The psychologist's point of view

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The psychological point of view is that "emotion" represents a meaningful and necessary concept.

This statement is not a truism. One can hold that "emotion" is no more than a chapter heading (Bentley, 1928), or a folk conception based on preconception, not on facts. As Magda Arnold wrote in 1970: there are a number of "perennial problems in the field of emotion". Definition of emotion is one of them, and so is the question of whether it represents a coherent domain of study.

Indeed, the word "emotion" itself may give reasons for doubt. It may not represent a natural class of phenomena. It also is of relatively recent origin. In its present sense, it dates from about 1649, the publication date of Descartes' *Passions de l'âme*. Not all languages possess a more or less equivalent concept (Wierzbicka, 1995). Nevertheless, most languages do, and for good reason. The word fills a need in pointing to particular phenomena of feeling and behavior. Which these phenomena are transpires from the term itself, and from its equivalents in other languages. Around the time that Descartes first used "emotions" for "*les emotions de l'âme*", it meant uproar or social unrest, with its implications of unruliness and vehemence (Cayrou, 1924). Ancient Greek used the term *pathèma*, and early French and English used *passion*, that is, mental events involving passivity. "Passions" differ from "actions", in that the individual feels the actions or inclinations for them passively came over him or her, rather than flowing from their initiative. The Latin near-equivalent, *affectus*, had a similar connotation: an event or experience that one is

affected by. Sanskrit employed *bhava*, meaning something like a “state of mind that becomes”, that is, which movements flow from (Shweder & Haidt, 2000). The notions of passivity, being affected, and uproar all refer to the phenomenon that certain feelings and behavioral inclinations tend to intrude upon ongoing thought and behavior. They seek to asssume control, tend to persist over time, and may do so even when prevailing conditions make it advisable not to do so.

These control shifts appear largely due to feelings. *Pathèma, affectus, emotion* and *bhava* all are felt. People profess to feelings, and perhaps do so everywhere. Feeling indeed looms large in definitions of emotion (see Kleinginna & Kleinginna, 1981). Humans appear to “express” them in movements and sounds that do not appear to serve instrumental purposes, but still function in communicating the states of mind to others. Both feelings and behavior pivot around acceptance and rejection of people (including oneself), objects, or events. They pivot around inclinations and disinclinations to deal with them, around professed feelings of like and dislike or of pleasure and pain, and of judgments of good and bad (Nussbaum, 2001). The distinction between good and bad appears a universal component of language (Wierzbicka, 1995).

People, objects and events, and the feelings they evoke, moreover, do not leave one cold. They affect one’s body and one’s cognitive functioning. One may tremble, become confused, or believe what one knows to be untrue.

The psychologist’s point of view thus points to a domain of phenomena of feeling, behavior, and bodily reaction which requires explanations different from those required for explaining habit, voluntary action, and sensory impressions and thought as such. They appear to demand explanatory concepts such as pleasure and pain, evaluation, control priorities, preferences, desires.

This psychological perspective has two interconnected implications. One: its focus is on phenomena manifested or felt by individuals. The other: explanations require hypotheses about intra-personal causal processes. "Emotion", first of all, serves as a shorthand for, or pointer to, intra-personal processes and mechanisms. It thereby also points to a human and animal system architecture that enables such mechanisms (Sloman, 1987).

The notion of emotion thereby serves to resolve discrepancies between what people do or feel, and the events surrounding them: between the immediate cues for why they do what they do what they do and what they actually do, between what they do and what they say, and between what they do and what seems appropriate, most useful, most reasonable and well-organized, --and between what they do and what they profess to know what they should do. It serves to help understanding that different people react in different ways to the same situations, and one given person to one given situation on different occasions.

The task of the psychology of emotion

The psychology of emotion has the task of describing features and patterns of phenomena that qualify as “emotional”, and of explaining them in terms of underlying processes and the species’ and individuals’ process repertoires. Explanations include operating characteristics such as sensitivities and thresholds, processing and response repertoires, and attentional and energetic resources. They also include analysis of the various kinds of information that these processes have to work with. Some of that information is received from the environment; some is generated by the individuals’ bodily processes; and some comes from the individual’s store of representations of facts, cognitive schemas, and behavioral skills. The

psychological point of view focuses intra-individual processes, even if these may represent convergence points for influences of socio-cultural origin.

Explanations can formulated at different levels of description. Dennett's (1987) distinguished an intentional or phenomenological level: description in terms of feelings, aims, desires, expectations; a functional or properly psychological level: in terms of habits, programs, information processing procedures, and memory stores; and a hardware or neural and neurohumoral level.

Within each level, there are gradations of integration of elements, and corresponding levels of description. There are neurons, neuron circuits, and neuro-humoral systems. There are muscle twitches, movements, and actions at many scales of hierarchical complexity. There are momentary feelings of discontent, and feelings that the world is heading toward its ruin. The descriptions may not immediately reflect the underlying integration and complexity. Suffering from foreseeing world's doom is not necessarily a more complex feeling than suffering pain in one's toe. Only the foundational processes are and, of course, the explications of the feelings and their implications for behavior.

These relationships complicate the task of psychology. Operation, properties, and effects of more integrative phenomena usually cannot be meaningfully reduced to some combination of those of the founding elements, or be predicted from the latter. They may possess emergent properties such as a sense of agency or of being affected (Metzinger, 2003). Founding elements may change their operation within the integrated whole, in what has been called "circular causation" (Lewis, 1996). For instance, the effects of emotional feelings on thought may drastically differ from the mere effects of somatic feelings, even if the latter are among the foundations of the former.

Among its explanatory tools, psychology of emotion includes the dynamic interactions of the individual with its environment, that bring sensory stimuli in from environment and body, and that produce effects on how smoothly one's facilities and processes function, and that produce effects on the environment and feedback from the latter.

Psychological explanations of emotion phenomena thus are composed of three terms**:** the structure (properties, capacities, propensities) of the individual; incoming and stored information; and on-line dynamic interaction with the environment. How the emotional phenomena emerge from what corresponds to those three terms raises several other of the perennial problems that Arnold had alluded to.

The three terms can be combined in an indefinite number of ways. Theoretical orientations differ in emphasizing one or another of them. Classical behaviorism favored structural simplicity together with simple rules of information acquisition; McDougall's innate instincts theory formed a contrast. In emotion theory proper, Mandler"s (1984) view explains emotion with few structural provisions: emotions are viewed as arousal responses triggered by goal interruption. Russell's (2003) core affect theory likewise requires only pleasure-pain and activation provisions as basic elements. Both theories contrast with Ekman's (1992) highly structured neurocultural theory of basic emotions, and with that of Öhman and Mineka (2001) that, for instance, posits an evolved fear module, innately sensitive to particular sets of stimuli. Striving for structural simplicity is reductionist. It seeks to follow Occam's razor: be as stingy with structure as possible. Complexity is motivated by the effort to account as fully as can be for phenomenal variety. Dynamic interaction seeks to combine structural simplicity and richness of phenomena.

All efforts at description and explanation aim to find regularities among responses, and in the links between antecedents, responses, and further outcomes.

The regularities, hopefully, indicate causal laws, such as “all emotional reactions are instigated by appraisal processes” or “anger is the inevitable consequence of frustration”. However, it may well be that true laws cannot be found at any integrative level of description. Elster (1999a) argued that, there, explanatory rules must have and do have a limited scope, and are subject to unspecified restrictions. They are rules, not laws; Elster calls them "mental mechanisms". Their limitations are due to the fact that the conditions under which each rule applies cannot be strictly specified because of the chaotic nature of psychological causation. Elster illustrates the argument with the following pair of rules. Rule 1: tyranny decreases the likelihood of rebellion; rule 2: tyranny increases the likelihood of rebellion. Both are true; however, their respective conditions cannot be exhaustively specified because of their unbounded context-dependence that can make balances reverse.

What are emotions?

Emotions thus do exist. That does not imply, however, that these phenomena justify a single concept, or form a natural class. The underlying processes or provisions may not possess sufficient unity and specificity. In that sense one may repeat the question: do emotions exist? Do the phenomena justify assuming a distinct function of Emotion, separate from Cognition and Conation, as an older psychology would have it?

Specificity and unity of emotions are commonly assumed; the assumptions are not necessarily correct, however. Nor are they universally held. James (1884) did not adhere to the specificity one. Emotional behavior, in his view, does not to differ from other behavior called forth by key stimuli. He supposed it to originate in the cerebral cortex, just like all other behavior; it took Cannon’s work on subcortical mchanisms to prove him wrong. Neither did he give emotional feeling any special status: it just

consisted of body sensations resulting from feedback from movements and other bodily response. Other investigators also argued that there is nothing specific in emotion experience. For instance, "emotional experience is a highly variable state [and] often partakes of the complicated nature of a judgment" (Landis and Hunt (1932, quoted by Hebb, 1949, p. 237). Duffy (1941) took a different non-specificity position. What are being called emotions are just the high and low levels of activation, with no qualitative property separating them from the emotionally neutral middle range.

One may also deny the unity assumption. Dumas (1948) and Hebb (1949) denied that goal-directed reactions such as angry attack or fearful flight have anything in common with the diffuse ones of mere upset or excitement, or of emotional shock, and behavioral disorganization. More recently, LeDoux (1996) suggested that the various emotions may not involve shared mechanisms.

There are good reasons to raise the unity and specificity issues. The central problem is the modest agreement about which features so-called emotions might share. Bentley, in the paper mentioned earlier, concluded: "Well, emotion is at least a topic! It is something to talk about and to disagree upon." (Bentley, 1928, p. 21). The main problem is that the features mentioned in my first section –passivity, feeling, driving force etc.—as well as the various behavioral, experiential, and physiological response aspects do not strongly vary together. They each define overlapping but non-identical sets of responses. Theorists select different features for their definitions, which definitions, by consequence, are numerous and may diverge widely (Kleinginna & Kleinginna, 1981).

In some definitions, the essence of emotion is feeling, notably those of pleasure and pain. Affective valence is commonly regarded as a criterial aspect. Emotions, say Ortony, Clore, and Collins (1988), are valenced reactions, or conscious

experiences of events with valenced meanings (e.g., Elster, 1999a). Affects, pleasure and pain, certainly set the experiences in which they occur apart from all other kinds of experience, if only because, as feelings, they cannot be readily reduced to something else like cognitions or body sensations (Frijda, 1986, 2007). Yet, conversely, many valenced reactions are not usually classed as emotions. Tasting sweet substances merely produces a pleasant sensation that usually is not regarded an emotion. Inversely, some reactions are often considered emotions while not involving pleasure or pain. Surprise and wonder are among them. But, precisely for that reason, Spinoza (1677) did not include them among the emotions; to him, they merely were cognitive reactions.

Even feelings may not be held criterial for emotions, though. Emotions occur even in lower animals, according to behavioral criteria. Valenced reactions – acceptance and rejection, pursuit and avoidance-- occur without awareness. They occur in insects and fish. They occur in humans in response to pleasant and unpleasant stimuli that are not consciously perceived. Backward masking of such stimuli may lead to subsequent affect ratings (e.g., Zajonc, 1980), or even to enhanced consumption of liked drinks (Berridge, 2004).

But the latter findings point to a level of analysis that might enlarge the domain of responses that share pleasure or pain: by viewing the feelings as but one kind of expression of underlying processes that Berridge has called “core pleasure” and “core pain”; the latter are also expressed in readiness for event acceptance or rejection.

Pleasure and pain, in turn, result from a still larger process domain: that of appraisal. Appraisal processes are defined as intra-subjective processes that turn incoming stimulus events into ones with affective value and further meaning for wellbeing and motive satisfaction (Lazarus, 1991). Event appraisal could be

considered one of the basic abilities of human and animal systems; emotions can therefore be defined as processes that involve appraisal. Appraisal processes vary in kind and complexity, ranging from immediate, automatic affect arousal (stimuli may directly evoke pleasure or pain because one has innate or acquired dispositions to do so; LeDoux, 1996), to complex integration of cues for promotion or obstruction in achieving goals and safeguarding concerns. The latter are often designated as "cognitive appraisals" (e.g., Lazarus, 1991; Oatley, 1992; Scherer, 2001; Stein & Trabasso, 1992). Because of the role of appraisals in emotional feelings and action instigations (Elster, 1999a; Scherer, 2001), emotions haven been defined as kinds of judgments (e.g., Nussbaum, 2001). However, regardless of complexity, appraisal processes mostly proceed automatically and nonconsciously, even if one is often aware of their outcomes (Bargh, 1997, Zajonc, 1980). Obviously, the extent to which felt and overt responses are taken to share the processes of appraisal depends on one's level of analysis and theoretical interpretation.

Another domain that looms large in efforts to define emotions is that of motivation. Emotional behavior as well as felt emotions strongly suggest prominence of urges to act, desires, motive states including those of loss or decay of motivation, as observed in emotional confusion and depressive apathy. Motivation was central in older emotion theories, such as those of Thomas Aquinas, McDougall (1923), Tomkins (1962), and Wallon (1942), and more recently Magda Arnold (1960). The motivational side of emotions has been lost very much in more recent theoretical attempts.

Yet, motive states as occurring in what we call emotions are rather specific for them. They are triggered by events as appraised. They are felt as urges and lead to impulsive actions, which means that they do not result from planning and are little controlled by foresights. They command actions that are not premeditated. Impulses

to act represent a mode of action instigation and control that differs from that of automatic and habitual, as well as that of planned behavior. Impulsive control of action was indeed prominent among the phenomena that gave rise to the emotion-like notions.

Emotions can be regarded as passions, as defined as event-instigated or object-instigated states of action readiness with control precedence. States of action readiness are states of readiness for actions to maintain or modify one's relationship with the world or oneself, including loss or decay of motivation to relate (Frijda, 1986, 2007). Readiness implies being set for action if and when appropriate conditions arise, and if relevant actions are available in one's action repertoire. Some states of action readiness are diffuse and have no aim other than to relate or not to relate in general; they are called activation states. Besides apathy, diffuse excitement and unfocused receptivity, as in some states of meditation, are examples. Other states of action readiness have the aim of achieving, maintaining, or modifying one's relationship to a particular object or event in a particular way: by seeking proximity, by moving away or protecting oneself, or by moving against and blocking interference. They are called action tendencies, and command actions that can fulfill their aim.

Action readiness is conspicuous in event-triggered actions that a definition of emotions by pleasure and pain would leave out. Desire is the clearest instance, since many desires are not guided by foresight of pleasure, nor do they seek to escape from pain other than that of unfulfilled desire. Surprise and wonder are further instances that were already mentioned. Conversely, emotions defined by action readiness do include instances of pleasure and pain that produce some change in action readiness: hunger that leads to restlessness and urge to find food, and craving for something irresistibly attractive.

Many reactions considered “emotional” do not show much overt action. States of action readiness may remain just that: states of readiness. However, the actions that action readiness is readiness for include cognitive actions: changes in beliefs. Emotions have been defined by Aristotle as well as by Spinoza as inclinations to think one way rather than another.

Such cognitive actions share with overt actions one of the defining aspects of passion and action readiness: they are not initiated by voluntary planning, nor can they be readily modified at will. By contrast, they possess the feature that I have termed “control precedence” (Frijda, 1986, 2007). They tend to take control and overrule other actions or action instigations,-- the passivity aspect of passion. They not only command actions to fulfill their aim, but also are set towards achieving that aim in the face of delays, obstacles and other difficulties, turning action into persistent striving. They seek precedence over ongoing behavior or interference from other sources

Perhaps the major feature of passions, their emotionally driven actions and their belief changes is their being reward-insensitive (Elster, 1999b). One tends to do certain things, in love, in hate, in greed, and in addiction, even when one knows that only bad things will come from it. One shrugs one’s shoulders for the latter. By contrast, passions are stimulus-governed: one feels irresistibly drawn to good-smelling food, to unattainable but attractive sexual targets, to, in proportion to their perceptual salience (Frijda, 2007). The smell of alcohol, the cues for a heroin shot, and the sight of a syringe may fill the addict with frenzy (Berridge, 2004). This aspect of impulsive action control is lawful: feeling and action instigation are inverse hyperbolic functions of temporal distance to the target in time. Ainslie’s (2001) law of time discounting describes the “breakdown of will” when facing temptations, and the null effects of mere warnings of future misery. Hume said that reason is emotion’s

slave. That may not be entirely true (Solomon 2004). One can to some extent control one's emotions; one can even to some extent choose them. But even if one is not truly passion's slave, one certainly is not their master.

Viewing the central role of motive states in emotion resembles the view that defines emotions by activation of largely innate action systems, each with a particular adaptive function (e.g., Bradley et al., 2001; Buck, 1999; Damasio, 2003; Öhman, this volume; Plutchik, 2001). Both views presumably cover much of the same behavioral phenomena, except that the action system view is silent on the behavioral and motivational dynamics, and the action readiness view is silent on the provenance of modes of action readiness and the action repertoires.

So far: various bases for defining emotions. What specifies and unifies the reactions with the phenomena discussed may not, however, be one or the other of the various components, or even a particular combination of them. "Emotion" can perhaps best be taken to designate any process in which the various components are intimately connected. The concept properly fits states of synchronization of several components (Scherer, 1999). "Synchronization" here does not mean fixed linkages between particular components but, rather, that the various components flexibly influence each other. In flexible fashion they represent a unitary reaction of the entire system. Synchronization in this sense is involved whenever appraisal and whenever action readiness are evoked, and when control precedence is operative. The three tend to be coupled, and tend to call a number of further components such as autonomic arousal and cognitive orientation.

The emotion concept

As there are arguments to restrict the domain of emotion (smaller than all impulsive motor reactions, such as startle; smaller than all affective responses), there also are arguments to enlarge it.

There is a large class of emotional phenomena called emotional attitudes or sentiments (Arnold, 1960; Shand, 1920). They are usually treated as distinct from emotions. Being frightened of dogs and being afraid by a nearby dog are not the same sort of things. The distinction is that between occurrent states and dispositions. Emotions have a limited duration; sentiments may persist over a lifetime. But nevertheless, occurrent emotions and sentiments are not totally separate. Emotions and sentiments have the same structure. They can both be characterized by an object, its appraisal, and a particular propensity to act in relation to the object,– latent, dispositional propensity in the case of sentiments, and acute, occurrent propensity in the case of emotions proper. Also, sentiments are not all that dispositional. One can feel that one fears dogs and that one loves one's beloved. One can know that one fears dogs or loves one's beloved, and act accordingly, by avoiding places where one knows a dog to live and by going upstairs to embrace the beloved. One can also know that the sentiment may turn into an emotion at the slightest provocation. One may, in other words, join sentiments and occurrent emotions together in one emotion category, contrary to what Kenny (1963) proposed. Some authors in fact do that.

The preceding section was mainly concerned with the definition of emotions. So does much debate in emotion theory. That debate can be considered an unprofitable undertaking. Natural processes of any complexity are not tailored into discrete categories. The question whether or not someone has an emotion nevertheless is sometimes meaningful. It comes up when wondering whether a given reaction is a "false” or faked emotion. This has a moral or legal side: has some act been committed "coolly" or "with emotion"? There also exist imagined and empathic

emotions, and anticipated emotions like anticipated guilt, shame or regret that exert powerful social control (Harré & Parrott, 1996), and that may be absent in some individuals like psychopaths.

However, the multicomponential nature of emotions entails a looseness of structure that best fits viewing a category “emotion” as only a shorthand. So may the distinctions between emotions and sentiments and between feelings and moods. Distinguishing categories reflects the general problem of using “substance concepts” (or thing-concepts) instead of function concepts, when trying to organize continuous and continuously varying phenomena. Emotions indeed are often treated as thing-like states. Language sustains this: emotions are usually referred to by nouns. That may be useful in social communication. For psychological analysis, however, it might be better to treat emotions as the observable results of processes that are better denoted by verbs. "She is angering" might not be a bad expression, which neatly matches “she has been angered”, as of course is “she is loving”.

Instead of talking about emotions, one might instead describe streams of concurrent and interacting ongoing processes: appraisals that last and change, that activate processes of action readiness that generate action preparations and overt actions that act back upon appraisals, that all vary in degree of activation, and that each have different time courses and different moments at which they die down. This is the picture sketched by multicomponential emotion theory (e.g., Scherer, 2000), according to which matching categories to ongoing processes – “an emotion”, “a mood”, and even “anger!”, “excitement!” – can only be sloppy, often a bit arbitrary, and not very consequential except for verbal communication.

That category labels are useful in verbal interaction does not imply, incidentally, that they are needed for nonverbal communication. States of action readiness, degrees of activation and of control precedence of feelings and action

urges can be grasped directly by an observer, and probably be copied directly in motor empathy (Gallese, 2005). In psychological analysis, too, the various phenomena can be described directly in terms of the ongoing processes. All these processes are graded in strength, and making cuts at certain levels of strength is arbitrary; that, of course, was the moral of Duffy's attack on the emotion concept. Her analysis was limited by its focus on activation. The same applies to other emotional processes, such as action readiness, appraisals, control precedence. Degree of articulation of an intentional object, for instance, can be considered a parameter. Its introduction would turn the distinction between emotions and moods into a continuum of emotionness versus moodness.

Emotion instances

So far, I here referred to emotions as modes of acting and reacting, or as modes of feeling and doing. This is decidedly vaguer than calling them “responses” or “reactions”.

There is, however, good reason to do so. What we use words like “emotion” for are usually complex response patterns spread out over time. Their components show variations in duration and time course. Brief facial expressions occur alongside longer-lasting changes in heart rate or respiration, interspersed with flashes of strong feeling against a background of feeling that waxes and wanes.

The observable and experienced phenomena can in fact be described at very different levels of analysis and integration. One can describe single response components such as a smile or an angry facial expression. One can describe more or less coherent expressive and behavioral sequences, such as a series of fearful movements when facing an ongoing frightening event, or of various angry expressions –a scowl, a glare, a deep frown, a clenching of fists– during a hostile

interchange. One can observe a sequence of behavior and feeling modes that all center around dealing with a particular event, such as viewing something with apprehension growing into alarm turning into anger then calming down to mere watchfulness. Such sequences form emotion episodes.

Emotion episodes like the latter are in fact what subjects usually recount when asked to recall some emotion instance (Frijda et al., 1991). Episodes usually include several emotions (Oatley & Duncan, 1994). All this is obviously relevant for the question of what represents an emotion instance, and how long emotions last. Such duration depends on what one focuses on. It may be 5 seconds at most, for an individual facial response. It may be an hour for a hostile or fearful interchange. It is up to days or longer for emotion episodes that continue over restless dream-ridden sleep. It is up to a lifetime when extending the emotion-notion to sentiments and their latent readiness for emotions in the acute, occurrent sense (Frijda, 2007).

It is a bit a matter of taste how long one considers an emotion to last, since emotions of any personal importance tend to entail extensions. They may instigate the individual to ruminate, or to walk around pondering revenge or how to restore self-esteem, or engaging in social sharing of one’s emotion (Rimé, 2005). It is not immediately transparent when an emotion terminates, since all components may do so at different moments; lowered thresholds –irritability, rapid tears—may outlast all more manifest ones. It is also a matter of taste which of the phenomena discussed are considered as belonging to the emotion itself, and which to its antecedents or consequents (e.g., Dumas, 1948). Conscious appraisal is as much part of the emotion as an antecedent for action impulse. These questions clearly lose much of their sense when "emotion" is understood to refer to a collection of interacting processes, and not to a single or a solidly integrated entity.

Emotion instances thus can be viewed at very different levels. That is why “response” or “reaction” is not the best designation for an emotion instance. Most instances are complex. Actions and feelings in a particular emotion form part of interactions and interchanges. The emotions thus can thus be viewed as intrapersonal states of feeling, arousal, activation and so forth, but also as the individual’s share in an interactive occurrence that involves dealing with another person and one’s mutual relationship. Which level of analysis is selected can have appreciable consequences. Focus on feelings, for instance, readily loses sight of the intentional nature of emotion,-- its being, and being experienced as, an event between me and the other (Lambie & Marcel, 2002). Focus on motor responses may, in experience and in analysis, turn an action into a mere movement.

Analyses at different levels are compatible; they co-exist. However, incompatibilities may arise when emotions are categorized on different levels. One cannot, as a rule, without loss reduce descriptions at some higher, more integrative level to a combination of its more elementary constituents. Jealousy, as pain caused by rivalry, is not just pain, nor is it just anger, nor is it just despair, but it is an interpersonal pain that can change its face at any moment. Likewise, higher level categorizations cannot always be built up from the lower level phenomena. Higher level categorizations often, or perhaps usually, include more phenomena, as well as more interactions between the lower level phenomena, or feedback from them. Indignation is more than anger with a moral overtone, since it is felt as carried by one’s moral values rather than by one’s personal interests.

Noticing that emotions are streams of independent but interacting processes raises questions about the nature of these interactions. Process analyses suggest that processes that logically follow from certain other processes still, by their feedback, may influence those latter. Facial expressions that respond to appraisals in turn

influence appraisals. The expected effect of one's emotion on others influences actual occurrence of that emotion. Processes may produce a higher-order outcome –say, a categorization of one's state—that then controls and modifies logically prior processes, say appraisal. Such processes have been called processes of vertical causality. Emotion processes thus are not linearly organized. A non-linear dynamic model is called for (Lewis, 1996, 2005). It better accounts for how emotions actually proceed and obtain and modify their shape.

The interactions suggest that given subprocesses do not follow each other in a very regular manner, even if the links are lawful. The actual linkages are sensitive to a host of feedback influences, and influences from various levels. Whether certain stimuli actually elicit certain responses, or certain appraisals certain emotions may strongly depend on secondary conditions such as personality, mood, the state of the organism, and coincidences in the physical and social situation. These secondary conditions may be so important that a model involving chaotic determination may be more satisfactory than the usual linear model. It also is what makes Elster's (1999a) mental mechanisms better explanatory tools than laws in a strict sense.

How to distinguish emotions?

How to properly or profitably distinguish different emotions? Verbal categories have been used as the starting point, since some of them suggest elementary entity. Some emotion labels have indeed been interpreted as reflecting elementary, irreducible feelings or *qualia*, with other labels representing their blends or subspecies (Izard, 1977; Oatley, 1992). The feelings might reflect, or be part of, basic organized component structures including motivational states (e.g., Oatley, 1992), action and expression patterns (e.g., Ekman, 1992; Izard, 1977; Tomkins, 1962), and patterns of physiological reaction (e.g., James, 1884). The feelings might

not be irreducible *qualia*, but themselves patterns of values on two feeling dimensions of hedonic tone and activation,--variants of “core affect” (Barrett, 2005; Russell, 2003).

There is no a priori reason why verbal labels should offer a good clue to distinct emotions. Languages differ in their taxonomies, and verbal labels may reflect eliciting contingencies rather than modes of feeling and doing (e.g. likelihood of certain social sanctions or particular rewards).

Several hypotheses on how the various components are related and organized have oriented research. In one major hypothesis, the various components form solidly coherent packets, each based on a common neural and neurohumoral disposition. Activation of the dispositions by events jointly activates the various components. This basic emotions hypothesis exists in several variants (Buck, 1999; Ekman, 1992; Izard, 1977; Öhman, this volume; Panksepp, this volume; Tomkins, 1962). Such a hypothesis finds support in indications for the existence of dedicated brain circuits and neurohumors (Panksepp, this volume), apart from the unstable evidence for label-specific facial and other expressions (Ekman, 1992; Izard, 1977); but correlations in the occurrence of various components tend to be moderate or weak (Scherer, 2005).

A second hypothesis starts from that latter finding. The “multicomponential view” (Scherer, 2000) views emotions as more or less unordered collections of components, jointly activated by how the emotional event is appraised and individual component propensities. Emotions can occupy almost any position in a multi-dimensional space with as many dimensions as there exist components. Each component is activated by separate external conditions or aspects of the event-subject interaction as appraised (Ortony & Turner, 1990; Scherer, 2001).

This second hypothesis leads to abandoning the very notion of distinct emotion types. Each emotion instance stands on is own. Emotions just are bundles of

component processes. Emotion labels just loosely and fuzzily cover subregions of the multicomponential space, or cut out such subregions themselves by culturally, linguistically, or ecologically determined prototypes or scripts linked to them (Russell, 1991). Several theorists have taken this second option. Emotion labels are viewed as arbitrary distinctions in a more or less unstructured domain (Mandler, 1984), reflect ecologically frequent or socially important patterns of components (as in Scherer's, 1992, conception of "modal emotions"), or cultural concerns and values that give emphasis to some, and not to other, sets of feelings and modes of behavior (e.g.social constructivist theory, see Harré and Parrott, 1996).

The multicomponential view appears better able to deal with cultural differences in emotions taxonomies (e.g., Lutz, 1988), and with differences in the precise semantic content of similar categories in different languages (such as "anger" in English and "ikari" in Japanese, or “shame” in English and “hassam” in Arab).

On the other hand, a basic emotions view more readily handles evidence suggesting that certain emotion categories are very common (Mesquita, Frijda, & Scherer, 1997), and may even occur in most or all languages (Hupka, Lenton, & Hutchinson, 1999; Shaver, Wu, & Schwartz, 1992; but see Russell, 1991).

The two hypotheses may not be as dissimilar as they seem, though. The basic emotions view has ample room for cultural differences. Basic emotions can be considered to represent functionally defined classes (Ekman, 1992). Within each class, the precise antecedents, nature of the objects, full gamut of appraisal components, precise type of action goal or action to deal with the appraised contingency, as well as emotion significance (see below), all may vary. They all provide the leeway that cultural and individual differences require. More pertinent still is the fact that any component –facial expression, autonomic reaction, action tendency—is the joint outcome of the emotion disposition as such, and of facilitation

by situational and other momentary factors. Respiration rate is influenced by excitement as well as by moving fast. Smiling flows from pleasure and from desire to please. The moderate correlations between components can be readily accommodated within the basic emotions view.

Conversely, even within the multicomponential hypothesis, the componential space is not at all fully unstructured. Many components mutually constrain or entrain each other. There exist coordinate structures. Vigorous action requires sympathetic energy arousal, and readiness for it prepares it; feeling consists in part of feedback from autonomic and skeletal responses and from states of action readiness; motor relaxation and high autonomic arousal are incompatible; and so forth.

In a third, hierarchical approach, components differ in their organizational power. Some are more central than others. Pleasantness and unpleasantness may each cascade into collections of separate subsystems and component streams (Bradley et al., 2001). Action tendency may well organize all other components for implementing its aim. It would fit the functional interpretation of different emotions as different, specifically focused adaptive provisions (Damasio, 2003; Frijda, 1986, 2007; Plutchik, 2002).

The multicomponential and hierarchical approaches follow the shift from categorial to process conceptualizations. That shift extends from the phenomena of emotions as such to the emotion components themselves. Many components are best dissolved into smaller components and their variable conjunctions. This has appeared necessary for “autonomic arousa|”: no valid consistent index has been found, because indices do not strongly covary (Levenson, 2003; Stemmler, 2003). The same has been argued for facial expressions. Most patterns, even those presumably typical for particular emotions, are best understood as built up from individual facial action units that each can be considered functional units, such as serving protective, attentional,

force-assembling functions (e.g., eye-narrowing, eye-widening and vertical frowning respectively, in these three examples) (Camras, 2000; Ortony and Turner, 1990; Smith, 1997; Scherer; 1992). In any case, shifting from category to process approaches turns the relationships between components into a subject for unprejudiced research on several basic questions. Which processes are linked to which other processes, and to which degree? Which linkages are due to joint response to the same antecedent contingencies and which to their forming coordinative motor structures? Which linkages represent functional dependence? Which represent the effects of a shared command system? (Lewis, 2005).

The relations between emotion and motivation

The relation between motivation and emotion forms another of the perennial problems. Many emotions form motivational states, but many motivational states (e.g., need for food) are not emotions. This has led some investigators (e.g., Bindra, 1959) to abandon the emotion-motivation distinction. This does not appear justified, however, because there is a real distinction that counts.

The term "motivation" suffers from a polysemy that is similar to that for "emotion". It, too, has an occurrent reading –emotions proper-- as well as a dispositional one, referring to sentiments. When saying that one’s social motivation leaves one unhappy when alone, a dispositional reading is meant. Saying that felt loneliness motivates one to seek company implies an occurrent reading; loneliness is an emotion. “Motivation” thus can label a cause, a consequence, as well as an aspect of emotions. It is a cause in its dispositional sense, and a consequence and/or aspect in the occurrent one.

This type of distinction can generally be considered fruitful. McDougall (1920) distinguished dispositional "instincts" from emotions as their actualizations.

Buck (1999) calls emotions the “readouts” of motivation. Oatley (1992) distinguishes "goals" from emotions, with the latter identified as the responses to contingencies in achieving or not achieving goals. Goals, in this context, function as dispositions that drive the occurrent emotional motivations to reach them.

Such distinction is important. Dispositional motives (I call them “concerns”; “interests” is a useful alternative) belong to the major explanatory notions for emotions (with “action tendencies” as the latters’ occurrent motivational component). Concerns are what render events and objects emotionally relevant in the first place. Psychology of motivation forms the cornerstone of emotion analysis. Why do we seek and enjoy company, and why does loneliness makes us sad? Because being with and interacting with others is a concern. Concerns of course also form the cornerstone of dynamic exploration of emotional conflict: conflict flows from incompatible concerns, like desiring wealth and estimating personal decency.

The two senses of “motivation” are not always easy to tease apart, though. Is “love” a dispositional or an occurrent motivation, a concern or an emotion? And what about being in love? Both obviously can be both, the former more continuously, the latter more intermittently.

Emotion elicitation

What elicits emotions? The simplest type of answer is that different emotions are evoked by different kinds of event,-- each emotion by a different one. In behaviorist parlance: emotions are different reflex-like response patterns to different unconditioned stimuli. The range of elicitors then is augmented by the usual conditioning constellations. This was Watson's (1929) answer. It is still dominant in

emotion explanations from evolutionary psychology and evolutionary orientation generally (e.g. Bradley et al., 2001; Cosmides & Tooby, 2000, Öhman, this volume).

Later behaviorism and more recent analyses refined the type of explanation a bit. Stimulus events are pleasant or unpleasant, or represent rewards or punishments. They may have come to do so by evolutionary selection or by actual need or concern satisfaction or frustration. But different emotions are aroused when rewards are embedded in constellations involving the temporal context: their advent, decrease, or omission (Bouton, 2005; Gray, 1987; Mowrer, 1960; Rolls, 2005). This refinement has been extended to include further context aspects, such as previous reinforcement of particular responses to deal with the event, or their previous non-reinforcement (Gray, 1987). In appraisal approaches, the context variables are formulated in cognitive rather than contingency terms. They are designated as “appraisal components” (e.g., Ellsworth & Scherer, 2003). "Appraisal of coping resources", as a component of emotion antecedents, thus is largely equivalent to previous reinforcement or nonreinforcement of coping responses. What differs between behaviorist and cognitive approaches is the process by which one or the other emotion is supposedly evoked: linked more strongly to environmental events in behaviorist theory, more to subject-bound processing variables in appraisal theory.

A major somewhat different conceptualization starts from the mentioned central place of dispositional motivation in behavior, rather that of stimulus-response connections. This conceptualization posits processes of appraisal of goal- or concern-relevance of events or, for short, of relevance to well-being (Lazarus, 1991; Oatley, 1992; Stein & Trabasso, 1992). Those events elicit emotions that are appraised as beneficial or harmful for achieving the individual’s well-being. This conceptualization seeks to account for positive and negative reward values, or pleasantness and unpleasantness of events, from a general perspective. It implies a

different account of the basic mode of operation of human and animal systems. In the end both approaches may turn out not to be as different as they seem, since the definitions of “unconditioned stimuli” and “states of satisfaction of concerns” may not always be so drastically different, as evidenced by Hull’s (1953) notion of “drive reduction”. On the other hand, their emphasis differs. Sensitivities for the various concerns are, by their nature, more general than can be formulated as sensitivities for sets of discrete stimuli. “Novel” stimuli (that trigger curiosity) present a case in point: novelty is not a stimulus attribute. Likewise for interpersonal warmth, and for relevance to self-esteem.

The emotional efficacy of eliciting events cannot always meaningfully reduced to “unconditioned” stimuli contained in or signaled by them. Reduction is often problematic. Several elementary event types may converge on a given higher-order sensitivity. Personal loss elicits sadness because it implies loss of personal warmth, of protection, or of soothing stimuli. It may elicit sadness by any mixture of those. The stimuli may have nothing more in common that that they all engage an interpersonal intimacy-achieving system.

Moreover, events are not always emotionally efficacious because the stimuli they contain or signal. Some are by enabling or obstructing exerting particular skills and competences. Novel stimuli may be pleasurable (when they are) because and when they enable cognitive assimilation skills (Frijda, 2007).

Emotion elicitors can be more profitably understood at some intermediary level between specific stimuli such as painful stimuli, mutilated bodies, snakes, or spiders, and the general level of being negative and positive rewards. “Concern relevance” points at emergent properties that neither reside in the positive or negative stimuli as such, but in a more involved interaction. Exploring why certain stimuli or actions are rewarding or aversive –receiving a gift or giving one (Mauss, 1914),

being sensitive to a magic curse, shrinking back from seeing mutilated bodies—forms a challenging task for emotion psychology.

The origins of emotions

Nature or nurture? One of the perennial problems in emotion again. How much in phenomena that suggest "emotion" is due to provisions and constraints laid down in the mechanisms with which humans are by nature equipped? How much, or what in the precise sets of phenomena that are labeled as joy or fear? How much, and what is a result of individual learning, social shaping, and social pressure?

Nobody, I think, contests that emotions have biological bases. There is compelling evidence of neural and neurochemical mechanisms (see LeDoux, this volume; Panksepp, this volume). Basic phenomena and underlying processes – unlearned action systems, appraisal processes, pleasure and pain, control shift provisions– extend beyond the human species over many other animal species. Some may extend over invertebrates.

Indications for several different emotions are shared by most or all birds and mammals. The indications include evidence for dedicated neural and neurohumoral circuits (Buck, 1999; Panksepp, this volume), and for action systems with particular functions: for approach, for establishing close non-hostile interaction, for hostility, for escape and avoidance, for active rejection, for behavioral inhibition. As I did mentioned, verbal emotion labels that imply reference to them occur in most or all languages.

Cross-species and intra-human generalities offer strong support for evolutionary arguments for some or most of all the preceding (e.g., Ekman, 1994). These arguments are strengthened by the adaptive utility of the behavior systems linked to the emotions: protecting from intruders, predators, and rivals; warding them

off and threatening them; obtaining food and drink; detecting and contacting mates; seeking shelter; protecting the young; submitting to the more powerful. For all of them, utility in promoting reproductive fitness, is obvious or can be readily constructed (Buss, 1994; Cosmides & Tooby, 2000).

Nevertheless, reservations are in order. It is so far rather unclear what precisely the various neural circuits do in functional terms. Do extended amygdala circuits link affective appraisal to particular stimuli or contingencies, or to sets of prewired motor programs, or to motivational reactions that activate motor programs that have been shaped in other than specific emotional contexts? The latter is not unlikely.

By itself, universality in fact does not prove biological origin. Major emotions correspond to sensitivity for universal contingencies or core relational themes such as threat, loss, competition, or success (Lazarus, 1991). Universal contingencies themselves present universal occasions for learning, and for universally similar modes of problem solving and dynamic compilation of action patterns. Take anger, for example. Its behavior repertoire could be explained by the facts that harm is universally painful, and that one is equipped with several sorts of actions that can produce external changes, and social changes in particular. Kicking, scratching, throwing objects, shouting are useful within emotional contexts, as when chasing intruders, as well as outside such contexts, as when cracking nuts, breaking branches, and throwing over one's companions in play. Instrumental behaviors have an applicability range. The efficacy of such actions can be discovered in the dynamic contexts of hostile, playful and instrumental interactions, in the same way that a baby discovers the possibility of walking when body weight and muscle strength have reached the right relationship (Thelen, 1985). In other words: universality can be explained in more than one way. Biological roots are still involved, but may well

reside at deeper or more elementary levels than being roots of emotional response patterns as such.

And then: even if biological roots are involved, it may not be easy to assess what they are. Mother-child and child-mother attachment no doubt have such roots, but which are they, and what is their role? Western attachment theory and findings, on close scrutiny, may reflect more culture than prima facie likelihood suggests. Independence may not be a general component of the attachment system, but one more characteristic of the Western world (Rothbaum et al., 2000).

Biological dispositions, moreover, need inner and outer environments to take behavioral and experiential shape. It may be useful to stress that the role of cultural differences in emotional phenomena depends to an important degree upon one's level of analysis: how deeper the level, how larger the generality (Mesquita, Frijda, & Scherer. 1997). What is usually translated into English as shame differs strongly in social role and behavioral implications between Western and Arab cultures; yet both flow from a similar sensitivity for being socially accepted and involve a similar motivation to correct one’s deviations from acceptance. But again, they strongly diverge in what represents such deviations, and how to correct for them. Cultural prescriptions and models provide such shaping, and it may even shape the motivation to such an extent that the emotions are not recognizably similar (Mesquita, 2002). Symbolic capacities and social interactions both penetrate every phenomenon, its occasions for appearing, and its duration. It largely remains to explore how far that can go, and what the implications of the differences are.

The functions of emotions.

The negative aspects of emotions dominated earlier theorizing in both philosophy and psychology. For Aquino, most emotions belonged to the capital sins.

For Kant, emotions represented illnesses of the mind (*"Krankheiten des Gemüts"*). Several early 20-th century authors considered emotions to be "states of functional decortication" or of neural disorganization (e.g., Claparède, 1928; Hebb, 1949).

In contemporary theorizing, the tides have turned, mainly under the influence of evolutionary interpretations. Emotions are largely being viewed as adaptively useful, or at least, as having been so in the evolutionary past. The functional perspective now dominates.

Considering the evidence for phylogenetic origin and continuity, this functional perspective on emotions is plausible. It is also plausible because of the wide range of likely functions of emotions. It is wider than very directly dealing with individual or species survival or reproductive fitness. Joy can be understood as motivating readiness for novel exploits and expanding competences (Fredrickson, this volume). Anger, shame, guilt-feeling and sympathy are powerful regulators of social interaction (Hoffman, this volume; Manstead & Fischer, this volume). Sadness may serve disengagement from attachments after personal loss. Apparently irrational emotions like compassion and desire for revenge serve adaptive purposes: they represent one's commitment, and signal others that one may act upon them; they thereby outweigh occasional costs in short-term interaction (Frank, 1988).

Evolutionary origin may mean that emotions are now mere obsolete remnants, since original adaptive problems have waned (e.g., nonhuman predators) or rational methods are now available (e.g., precision bombing). Energy mobilization by sympathetic arousal may be wasteful, now that rationally guided mental actions are called for. However, by and large emotions and emotional actions are still generally adaptive in about the original sense. Love still drives sexual reproduction, intimacy is still profitable for child care and social support; fear still motivates prudence; anger still promotes our interests and may discourage rivals. Expressive behavior, it can

likewise be argued, still serves to strengthen relations (e.g., by smiling), discourage offenses (e.g., by bracing, shouting, readying for a fight), and protecting one's body (e.g., by ducking and closing one's eyes). Considerable amounts of work have gone into generating plausible functional hypotheses and assembling evidence (Frijda & Tcherkassof, 1997; Scherer, 1992; Keltner & Busswell, 1997).

Many emotions and emotional behaviors are, moreover, functional in a somewhat different sense. They may not be adaptive in promoting survival, and it may not have been what made them come into existence; but they do have effects for oneself and on others, which keep them going. Joy is an obvious example. It may not help, but it is nice. Similarly for positive excitement and curiosity. They keep boredom at bay, and keep one's competences ticking. Grief may not have any direct advantage, but its anticipation keeps people together. It helps to know they will miss you.

One has to watch out with functional interpretations, though. They are easily found, and the evolutionary perspective almost forces searching for them. Anger? Small wonder if it is innate since it helps protecting one's territory and offspring. Grief? It may well serve to detach oneself from lost attachments. Apathy in grief? Small wonder again: it saves expending energy that would be useless after the loss. Heart rate increase in fear? It was obviously useful when the emotion developed, under threat of rivals and predators, and when one had to be always ready to climb a tree; although its net profit even then can be doubted (Arnold, 1960). Aversiveness of pictures of blood and mutilation? It obviously serves prudence, and thus survival (Bradley et al., 2001). But does it? It might hamper to keep one's enemies off.

In fact, in the ancient adaptational environment no observer was around to gauge the various benefits against the costs that anger, apathy, the wear caused by heart rate increase and fear of the sight of blood might have entailed. Evolutionary

emotion hypotheses rarely examine such implications or possible alternative more dynamic explanations. Emotional phenomena may indeed have originated as mere "spandrels", chance offshoots of quite different potentials (Gould & Lewontin, 1979). "Anger", as I indicated, might largely have emerged as a by-product of provisions for power deployment that developed to crack nuts; moral disgust may stem from a preadaptation for ejecting foul substances (Rozin, 1999).

Functional advantages of emotions can readily be thought; that does not make them true or the emotions' actual origins. Grief may not help anything at all. Grief of loss may be similar to pain in a phantom limb: pain generally is useful, but not all pain is. Depression may be an offshoot when all objects worth striving for have dropped away, and exhaustion has set in because of fruitless efforts to regain; Weiss, at the time, opposed this hypothesis to Seligman's learned helplessness hypothesis (Weiss, Glazer, & Poherecky, 1976). Emotional shock may just represent disorganization due to sudden impact that cannot be managed; that is how Dumas (1984) and Hebb (1949) interpreted it. There is no doubt that emotions, by and large, fulfill profitable functions, but one should not fall prey to the Panglossian fallacy (Gould & Lewontin, 1979). Pangloss, as you will recall, was the philosopher in Voltaire's *Candide* who, upon every misfortune, echoed Leibniz' dictum that we live in the best of all possible worlds. By now we know that we do not. Many emotional events just are beyond human and animal resources for dealing and coping. Such resources are of necessity limited in an 80 kilogram organism that has to be about ready after only 9 month gestation. Disturbance of optimal functioning just can be dysfunctional.

And as noted, emotions that in principle represent functional provisions are often disadvantageous or outright harmful. Emotions can cause suboptimal action. In panic, people press through narrow exits, stage fright spoils performance,

nervousness spoils precision of movement, rage may lead to childish behavior and destroy social harmony (DeWaal, 1996). Parrott (2001) has convincingly shown that whether or not emotions are functional critically depends on adequacy of the appraisals that led to these emotions, on choice and control of behavior that is motivated by the emotions, and on adequately evaluating the impact on others both of the behaviors and one's feelings.

A functional perspective on emotions should not lose sight of the limits within which that perspective holds.

Emotion and cognition.

Traditionally, emotion and cognition have been considered different faculties. They have been put in opposition; so have feeling and thinking. Pondering and raging impress as opposite ends of a continuum.

Contemporary psychology tends to consider these oppositions problematic. The contrasts tend to dissolve upon analysis of how intimately information processing and acting are intertwined, emotionally reacting and appraisal of emotional meanings, goal setting and impulsive aims and desires. Oppositions dissolve at lower levels of analysis, when scrutiny of processes replaces categorial distinctions.

Analyzing the emotion-cognition distinction has frequently been confounded with that between conscious and non-conscious information processing. The distinctions are, however, orthogonal (Clore et al., 2005); I return to the latter one below. But the problems in giving an account of information processing in emotion are considerable, because most of that processing cannot be analyzed with in the way that processing propositional, discursive information can. Cognitive psychology has invented representational tools such as schemas, cognitive networks, and symbolic

representations, and ultimately abstract representations in “mentalese”. These tools do not appear appropriate for information that operates in emotion processes. The term “intuition” is often used (Arnold, 1960); “appraisal” is contrasted with “knowledge” (Lazarus, 1991), –a distinction needed because of the central problem that so much information that is in principle relevant to emotion arousal often fails to arouse, and knowledge that shows events to be neutral still does not prevent emotion arousal. Tools for understanding the processes involved in rendering information emotionally efficacious are emerging only slowly and recently. One consists of recourse to concrete and mode-specific representations and their networks (Barsalou, 1999). Another is recognizing the important role of motor representations, both as underlying identification of emotional meanings in behavior of other individuals, and as underlying action programs, action representations, and action foresight (e.g., Gallese, 2005; Meltzoff, 2002). This is one of the areas that gave rise to extensive recognition of what has been termed “embodied cognition” (Niedenthal et al., 2005). Another tool again, not used yet in understanding emotions, is representation of processes over time, as is being developed in the description and analysis of human movement.

Besides the problems of representing emotional processes and information are those that concern the structures of the involved information. These structures range from simple stimulus-response transductions (that imply representations of stimulus keys that fit representations of particular response-locks), to elaborate multimodal networks of associations, and on to abstract meanings and inferences. Massive research over the last two or three decades has demonstrated how very elementary information can on occasion be emotionally effective (e.g., Zajonc, 1980). It has also been shown how complex it often is (Barsalou, 1999), even when that does not immediately appear to be so by operating nonconsciously (Clore et al., 2005).

Close to the contrast of emotion and thinking has been that between emotion and reason. "Reason" has at least two different meanings: that of involving the use of complex thought processes like logical inference, and that of using means-end-relationships to reach optimal problem solutions. The first meaning contrasts reason with the intuitive and impulsive processes; the second with the often harmful and disorganizing aspects of emotions, and their command of primitive responses. Both contrasts have been attenuated in modern theory. The first is weakened by recognition of the complex appraisals that underlie most emotions. They derive from standards of comparison, cultural values, thwarting or fulfillment of expectancies and concerns. All are involved in elicitation of social emotions such as shame and regret. The second contrast is weakened by recognition of the "rationality of emotions" (DeSousa, 1988): recognition of emotions as in principle reasonable and functionally appropriate responses to events as appraised. Emotions also appear as conditions for rational choice (Damasio, 1994, DeSousa, 1988; Frank, 1988; Solomon, 1993, 2004), because they respond to a wider array of relevant variables.

And nevertheless: both contrasts between emotion and rationality remain. The emotions aroused by simple stimuli may override further cognitions, notably those relevant to consequences that are more remote in time. Emotionally effective beliefs may disagree with simultaneously held more solidly founded beliefs. Spider phobics often recognize that spiders are harmless, and still fear them. Dysfunctional emotions were discussed previously. As DeSousa (1988) argued, emotions possess only "local rationality". But the contrast is perhaps not really between emotions and rationality, but between what does elicit emotions and what could elicit emotions when “rational” information would obtain emotional appeal.

Emotion experience

One major problem has hovered over the field of emotion study, and it still does: that of conscious feelings. What are they, and what role do they play with regard to emotional behavior and the conduct of life?

It was not too long ago that emotions were defined as particular states of consciousness that causally determined bodily and behavioral responses. That time has changed. In current literature one frequently comes across the view that feeling is a mere epiphenomenon of neural and bodily processes. Neural and bodily processes come first, and can proceed entirely or largely without the intervention of feelings. That view has solid support in the conviction that all conscious phenomena find their roots in neural processes, reflect neural processes, and depend on neural processes. Also, there is the fairly general conviction that physical causal sequences are closed. Neural processes may give rise to conscious experience, but it is hard to conceive that conscious experience might influence neural processes in turn.

Yet, this view contradicts everyday experience. It does so outside the domain of emotions. Although there is appreciable “blindsight”, the name given to perception without conscious awareness, the blindsighted person is severely handicapped (Weiskrantz, 1997). It also contradicts experience within the emotion domain. One refuses to enter some dark alleyway because it looks grizzly, breaks off a friendship with someone who had made one very angry, and go to great lengths to please someone who gave warmth and joy. One decides to go to the movies because that spells fun.

Much of such everyday experience may well be illusionary. One often acts for other reasons than the feelings one is aware of, or constructs. Psychoanalytic exploration found evidence that this is so; contemporary experiment confirmed it. So, everyday experience notwithstanding, feeling might still be useless. The general

theoretical argument for this conclusion was mentioned: how could feelings possibly influence neurons? One can state this as a problem, rather than as an argument. It has been called “the” hard problem of consciousness (Chalmers, 1996): how to conceive of the relationship between body and consciousness. It is the problem that comes clearest to the fore in emotions, where feelings, but also cognitions, appear to influence the body and get information back from the latter. It is the problem that Descartes was the first to truly recognize, indeed in his *Passions de l’âme*. It is still entirely unsolved, recourse to Spinoza (Damasio, 2003) notwithstanding.

There is good reason, other than everyday experience, not to be satisfied with considering feelings epiphenomenal and irrelevant for behavior. That view makes feeling into an evolutionary oddity. It came about –when? with the advent of humans? with the advent of primates? with the advent of vertebrates?– without any adaptive advantage. It is unlikely. Which means that research has to continue on the possible effects of conscious feelings, and on probing into how such an effect could occur if it did.

What created the doubts on a function of feelings has been twofold. First, there has been the force of James’ argument that feelings are the readouts from bodily emotional reactions that, therefore, must have been present before the feelings. Second, there is the massive evidence of affective reactions that can occur without the subject being aware of their object, of the emotionally-relevant attributes, or even of the reactions having taken place (Bargh, 1997; Berridge, 2004; Moors & De Houwer, 2006; Zajonc, 1980).

Yet, the range of emotional reactions shown to occur nonconsciously has, as yet, been limited. It included nonconsciously induced liking for neutral stimuli, enhanced preferences for liked substances or stimulus objects, nonconscious imitation of behaviors, delayed extinction of conditioned physiological arousal. To what extent

affective influences may unwittingly determine strivings, goal-directed behavior, and conduct of life remains to be demonstrated.

Examining the role of conscious feelings in emotions is rendered difficult because of the various ways in which feelings can occur. Conscious experience occurs in various modes: reportable or not reportable, diffuse and global or articulate and amenable to verbal description. The several modes have given rise to sharp disagreements about the nature of emotional feelings: irreducible qualia, sensory body sensations, central body state and position representations, action representations, perception of external events with emotional meanings (Frijda, 2005, 2007; Lambie & Marcel, 2003). It can be argued that all can occur, depending on circumstances and attentional attitude, thereby perhaps giving rise to needles disagreements

Concluding remarks

Will the perennial problems in the psychology of emotion remain? Perennial problems often cannot be resolved since they reflect different world views and one's limited capacity for conceptualization. The wave-particle dilemma in physics would seem to be something of the latter sort; the contrast between social constructivism and explanation by laws and mechanisms of the former. But perhaps the scope of the problems can be pushed back by insight into the relationships between proposed solutions for the various problems.

As I remarked, psychological explanations of emotional phenomena are being sought at different levels. Answers to several questions may seem incompatible when they are answers to questions being sought at different levels of explanation or at different levels of the phenomena.

That the study of emotion could advance, I think, when Dennett's level distinctions are better heeded, and his functional or psychological level receives more attention. In current analyses of emotion antecedents, little is being said about what constitutes a reinforcement, and why; Schroeder (2004) courageously presented a single effort. Only first endeavors are being made of constructing models of appraisal processes and of the inner structure of concerns that play such a pivotal role in explaining emotions. As far as I know, for instance, there do not exist detailed hypotheses at the functional level on how innate affective stimuli do evoke affect. How sugar evokes not only the sensation of sweetness but also the experience of pleasantness --I have no idea, even granted that somehow opiates may become active. Ultimately, intentional phenomena like experiences, desires and goals should be clarified in terms of subpersonal, functionally defined processes. But such clarifications are scarce (but see Metzinger, 2003). As a consequence, jumps are being made from the intentional to the hardware or neurophysiological level, and vice versa. Fear arousal is mediated by the amygdala; but how exactly do the amygdala do that? We grasp what we like, but how do we proceed?

All this is important for advances in emotion research because there is no guarantee that categories of analysis at one level project onto coherent categories at another level. There is no guarantee that emotions as defined experientially or behaviorally all involve one mechanism, or one coherent set of mechanisms. The mechanisms of fear of failure may have little in common with the mechanisms of fear of the unknown or of spiders, except that they all share the final common pathways of trying to escape or behavioral inhibition. That all stimuli that evoke emotions are in some way appraised does not imply the existence of one single coherent appraisal mechanism. And so on.

How explanations at different levels are related of course depends on the findings at different levels. It would be profitable when researchers in different areas and on different levels talked more to each other, and listened more to each other. It would be profitable if they knew better what happened at other areas and levels. Experimental investigators of emotions often know little of the social and cultural psychology of emotions, and vice versa. That painfully restricts the range of emotion elicitors considered in the explanatory hypotheses. Students of the neuropsychology of emotion often know little of the contemporary psychology of emotion. They sometimes write as if the paradigm of what causes emotions is an electric shock, and as if the paradigm of motivation is thirst or hunger, or something weird like "survival". To most psychological researchers the limbic area is merely somewhere in the brain, and the amygdala an amorphous blob of tissue. There is no real reason why all that should remain that way. To counter that of course is one of the main purposes of this handbook.

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