild (1983) has argued that emotional labour may be performed in two different ways. *Surface Acting* involves managing the expression of behaviour rather than feelings: it represents a superficial form of emotion regulation, which involves the regulation of one's own overt expression and non verbal behaviour (i.e. facial expression, gestures, voice, etc.). Through surface acting a worker simply acts as if he/she feels the context-required emotion. On the other hand, *Deep Acting* involves the worker effort to actually feel and experience the emotion he/she is expected to display (Mann, Cowburn, 2005). This second dimension of emotional labour hence represents an intrapsychic form of emotion regulation.

clips that depicted stressful medical procedures. No group differences were found in the self-reported use of suppression and reappraisal. Nurses reported experiencing less disgust and tension but more sadness while watching the clips than the controls. When compared to the suppression condition, the use of reappraisal was not related to nursing experience or to self-reported physical and emotional health, and it did not result in increased sympathetic activation during the clips.

A second area of investigation has concerned coping strategies. The studies conducted in this field did support the role of coping mechanisms for perceived stress either as predictive or protective factor. For example, it was found that coping styles that involve cognitive and behavioral disengagement were associated with higher burnout and intentions to give up the profession in the AIDS field (Martin, 1990). Moreover, avoidance coping was positively related to burnout in psychotherapist working with persons with HIV disease. Concerning nurses, similar findings were observed by Gueritault-Chalvin et al. (2000), showing that the use of external coping strategies were positively associated with burnout, whereas the use of internal coping showed protective effects. In a recent study, Dorz et al. (2003) have tried to identify specific coping strategies associated with the presence of high levels of emotional exhaustion, depersonalization and personal accomplishment in a sample of Italian caregivers (nurses and physicians). Results showed that adaptive coping strategies may act as a protective factor for burnout: Planning, i.e. to reflect and develop strategies to solve the problem, and Restraint Coping, i.e. to avoid acting impulsively waiting for the right moment to cope with the stressor, were predictive factors for Personal Accomplishment. On the other side, Denial and Humor strategies were associated with emotional exhaustion and depersonalization.

All these studies suggest that among health care professionals, nurses are exposed to a large number of stressful stimuli within their work environment, and therefore present an increased need for effective emotion regulation strategies. For this reasons, in a study on non verbal behavior and deceit detection, Ekman et al. (1991) recruited student nurses as experimental sample. Participants were videotaped in a number of

standardized interviews during which they watched a short film and answered the interviewer's questions concerning their feelings about it. In one of the interviews subjects saw a film showing amputations and burns intended to elicit strong unpleasant emotions and were instructed to hide their negative feelings and convince the interviewer that they were watching a pleasant film. Thus, the deceptive scenario was characterized by the high «motivation of the liars. Our subjects [...] believed, as we did, that their ability to control their negative emotions while viewing upsetting surgical procedures was important for their later career success». Student nurses were told they were participating to a study of communication skills and were explained that they would see the type of upsetting material they would soon be confronting in an emergency room. They were told that they would need to conceal any fear, distress, or disgust to obtain cooperation from the patient and family by appearing confident and optimistic (Ekman, Friesen, & O'Sullivan, 1988).

1.5.2 Inducing emotion regulation

A second issue concerns the manipulation of the type of regulation strategies which has been mainly accomplished through the use of instructions and the direct request to the participants to «try to think about what you are seeing in such a way that you don't feel anything at all» for reappraisal (Gross, 1998a) and to «show no emotional response, that is, if someone were watching you, they shouldn't have any idea how you were feeling» for suppression (Demaree et al., 2006). Post-questionnaires have then been used as manipulation checks, as post-session control to assure that participants had actually employed the strategy requested (Gross, 1998a).

Concerning the studies about antecedent vs. response focused strategies and their different affective and physiological consequences (*see previous paragraphs*), Demaree et al. (2006) have recently questioned whether participants were actually following the regulatory instructions as intended by the experimenter. Do individuals actually follow the given instructions? Is it possible that participant rely on antecedent (cognitive) strategies even when asked to employ response-focused ones (behavioral)? To answer this

question, in their study (Demaree et al., 2006) participants were asked to watch two emotion (disgust and amusement) eliciting film clips and were given instructions to regulate – suppress or exaggerate – their emotional behavior (just prior to film presentation in order to minimize differences in physiological baseline). At the end of the session, a questionnaire asked participants to describe in which way they had actually tried to control their behavior. Results showed a surprising high rate of spontaneous cognitive strategy use following response modulation instructions especially for down-regulation (suppression). Regarding affective consequences, the data showed that cognitive strategies decreased emotional experience to negative stimuli, whereas no decreasing effect was found on the sympathetic activation produced by the use of response modulation strategies. The authors have hence concluded that more specific instruction should be used to increase the likelihood that participants strictly follow the experimental requests suggesting the need to further deepen the correspondence between instructions and strategies actually used: «for example, researchers may benefit by focusing on facial musculature when providing response-focused instructions. [...] Antecedent-strategy instructions may likewise benefit from increased specificity» (p. 1258). In the same way, Ochsner and collaborators (2004) have stated that variability of results across studies about the neural bases of cognitive control may be due to the use of different reappraisal strategies by participants. In fact, most studies have instructed subjects to actively reinterpret the meaning of an event without specifying exactly how they were to do this. Therefore, the authors proposed to systematically examine the distinction of two types of reappraisal strategies: *self* or *event focused* (cfr 1.4.4).

1.5.2.1. Immersed vs. detached attention mode

The distinction self vs. event focus has roots on psychological theories that suggest the centrality of the self and of self-relevant information in memory, emotion and motivation (Baumeister, 1998) and neuroscience studies which have identified distinct regions for self-referential processing (Kelley et al., 2002). Northoff (2005) has underlined

that several areas of the prefrontal (VMPFC, DMPFC) and cingulate cortex (PACC) implicated in emotion regulation are also involved in relating emotional stimuli to the self: the more self-related the stimulus content is appraised, the more activation is registered in these areas. This means that self-relatedness and emotion regulation are overlapping processes in these brain areas. The author has thus questioned whether self-referential processing is one possible way to regulate emotion and in particular emotional experience (*subjective feeling*): the more a stimulus is related to the self, the deeper personal involvement and hence stronger feelings.

In a contribute - recently considered also by Frijda (2005) - Lambie and Marcel (2002) have taken into account the variety of forms that emotional experience can take as well as the multiple and often diverging explanations given on its nature by psychological literature. In their contribute, the authors have related such a variety to the different degree of involvement of awareness and focal attention in emotional experience. Lambie and Marcel have thus highlighted four distinctions that shape emotional experience: (1) first vs. second order emotion experience, where second order experience is characterized by awareness and focal attention; (2) self vs. world focused experience like a figure-ground articulation, i.e. attention can be directed to the world and to external objects or towards oneself as the person having an experience and «the agent of actions». For example, a possible way to focus on the self is to attend to one's own body feelings, whereas world focused emotion experience is awareness of a portion of the world under an emotional description, e.g. a frightening animal; (3) evaluation vs. action focus: attention can be directed to how the emotional object appears or to one's own actions; (4) immersed/synthetic vs. detached analytic mode of attention. With regard to this last difference – which is the one of main interest here – the authors have suggested that a first dimension of the attention mode is the degree to which one is assuming an analytical or synthetic point of view, whereas the second dimension concerns the extent to which the person is immersed or detached in the object of attention. «Analytic isolation of information sources robs an experience of its emotional character» (Frijda, 2005;

p.482). «The more analytic one's attention is, the more one's experience is abstracted and de-contextualized. [...] One example of detachment is reflective observation of oneself engaged in whatever is doing. Another example is observation of the world as something separate from oneself, unaffected and unaffected by oneself. This is often termed being cool. [...] Those who are restricted to immersion are at the mercy of emotional reaction and are unable to abstract themselves from the specific situation; those who are restricted to detachment show the opposite, not reacting to or caring about what would seem to be of personal relevance» (p.235). As stated by Frijda (2005), detachment can occur both in self focus, and in this case it may give rise to depersonalized feelings such as «this is not actually happening to me», or in world focus, leading to feelings of unreality and to derealization: «Experience is cold although the meanings may be present in first order experience and arouse reactions such as wetting one's pants and biting one's lips till they bleed» (Frijda, 2005; p. 482). Lambie and Marcel (2002) have concluded that manipulating the attentional focus (to world or self, to evaluation or action) or the mode of attention (detached vs. immersed) will affect whether or not an emotion is felt and eventually the kind of description given.

1.5.2.2. Engagement vs. detachment: a critical issue in health care profession

The focus on the dichotomy between a detached vs. immersed attitude represents a major issue also in the medical and nursing literature and it has been applied to the relationship between caregiver and patients. The main problem has concerned which levels of detachment vs. engagement are adequate and functional in this relationship for the health worker to provide the needed treatments to patients and cope with their suffering. The concept of a detached physician accurately viewing a patient's emotions has pervaded medical literature of the twentieth century (Halpern, 2003): in this perspective, whereas sympathetic physicians risk over-identifying with patients, «the neutrally empathetic physician will do what needs to be done without feeling grief, regret or other difficult emotions» (Blumgart, 1964). The underlying assumption is that the health

practitioners need to remain disengaged or detached from the patient's suffering to be able to provide the required care. Thus, emotions are seen as a threat to objectivity and have to be neutralized: «the same detachment that enables students to dissect a cadaver without disgust allows them to listen empathically without becoming emotionally involved» (Fox & Lief, 1963).

However, in the last decades several authors have started to point out that the model of detached concern may not be functional and should be integrated with a deeper attention to caregivers' emotions (Fox, 2006). In his contribute, Halpern (2003) employed the concept of empathy and emotional attunement. The author claimed that although the importance of empathy has been increasingly recognized by medical educators and professionals, in the field of medicine empathy is still defined as the act of acknowledging the emotional state of the patient without experiencing it oneself – according to the widespread norm of detachment. Opposing this conception, Halpern suggested the importance of engaged empathy, i.e. the ability of emotional attuning to the patient. In the same way, Morse et al. (2006) recognized that in the past 3 decades nurse educators have universally incorporated the concept the empathetic model of communication into nursing curricula. However, the authors argued that empathy is not appropriate in clinical settings and suggested engagement as the essence of nurse-patient relationship. The model proposed by the authors is focused on two main characteristics: 1) whether the nurse is focused on the patient response hence embodying the sufferer's experience or is focused on the self protecting himself from experiencing the patient's suffering and 2) whether the response is spontaneous or learned (first or second level response). The intersection of these dimensions gives rise to four possible different responses: 1) the first-level engaged response, i.e. the nurse is engaged with the patient's suffering and suffering itself becomes a shared experience; however, the constant exposure to patients' distress may overwhelm the nurse so that he/she needs to limit his or her involvement to avoid becoming emotionally drained and exhausted; 2) the second-level professional pseudo-engaged response, i.e. the nurse tries to reduce his/her emotional responses to the patient's suffering and relies on

a repertoire of cognitive and behavioral communication strategies (e.g. informative reassurance, humor/distraction, etc.) in place of emotional reflexive processes; 3) the first-level anti-engaged reflected response (denial, distancing, dehumanizing, withdrawing, etc.), i.e. the nurse feelings are blocked or ignored to protect from being embodied with the patient's suffering and keep the nurse emotionally separated from the sufferer; 4) the second-level detached response, i.e. the nurse has learned complete detachment and patients are treated as objects or cases. According to Morse et al. (2006), being constantly involved in engaged relationships and using first-level responses is not beneficial for the nurse. Thus, as nurses become more experienced, they learn to control the level of engagement with patient and to remain detached and disembodied. On the other side, complete detachment and disengagement is not beneficial for the patients and may be alienating (Kralik, Koch, & Wotton, 1997). Therefore, «regulating the degree of emotional engagement between self and patient – not too close and not too distant» (Meier, Back, & Morrison, 2001) is one of the main challenge in health care profession.