Giovanna Colombetti

Appraising Valence

'Valence' is used in many different ways in emotion theory. It generally refers to the 'positive' or 'negative' character of an emotion, as well as to the 'positive' or 'negative' character of some aspect of emotion. After reviewing these different uses, I point to the conceptual problems that come with them. In particular, I distinguish: problems that arise from conflating the valence of an emotion with the valence of its aspects, and problems that arise from the very idea that an emotion (and/or its aspects) can be divided into mutually exclusive opposites. The first group of problems does not question the classic dichotomous notion of valence, but the second does. In order to do justice to the richness of daily emotions, emotion science needs more complex conceptual tools.

I: Introduction

With the term 'valence' emotion theorists usually refer to the 'positive' and 'negative' character of an emotion and/or of its aspects (such as behaviour, affect, evaluation, faces, adaptive value, etc.). The English word 'valence' was introduced in psychology in the 1930s, but not immediately within emotion theory. Similarly, the expression 'positive and negative emotions' started to become scientifically regimented around those years. Since then, the two expressions have gradually come together, and they are now reciprocally supporting and mutually defining conceptual tools of contemporary emotion science.

In this paper I do two things. In the first part (sections II to V) I show that the term 'valence' has been used in more than a half-dozen different ways since its appearance in psychology and emotion theory, and I review and illustrate these uses in detail. In the second part (section VI) I highlight the problems that, in my view, go along with such uses. I distinguish problems that have to do with conflating different uses of the notion of valence, and problems that depend on the idea that emotions and/or their aspects can be dichotomized. I conclude the discussion with an assessment of the utility of the notion of valence in emotion theory (section VII).

Correspondence:
Giovanna Colombetti, Laboratorio di Scienze Cognitive, Università degli Studi di Trento, via Tartarotti, 7, 38068 Rovereto, Italy. *Email: colombetti@form.unitn.it*

The first part of the paper is independent of whether one agrees with the discussion in the second part; it is, I hope, useful in itself. The process that has led 'valence' to refer to the 'positive' and 'negative' character of emotion and/or its aspects is subtle. Often the terms 'valence,' 'positive' and 'negative' appear without prior definition, on the assumption that their meaning is clear and uncontroversial. Yet what is 'positive' and 'negative' depends on one's concerns. This lack of explicitness has accumulated over the years, leading to a bundle of cross-definitions and cross-characterizations. Different meanings of 'valence' often inadvertently crop up and influence one's theory; the less aware one is of such different meanings, the more likely one is to assume and conflate them when using the word – hence the present overview.

The second part is more argumentative and builds on recent philosophical discussions of the notion of valence (Charland, 2005a; Prinz, 2004; Solomon & Stone, 2002). As I see it, some of the problems raised by the current uses of this notion do not question the idea that emotions have a positive or negative character; they just call for more terminological awareness and explicitness. Other problems, however, depend on the very idea that emotions and their aspects can be dichotomized. These problems highlight the inappropriateness of the notion of valence, and raise the question of whether this notion can be enriched, or whether it should rather be rejected.

II: From Chemistry to Psychology

The etymology of 'valence' does not refer to any polarity. The term comes from the Latin noun *valentia*, which means 'power, competence' (from the verb *valeo*, 'I am strong' or 'I am well'). In Italian, for example, the word *valenza* has kept this meaning and is used to refer to the significance or value of a situation.[1]

The English word 'valence' (or 'valency'), as well as the equivalent in other languages (*valence, valenza, valentia*, etc.), is also used in chemistry. Atoms have 'valence electrons' in their high energy levels, and these electrons are shared in the formation of compounds. Simply put, atoms with one or two valence electrons are unstable and tend to stabilize by forming compounds, whereas atoms with eight valence electrons are very stable. Atomic valence is expressed by a positive integer (1 to 8), and is thus neither positive nor negative. What is 'positive' and 'negative' is the charge of atomic components, such as electrons (negative charges) and protons (positive charges). Also, some elements attract valence electrons and as a consequence their overall charge becomes negative; other elements give up some of their valence electrons and their overall charge becomes positive.

When the English term 'valence' first appeared in psychology, it was used mainly as a synonym of 'charge.' Tolman (1932) proposed 'valence' as a translation of the German word *Aufforderungscharakter* as it appears in the works of

---

[1] For example: *'Il Grido' di Edward Munch ha una forte valenza emotiva* = Edward Munch's 'The Scream' has a strong emotional valence. Or: *La valenza politica di un incontro* = The political valence of a meeting.

Kurt Lewin. In illustrating both Lewin's and his own ideas, Tolman claimed that thanks to their '"invitation-characters" or "valencies" (*Aufforderungs-charaktere*)' objects exert 'attracting or repulsive forces,' which are 'stresses and strains which finally resolve themselves by causing such and such directions and turnings of behavior' (Tolman, 1932, p. 179). Lewin similarly defined *Aufforderungscharaktere* as 'imperative environmental facts' that 'determine the direction of the behaviour' (Lewin, 1935, p. 77). *Aufforderungscharaktere* can be either positive or negative. The positive ones effect approach, whereas the negative ones produce withdrawal or retreats (*ibid.*, p. 81). Notice the comment of Lewin's translators on the decision to use 'valence':

> There is no good English equivalent for *Aufforderungscharakter* as the author uses it. 'Positive *Aufforderungscharaktere*' and 'negative *Aufforderungscharaktere*' might be accurately rendered by 'attractive characters' and 'repulsive characters,' were it not desirable, for various reasons, to have a neutral term. Perhaps the most nearly accurate translation for the expression would be 'compulsive character,' but that is cumbrous and a shade too strong. In consultation with the author it has been decided to do a very little violence to an old use of the word 'valence' (see the New English Dictionary). It should be noted that, in contrast to chemical valence, which is only positive, psychological valence or a psychological valence may be either positive (attracting) or negative (repelling), and that an object or activity loses or acquires valence … in accordance with the needs of the organism. [Translators' note]. (in Lewin, 1935, p. 77)

Auffordern in German means to invite one to do something; *Aufforderungs-charakter* thus refers to the property of inviting one to an action. An accurate translation would be 'affordance-character', where the term 'affordance' is borrowed from ecological psychology (Gibson, 1979) and refers to properties of the environment that afford or invite a certain behaviour toward it (for example, a chair affords a behaviour of sitting onto it).

What is interesting, ultimately, is that 'valence' entered Anglophone psychology via a questionable translation, and initially referred to affordance-characters rather than emotions. This use of 'valence', however, was not unambiguous and it contained the seeds of subsequent uses of the term, including its relation to emotion. First, in Lewin an affordance-character is not only a charge that induces an agent to *physically* approach or withdraw an object:

> We may at this point remark a circumstance of general importance: direction in the psychobiological field is not necessarily to be identified with physical direction, but must be defined primarily in psychological terms. … When the child fetches a tool or applies to the experimenter for help, the action does not mean, even when it involves a physical movement in a direction opposite to the goal, a turning away from the goal but an approach to it. (1935, p. 84)

In this passage Lewin understands approach as involving an action toward a *goal-state*, irrespective of the movement's direction. This conception opens up the question of what approach and withdrawal are. As we shall see, behaviourists and cognitivists will answer differently, and thus use 'valence' in different ways.

Second, in Lewin the sign of an affordance-character often depends on the *experience* that it induces. In many of his examples, positive (negative, respectively) affordance-characters are accompanied by pleasant (unpleasant) feelings. A child who has to choose between going to a picnic or playing with his friends stands between two positive valences; a child who wants to climb a tree but is afraid of it faces something that has simultaneously a positive and a negative valence; etc. (cf. Lewin, 1935, p. 89). Here the character of experience tacitly determines the sign of the affordance-characters. As we shall see, this happens frequently in emotion theory. 'Valence' is now often used to refer to how good and bad an emotion feels; yet it often refers, at the same time, to phenomena (behaviours, goals, evaluations, etc.) tacitly assumed to feel intrinsically good or bad.

III: Object Valence, Behaviour Valence, and Emotion Valence

Charland (2005a; 2005b, this volume) has introduced a useful distinction between *emotion valence* and *affect valence*. 'Emotion valence' refers to the positive and negative character of an emotion *tout court* (the positive or negative character of fear, anger, joy, etc.), whereas 'affect valence' refers to the positive and negative character of emotion experience (how good or bad an emotion feels). In this and the following section I will adopt Charland's distinction, and I will enrich it by individuating more uses of 'valence'.

Tolman's and Lewin's notion of valence refers to the positive or negative charge of objects in the environment — let us then call it *object valence*. As we saw, Tolman and Lewin did not use 'valence' to refer to emotion. Yet current emotion theories often posit a link between object valence and emotion valence. Positive or negative emotions are said to be elicited, for example, by positive or negative environmental contingencies, stimuli, pictures, words (Cacioppo & Berntson, 1994), events (Bradley & Lang, 2000), film clips (Davidson, 1998), images, pictures and percepts (Lang *et al.*, 2000). The International Affective Picture System (IAPS, cf. Lang *et al.*, 1995) consists in a set of positive, negative and neutral pictures, aimed at eliciting emotions with the corresponding valence sign (positive pictures include happy babies, appetising food and erotica; negative ones include poisonous snakes, aimed guns and violent deaths; neutral ones involve people doing routine tasks, rental places and common household objects).

Frijda (1986) also uses 'valence' as object valence: '[e]vents, objects, and situations may possess positive and negative valence; that is, they may possess intrinsic attractiveness or aversiveness' (p. 207). Valence is for Frijda one of ten other components of what he calls 'situational meaning structure' — a set of environmental properties that define the meaning of a situation which, in turn, determines the occurrence of emotions. Other components of situational meaning structure are difficulty, urgency, seriousness, clarity, etc. (pp. 204–9); together with valence, they determine behaviour and experience. Note that on this view object valence does not directly determine emotion valence (indeed, in 1986 Frijda did not even mention 'positive and negative emotions').

Another early use of the term 'valence' is in Schneirla (1959, table on p. 30), where it refers to the direction of behaviour — let us call this *behaviour valence*. 'Positive valence' refers to approach, retaining, tolerance and acquisition; 'negative valence' refers to withdrawal, escape, refusal and aggression. Like object valence, behaviour valence was not initially used within emotion theory. At present, however, many emotion theorists relate behaviour valence and emotion valence. For example, Davidson uses 'valence' primarily to refer to approach and withdrawal, and is interested in how different brain hemispheres contribute to it. He has presented evidence that approach depends on increased activation in left prefrontal cortical regions, whereas withdrawal depends on increased activation in right prefrontal cortical ones (e.g. Davidson, 1993). In addition (and unlike Schneirla), Davidson also uses behaviour valence to determine emotion valence; he defines a positive emotion as involving approach, and a negative emotion as involving withdrawal.

It is interesting that authors who initially used 'valence' did not use 'positive and negative emotions' and also vice-versa (table 1). Arnold & Gasson (1954, p. 206) and Arnold (1960, p. 195), for example, defined positive (negative) emotions in relation to behaviours toward (against) beneficial (harmful) objects, but they never used the term 'valence.'

Authors	Use 'valence' as object or behaviour valence	Use 'positive and negative emotions'
Tolman (1932)	Yes, as object valence: positive (negative) valence refers to attractive (aversive) stimuli.	No
Lewin (1935)	"	"
Arnold & Gasson (1954)	No	Yes. Positive (negative) emotions are elicited by suitable (harmful) objects
Schneirla (1959)	Yes, as behaviour valence: positive (negative) valence refers to approach (withdrawal) behaviour	No
Arnold (1960)	No	Yes. Positive (negative) emotions involve behaviour toward (away from) objects
Frijda (1986)	Yes, as object valence: positive (negative) valence is attractiveness (aversiveness) in objects	No
Davidson (1993)	Yes, as behaviour valence: positive (negative) valence refers to approach (withdrawal) behaviour	Yes. Positive (negative) emotions involve approach (withdrawal)
Cacioppo & Bernston (1994)	Yes, as object valence: The positive (negative) valence of pictures and other stimuli	Yes
Lang *et al* (2000)	Yes, as object valence: The positive (negative) valence of pictures, images and percepts	Yes

Table 1. Early uses of 'valence' as object valence and behaviour valence, and some more recent ones. The table also indicates early definitions of 'positive and negative emotions' in relation to objects and behaviour.

IV: Affect valence

At present, valence is often used as *affect valence* (Charland, 2005a; 2005b, this volume) — it refers to how good or bad an emotion experience, or affect, feels.

Psychologists have discussed the hedonic tone of emotions — their pleasant or unpleasant feel — since Wundt's (1907) and Titchener's (1908) debate on feelings and bodily sensations (reflections on hedonic tone appeared much earlier, of course). Since then, so-called 'dimensional approaches' (e.g. Block, 1957; Russell & Mehrabian, 1977; Russell, 1980) have always posited pleasantness-unpleasantness as a fundamental dimension of emotion experience.[2] This dimension has gradually become 'the valence dimension'.[3] In this approach, hedonic tone and valence are synonyms. A different approach posits positive affect (PA) and negative affect (NA) as two separate unipolar dimensions (Bradburn, 1969). Here positive and negative affect do not coincide with pleasantness and unpleasantness, and there is no hedonic/valence dimension. For example, for Watson & Tellegen (1985) and Watson *et al*. (1988), pleasantness depends on high PA *and* low NA, and unpleasantness depends on low PA *and* high NA.[4]

In the first approach, valence is the positive-negative dimension of experience and is distinct from the dimension of arousal (or activation), and sometimes from a third or even fourth dimension. In other cases, 'valence' refers to the positive-negative character of *all* dimensions of emotion experience that one individuates. For example, according to Davitz (1969) emotion experience has four dimensions — hedonic tone, direction of behaviour, activation and competence (how good or bad one feels one is at something) — and they are all valenced. Valence cannot be decoupled from these dimensions; it is *intrinsic* in all of them.

Theories of affect valence differ in how they explain *why* an affective state feels good or bad. For Damasio (2003), for example, the valence of feelings depends on how easy and free-flowing organismic processes are. When organismic processes are optimal and non-obstructed, the accompanying feelings are positive; vice-versa, when the organism is impeded in its activity and maintenance of well-being and balance, the accompanying feelings are negative. According to Davidson (e.g. 1984), the behaviour of approach (withdrawal) is intrinsically pleasant (unpleasant); approach and approach-related positive affect depend on the left hemisphere (also responsible for fine motor control; cf. Davidson, 1984), whereas withdrawal and withdrawal-related negative affect

---

[2] These approaches developed after the so-called *semantic differential* (Osgood, 1952), originally developed to capture 'the dimensions of meaning' — the dimensions underlying 'something basic to the structuring of human judgments' (Osgood & Suci, 1955, p. 337). Osgood and colleagues individuated three such dimensions: 1) *activity* (as in sharp-dull, active-passive, fast-slow); 2) *potency* (as in strong-weak, large-small, heavy-light, hard-soft), and 3) *evaluation* (as in beautiful-ugly, nice-awful, clean-dirty, pleasant-unpleasant, delicate-rugged). The idea that meaning and experience have dimensions comes in turn from attempts to understand synesthesia (in particular whether synesthesia involves the 'parallel alignment' of two or more experiences).

[3] For example, Russell (1980) does not mention valence, but Russell & Carroll (1999) and Russell (2003) do.

[4] See Russell & Carroll (1999) for an overview of the debate between bipolar and unipolar theories, and for a defence of the former.

depend on the right hemisphere (responsible for gross withdrawal reactions). For Lambie & Marcel (2002) emotion experience depends on first-order irreflexive phenomenal experience, as well as on second-order reflexive awareness. On their view, hedonic tone can change according to attentional mode (for example, it might disappear if one attends to one's bodily sensations and feelings in a sufficiently analytic and detached manner). Drawing on this account, Charland (2005a) has proposed an explicitly 'non-intrinsic view' of affect valence, according to which affect valence is *always* constructed through the interplay of first- and second-order processes; in Charland's words, affect valence is *indeterminate*.

Although affect valence is often discussed *per se* within phenomenological analyses of emotion experience, it also often contributes more or less explicitly to other uses of valence. When emotions are called 'positive and negative' without explanation, the most plausible understanding of the expression is usually in terms of 'good and bad feelings.' Similarly, object valence, behaviour valence, and other uses of 'valence' (see next section) are often parasitic on affect valence. Table 2 lists (some of) the authors who currently use 'valence' to refer to emotion experience (pleasantness-unpleasantness, and/or positive and negative affect and/or feelings). It also indicates those who use affect valence to characterize emotion valence (*caveat*: it is not always easy to attribute these uses, so the list is not comprehensive and might not reflect the author's intentions).

Authors who use 'valence' as affect valence	Use affect valence to define emotion valence (positive emotions feel good, negative emotions feel bad)
Davitz (1969)	Yes
Tucker (1981)	No
Lang (1984; 1985)	No
Davidson (1984; 2000)	Yes
Panksepp (1998)	In part (see section V)
Russell & Carroll (1999)	No
Isen (2000)	Yes
Lambie & Marcel (2002)	No
Rozin (2003)	No
Damasio (2003)	Yes
Varela & Depraz (2005, this volume)	No

Table 2. Some authors who use valence as affect valence; and, among them, those who use affect valence to define emotion valence

V: More Valenced Phenomena, and their Relation to Emotion Valence

Other aspects of emotion are called 'valenced.' These uses further cross-define and complicate the notion of valence and its relation to emotion.

The valence of facial expressions

The 'valence' of a facial expression usually refers to the positive and negative character of the experience that the face (allegedly) expresses. What is called 'positive' and 'negative' in a face however varies according to how one views the relation between facial display and experience. It is useful to distinguish three such views:[5]

(1) The *purely categorical* approach, according to which there is a number of basic emotions expressed by typical faces. What is 'valenced,' in this view, is the whole face (Tomkins, 1962/1963, 1970; Ekman, 1999).

(2) The *componential* approach, according to which facial expressions have meaningful components, and one component can appear in the expression of different emotions. In general, eyebrow frown (produced by contracting the corrugator supercilii) is associated with unpleasant experiences, and raised lip corners (produced by contracting the zygomatic major) is associated with pleasant ones. Reinman *et al*. (2000) say that zygomatic muscle activity is a measure of positive emotion, whereas corrugator muscle activity is a measure of negative emotion. What is 'valenced' here are individual components, and they 'valence' the emotion expressed by the whole face.

(3) The *dimensional* approach, according to which facial expressions of emotion are organized along a few dimensions. Schlosberg (1941; 1952; 1954) distinguished facial expressions initially according to two dimensions (pleasantness-unpleasantness and attention-rejection) and then three (adding the level of activation). As in dimensional accounts of emotion experience, 'valence' here corresponds to the pleasantness-unpleasantness dimension.

For Davidson (e.g. 1984) facial expressions are not only an index of affect valence, but also of emotion and behaviour valence. In his view, positive facial expressions depend on neural structures in the left hemisphere that are implicated in positive emotions — namely, approach-involving emotions and associated positive affects; and negative facial expressions depend on neural structures in the right hemisphere that are implicated in negative emotions — namely, withdrawal-involving emotions and associated negative affects.

Authors who mention positive and negative facial expressions	Relation of facial valence to affect and/or emotion valence
Tomkins (1962/1963)	Faces express negative or positive affect
Ekman (1972; 1999)	Positive (negative) facial expressions express positive (negative) affects
Davidson (1984)	Positive (negative) facial expressions involve the same neural structures as positive (negative) emotions
Watson & Tellegen (1985)	Positive (negative) facial expressions express positive (negative) affects
Reinman *et al*. (2000)	Zygomatic (corrugator) activity indicates positive (negative) emotion

Table 3. Uses of 'facial valence' and their relation to emotion and/or affect valence

---

[5] Here I follow, in part, Smith & Scott (1997).

Evaluation valence

Emotion valence sometimes depends on *evaluation valence* – the positive or negative character of eliciting evaluations. For Ben-Ze'ev (2000) positive and negative emotions are elicited by positive and negative evaluations; a positive (negative) evaluation is an evaluation of something as good (bad). Schadenfreude is thus positive because it is elicited by a positive evaluation — that is, an evaluation of someone else's misfortunes as good. Similarly, compassion and sympathy are negative, because they are based on the evaluation of one's condition as bad. Ortony *et al.* (1988, p. 13) similarly define emotions as 'valenced reactions to events, agent, or objects, with their particular nature being determined by the way in which the eliciting situation is construed.' In their theory all emotions are elicited by an evaluation. Exactly which emotion an agent will have depends specifically on whether the evaluation is about events, actions or objects; whether these are evaluated as good or bad; and whether they are evaluated with respect to their consequences for the self or for other people. For example, A's pity for B is elicited by A's evaluation of an event as thwarting B's goals (negative valence); A's shame is elicited by A's evaluation of A's action as blameworthy (negative valence); and A's love for X is elicited by A's evaluation of X as suitable (positive valence). Emotion valence here depends on evaluation valence, and what makes an evaluation 'positive' or 'negative' depends on whether an event is evaluated as 'good' or 'bad.'

According to Lazarus (1991), a positive (negative) emotion is an emotion elicited by the evaluation that the person-environment relationship caused by the emotion is beneficial (harmful). This definition makes pity, compassion and sympathy 'positive.' Finally, Lambie & Marcel (2002, p. 243) mention 'positive and negative evaluations' as a factor that influences emotion experience. They do not specify what makes an evaluation positive or negative in the first place, but it is clear that, on their view, evaluations are 'valenced contents of emotion experience,' together with other valenced phenomena.

Authors who use valence as evaluation valence	Relation of evaluation valence to emotion and/or affect valence
Ortony *et al.* (1988)	Positive (negative) emotions are elicited by evaluations of events, objects and actions as good (bad)
Lazarus (1991)	Positive (negative) emotions are elicited by the evaluation of the emotion as socially beneficial (harmful)
Ben Ze'ev (2000)	Positive (negative) emotions are elicited by positive (negative) evaluations
Lambie & Marcel (2002)	Evaluation valence is part of the content of emotion experience

Table 4. Uses of evaluation valence and their relation to emotion and/or affect valence

Teleological uses of valence

In artificial intelligence (AI) positive and negative emotions are often defined in relation to *goals*. For Dyer (1987) positive emotions involve the attainment of a

goal, and negative emotions involve the thwarting of a goal. Specific emotions differ according to how goals are attained and thwarted; whereas sadness can be seen as depending on one's goals being thwarted in general, anger depends on the presence of someone or something thwarting one's goals. According to this approach, most emotions can be called positive and negative only *a posteriori* – after a certain goal has been attained or thwarted. I call this the *teleological* use of valence, because it defines the positive or negative character of one's emotions according to the consequences of one's actions with respect to one's goals, needs or desires.

Izard (1991) chooses to define positive (negative) emotions according to whether their consequences are desirable (undesirable). Other views of valence do not explicitly mention goals and desires, but can nevertheless be seen as teleological because they define positive and negative emotions with respect to future states considered desirable or undesirable. For example, as we saw, Lazarus (1991) claims that positive (negative) emotions are elicited by the appraisal of a situation as having beneficial (harmful) social consequences. Bickhard (2000) characterizes positive emotions as diminishing uncertainty, and negative emotions as augmenting it (these examples also show that the teleological use of valence can overlap with evaluation valence). Another teleological use of 'valence' is in Rozin (2003): '[a] positive state is one that we seek or try to maintain or enhance, and a negative state is one that we seek to reduce, eliminate or avoid' (p. 840). Likewise, for Prinz (2004) '[p]ositive emotions are ones we want to sustain, and negative emotions are ones that we want to get rid of' (p. 174); valence in his view corresponds to inner positive and negative reinforcers — brain systems that make us persist in rewarding behaviours, and cease non-rewarding or punishing ones.

Authors who use valence teleologically	Relation of teleologically-used valence to emotion valence
Dyer (1987)	Positive (negative) emotions involve the realization (thwarting) of goals
Izard (1991)	Positive (negative) emotions are likely to have desirable (undesirable) consequences
Lazarus (1991)	Positive (negative) emotions are beneficial (harmful) to social relationships
Bickhard (2000)	Positive (negative) emotions diminish (augment) uncertainty
Rozin (2003)	A positive (negative) state is one that we seek to enhance (get rid of)
Prinz (2004)	A positive (negative) emotion is one that we want to sustain (get rid of)

Table 5. Teleological uses of valence and their relation to emotion valence

Valence as adaptive value-tagging

According to Panksepp (e.g. 1998; 2000; 2005, this volume), mammals share seven basic subcortical and endocrine emotional systems that encode biological values. These emotional systems are 'valenced' in the sense that they 'value-tag' objects and situations in the environment and thus regulate adaptive behaviours.

For Panksepp every basic emotional system is valenced, in the sense that, in order to guide behaviour, it attributes values to the world. Some emotional systems feel always bad (FEAR and PANIC), others feel always good (PLAY and CARE), and others feel good or bad according to the situation (SEEKING, RAGE and LUST).

Valence and norms

Finally, sometimes valence is explicitly and primarily defined in relation to norms and values. Picard (1997) thinks that an affective computer should have a sense (either hard-wired or learned) for what is morally good and bad, and this is how she defines valence (cf. p. 223). Also, scientists are becoming increasingly interested in Buddhist conceptions of mind and emotion (cf. Davidson & Harrington, 2002; Goleman, 1997; 2003), and Buddhism explicitly moralizes emotion. 'Positive and negative emotions' corresponds to a distinction between 'virtuous' and 'non-virtuous' mental factors (see Dreyfus, 2002, for an introduction to the concepts of mind and emotion in the Abidharma tradition). Negative mental factors (anger, attachment) disturb the mind and should be avoided; emotions such as loving-kindness and wishing well for other beings should be cultivated. This distinction is primarily ethical, but is at the same time intertwined with the consideration that virtuous emotions improve one's overall well-being, whereas non-virtuous ones disrupt it. Positive, virtuous emotions are wholesome, and negative, non-virtuous ones are unwholesome.

In line with this view, Davidson has investigated the health consequences of what he calls 'positive' and 'negative' *affective styles*. A positive affective style involves mainly 'positive emotions' — which for Davidson include positive affect, social engagement and extroversion. A negative affective style involves a predominance of 'negative emotions' — anxiety, depression, social disengagement and introversion. Left-prefrontal activated individuals tend to have a positive affective style, whereas right-prefrontal activated individuals tend to have a negative affective style. Davidson *et al.* (1999) have shown that, in addition, 'positive' left-activated individuals have more natural killer cells in their immune system and are less likely to become sick, whereas prototypical 'negative' right-prefrontal activated individuals have less natural killer cells and are more likely to become sick.

VI: Problems — Conflations and Dichotomies

The overview of different uses of 'valence' I have just offered is not exhaustive (for more uses see Charland, 2005a; Prinz, 2004: 167-173; Solomon & Stone, 2002). Prinz and Solomon & Stone also mention various problems raised by different uses of the expression 'positive and negative emotions.'

In my view, the problems raised by the uses of valence reviewed above can be divided into two groups. First, there are problems of *conflation* deriving from the tendency to switch back and forth between the valence sign of an emotion *tout court*, and the valence sign of different aspects of emotion. Such conflations, as we will see, induce excessive simplifications and overlook many familiar cases

of emotion; because an emotion feels good, it does not follow that it is also itself positive, or that it involves positive behaviour, positive facial expressions, positive evaluations, etc. There are then deeper and more challenging problems that derive from the idea that emotion and its aspects can be *dichotomized*. Valence is typically characterized in terms of mutually exclusive poles, which logically rules out the possibility of mixtures. This characterization also oversimplifies and overlooks daily lived emotions, but in a more fundamental and worrying way. Whereas the first group of problems highlights a lack of clarity and agreement when using 'valence' that could be solved with more explicitness, the second group of problems calls into question the utility of the current notion of valence as a descriptive and explanatory tool of emotion theory.

Conflations

Conflations arise when a positive (negative) emotion is taken to necessarily have positive (negative) aspects. According to Davitz (1969), for example, positive emotions involve positive direction of behaviour ('moving toward'), positive hedonic tone ('comfort'), positive activation ('activation') and positive competence ('enhancement'). Negative-1 emotions involve negative-1 behaviour ('away'), negative-1 hedonic tone ('discomfort'), negative-1 activation ('hypoactivation') and negative-1 competence ('dissatisfaction'). Negative-2 emotions involve negative-2 behaviour ('moving against'), negative-2 hedonic tone ('tension'), negative-2 activation ('hyperactivation') and negative-2 competence ('inadequacy'). Davitz presents this taxonomy as if it exhausted all emotions. Yet one can find many examples of emotions that are not all positive, or not all negative-1 or all negative-2. Before an examination for which you are not very prepared, your state could be characterized by 'toward,' 'discomfort' and 'inadequacy'; if I am determined to leave a job that I do not like, then my emotion might be best characterized as involving 'activation,' 'enhancement' and 'away from'; and so on.

   Davidson also employs the tags 'positive' and 'negative' for several aspects of emotion *and* for emotions themselves (e.g. Davidson, 1984, 1998, 2000; Davidson *et al.*, 1990). He uses 'valence' primarily as behaviour valence, and maintains that approach depends on left prefrontal cortical regions whereas withdrawal depends on right ones. From here, however, Davidson often leaps to the claim that positive emotions *tout court* depend on the left hemisphere, and that negative emotions depend on the right one. In other words, he tends to infer the lateralization of emotion valence from the one of behaviour valence. This tendency induces him, in turn, to lateralize affect valence: left-hemisphere positive emotions feel good, whereas right-hemisphere negative emotions feel bad. He also mentions positive and negative facial expressions (e.g. Davidson, 1984), and eventually groups all positive (negative) aspects of emotion into positive (negative) personality traits dependent on left (right) hemispheric activation (the 'affective styles' mentioned above).

Davidson's view fits *prima facie* some of the classic emotions discussed in emotion theory. Fear, for example, seems to have all the characteristics of right hemispheric activation: it involves withdrawal, it feels bad, it is expressed by a negative facial expression, and it is a paradigmatic negative emotion. Similarly for contempt and sadness. Joy, on the other hand, seems to have all the characteristics of left hemispheric activation: it involves approach, it feels good, it is expressed by a positive facial expression, and it is a paradigmatic positive emotion. Similarly for pride and enthusiasm. However, there are cases that, on Davidson's own admission, the model does *not* fit. A popular counterexample is anger, which most theorists characterize as involving approach and unpleasantness. Davidson (e.g. 1994) admits that his model does not fit contentment, and post-attainment pleasant feelings in general, either. The upshot is that positive (negative) affect is only contingently related to positive (negative) behaviour, and to the general positive (negative) character of an emotion. Davidson's model does not fit all emotions conventionally discussed in emotion theory. Accordingly, one's affective style need not include either all positive or all negative traits.

The take-away message so far is that an emotion and specific behaviours, feelings, etc. need not together because they all have the same 'valence sign.' The lesson then is that emotion theorists should keep track of, and make explicit, their reasons for calling an emotion and/or its aspects 'positive' or 'negative.'

But what about the assumption that it is appropriate to dichotomize emotions and its aspects? This issue poses a more serious challenge to the current uses of the notion of valence. The major problem with Davidson's model, as I see it, is that it is not obvious that emotions such as relief, schadenfreude, jealousy, envy, contentment, etc. involve either approach or withdrawal, and always feel either good or bad. Davitz' distinction of the 'negative' part of valence into negative-1 and negative-2 does not make much progress, because it still assumes that an emotion is either comforting, discomforting *or* tense; that it leads one toward, away *or* against something; etc. In short, Davitz' tripartition still leaves no room for mixtures. I turn now to these challenging cases.

Dichotomies

The uses of valence reviewed above assume that different aspects of emotion can be dichotomized, and that the two terms of the dichotomies are mutually exclusive. 'Less positive valence' implies 'more negative valence,' which leaves no room for mixtures (typically human, but not necessarily only).

The notion of object valence implies that objects are intrinsically attractive or aversive, suitable or harmful. But attractiveness and aversiveness, and suitability and harmfulness are relational properties. They depend both on the agent's structure and concerns, as well as on the environment; the same object can be more or less appealing to the same agent depending on the context. Development and evolution make some objects more reliably attractive (aversive) than others. In short, object valence is never absolute; many environmental settings are new and

unusual, and agents have different developmental histories that relate them in different ways to objects and situation (this can pose a problem for experimental settings that assume the absolute positive and negative character of stimuli). The more complex the agent, the more complex and layered its developmental history and hence the significance of its objects.

Consider next the approach-withdrawal distinction, and compare approach in love and approach in anger. The former can be understood as a movement 'toward' the source of love, and the latter is better described as a movement 'against' the object of anger (see also Davitz, 1969). The latter is a reaction to aversive stimulation, and the two senses of approach are very different. Consider also the following example. I am angry at a certain person P (a colleague of mine, say) because she has insulted me. Because I cannot punch her, I start gossiping about her at work, until she is eventually fired. The 'approach' induced by my anger consists in the exploitation of causal chains in order to have an effect on P, and these causal chains involve withdrawal from P. Or consider the case in which I seek someone's help out of fear. It does not seem possible to account for these cases with a simple bipolar dimension of behaviour whose extremes are approach and withdrawal. Approach and withdrawal are such not simply because of the direction of movement they involve (toward and away from, respectively). As Lewin (1935) already noted, they are motivational categories tangled up with shorter- and longer-term goals, intentions and desires. To characterize them as 'opposites' overlooks the fact that they often coexist, and strips them down to 'directions of behaviour' that, by themselves, cannot account for most of our motivated behaviours.

As for affect valence, philosophers have often mentioned the possibility of mixed feelings. Plato in the *Philebus* says that pleasures are rarely pure; most of the time they are mixed, that is, they contain pain (in more or less measure). While watching a comedy we feel malevolence – we laugh at the characters' misfortunes, and although we are amused, this enjoyment contains an understanding of the characters' suffering. We enjoy watching tragedies, but at the same time we are overwhelmed with sorrow. Bodily feelings can themselves be admixtures of pain and pleasure, as in the relief of scratching an itch. Prinz (2004, p. 165) notices that nostalgia feels bad because one is missing something, but at the same time involves a memory of how good it was to have that something. Or consider the mixed feeling triggered by the news that your best friend has just been offered the job you really wanted.

Psychologists usually do not discuss these cases and build their models out of alleged 'pure' cases. Some of them explain away the ambivalent nature of mixed feelings by reducing them to duck-rabbit-like attentional switches (e.g. Arnold, 1960). On this view, it is not the case that nostalgia feels bad and good at the same time. Simply, when in nostalgia you pay attention to the absence of the missed object, you feel bad; when you pay attention to how good it was to have that something, you feel good. The two affects cannot be experienced at the same time. A different view would allow true phenomenological mixtures, as in a sweet-and-sour flavour. When I taste a sweet-and-sour dish, there is a sense in

which I understand why the dish is called that way. However, I do not really seem to be able to pay attention to the sourness in isolation from the sweetness, and vice versa. Perhaps mixed feelings are sweet-and-sour-like, and this is (among others) what early introspectionist studies on emotion experience were trying to assess (cf. Beebe-Centre, 1932, for an overview).

If feelings are sweet-and-sour-like – that is, irreducible to duck-rabbit-like experiences — bipolar unidimensional models of affect valence cannot account for them, because they leave no room for mixtures. A more appropriate model here could be Watson & Tellegen's (1985), according to which positive affect and negative affect are two independent dimensions. Pleasantness is characterized by low negative affect and high positive affect, and unpleasantness is characterized by high negative affect and low positive affect. In this model, mixed feelings could be characterized as containing, at the same time, high positive and high negative affect (as perhaps in *catharsis*), or low positive and low negative affect (as in *mild nostalgia*).

There are further complications. As Aristotle points out in the *Nicomachean Ethics*, there are as many pleasures as there are pleasant activities (see also Frijda, 1986; Kenny, 1963; Lambie & Marcel, 2000; Prinz, 2004; Solomon & Stone, 2002). The pleasure one takes in, say, one's friends' company feels different from the pleasure one has in eating one's favourite food; and different friends, as well as different foods, also induce different pleasures. Kenny (1963) argues that pleasure is not a separate feeling that is added or subtracted from activities, and that makes them pleasant or unpleasant accordingly. A pleasant activity is not an activity *plus* a feeling of pleasure. Rather, actions *are* pleasant or unpleasant; their peculiar pleasant feel depends on their object and, more generally, on the kind of activity they are. Similar considerations lead Lambie & Marcel (2002) to propose a notion of *multidimensional hedonic tone*. In their view, not only does every activity have its own hedonic tone; an activity might include *several* hedonic experiences. This happens because hedonicity, in their view, depends – at least in part – on how second-order attention is directed towards first-order pleasures and pains. For example, it depends on whether one's attention is immersed in the object of emotion or in one's experience (of bodily states, for example); on whether one's attention is more or less focused on the details of the experience; on whether one can change one's situation, etc.[6]

Finally, Charland's (2005a) argument for the indeterminacy of affect valence is particularly destabilizing. As we saw, he uses Lambie & Marcel's view to argue that affect valence is not an intrinsic property of emotion experience. Rather, valence is constructed through the interplay of first-order (irreflexive) phenomenology and attentional mechanisms directed to it. In this view, there is nothing fixed corresponding to affect valence, nothing objective 'already there'

[6] Many mixed feelings are likely to depend on some kind of interaction between more basic and irreflexive experiences, and higher-level reflexive ones (see Gennaro, 2000, for such an account of *catharsis*), but we should not exclude that feelings can be mixed also at the irreflexive level — perhaps as in mixed bodily feelings, such as the above-mentioned relief of scratching an itch (see Plato's *Philebus* for more examples).

that can be read out by second order attention. In other words, affect valence is an evaluative feature of emotion experience dependent on (or even arising from) second-order descriptions.[7] Charland's argument is destabilizing because it undermines attempts to justify the dichotomous positive and negative character of experience on the basis of how they 'simply' feel. How many poles or dimensions feelings have is likely to depend on the tools we (and emotion scientists) employ to investigate and report experiences.

Let us move on to 'evaluation valence.' We saw that, in the first place, there is no agreement on what makes an evaluation positive or negative, nor how evaluation valence relates to emotion valence. Second, it seems too simple to reduce appraisals in an emotion to a single evaluative dimension. As Solomon & Stone (2002) argue, '[v]irtually every emotion … involves a multiplicity of appraisals' (p. 427), or what they call a 'multidimensional appraisal': appraisal of the situation, of oneself, moral appraisals, etc.; some of these appraisals may detect positive aspects of a situation, and others may detect negative aspects. In addition, once again: we do not seem to evaluate something as, so to say, 'good' in amount xg and therefore 'bad' in amount k-xg.' To think that this is possible is to assume that we evaluate things as 'definitely good (bad)' — not 'perfectly good (bad)' perhaps, but without anything bad (good) in it.

Whether a facial expression (or a component of it) can be appropriately labelled 'positive' or 'negative' is complicated by difficulties with interpreting faces in relation to emotion and experience, and by problems with the notion of expression itself. This topic would require a paper on its own. For present purposes it is sufficient to note that tagging a facial expression as either 'positive' or 'negative' usually relies on the following assumptions: (1) there is an underlying experience that is either positive or negative; (2) the face expresses this experience, and it is possible to unequivocally read the experience from the face; (3) the face is interpreted as the expression of an emotion by an observer. Every assumption is problematic. First, as many theorists have pointed out, there is no one-to-one relationship between experience and facial expression — between 'feeling anger' and 'expression of anger,' 'feeling fear' and 'expression of fear,' etc. (cf. Russell & Fernández-Dols, 1997). This suggests that what looks like a positive (negative) expression may not necessarily reflect a pleasant (unpleasant) feeling. Second, seeing an expression as the manifestation of an 'inner' emotional feeling is an interpretative act that can go wrong because of context effects; indeed, there is evidence that context plays a role in the tagging of facial expressions (Russell & Fehr, 1987; Fernández-Dols & Carroll, 1997). Third, facial movements depend on several factors and not all of them 'express emotions.' Fourth, it is possible to argue that, when it comes to emotion experience, others' interpretations of our expressive attempts shape our own experience (see Campbell, 1997, for an externalist view of feeling). Finally, there is always the problem that it is not evident that feelings are always either pleasant or unpleasant. Interestingly, Ekman initially thought that people typically experience

---

[7] Yet: 'perhaps not all aspects of affect valence are equally permeable to attention, some may be relatively fixed and modular' (Charland, 2005a, p. 249).

blends of emotion, and that these show up on the face (Ekman, 1982). Ekman (1972) observed that only posed expressions can be accurately defined as positive or negative; spontaneous expressions do not provide precise information in this respect. More recently, Smith & Scott (1997) have noticed that

> there is considerable evidence suggesting that it is rare for most individuals to experience strong feelings of a single isolated emotion. Instead, across a variety of emotionally evocative contexts, it is common for individuals to report the subjective experience of blends of up to four (or more) emotions. … Although there have been attempts to describe the facial expressions characteristic of a limited number of emotional blends, … the principles by which such blended expressions are produced have not yet been articulated. (p.235)

This passage shows nicely how the assumption that an emotion experience can be easily dichotomized influences scientific methodology. Theorists divide faces into positive and negative, and design experiments based on this idea, excluding a priori more complex possibilities.

When valence is used teleologically, the positive and negative character of an emotion is defined in relation to the consequences of one's actions with respect to one's goals, needs or desires. As we saw, for some theorists positive (negative) emotions are *caused* by the attainment (thwarting) of goals, or by certainty (uncertainty) about the future. This approach is limited, as clearly not all emotions depend on attainment or thwarting of goals and desires; often we simply enjoy, or dislike, certain activities, and are anxious, depressed or jolly irrespective of our aims. Emotions such as contentment do not seem to depend on the expectation that uncertainty will be reduced; sometimes we enjoy the thrill of the unknown. For other theorists, positive (negative) emotions somehow *involve* the desire/goal to continue (stop) a certain activity. This is, I think, an interesting definition of pleasure and displeasure. Yet one can still ask to what extent pleasures involve the desire to continue; we do not want to indulge in all pleasures for the same time, or for a very long time (the expectation of how long a pleasure will last seems to influence the pleasure one feels). I also wonder whether extreme pleasures are pure, and whether one always wants to continue them (the hedonic character of sadomasochistic feelings is an interesting case in this respect). If Plato is right and most of our pleasures contain pain, then often we will be in a situation where we want more and, at the same time, less of it. The bottom question is whether this ambivalent state can be appropriately reduced to the activity of two somewhat 'opposite' systems (e.g. reward and punishment, approach and withdrawal) that support separate phenomenological states (pleasure and displeasure), or rather is a real experiential mixture that depends on the integration (perhaps a dynamical coupling) of these systems.

Panksepp's use of 'valence' does not seem to pose particular problems if understood as 'value-tagging power' (this use is close to the etymology of 'valence'). Yet Panksepp also accepts the idea that some emotional systems feel intrinsically good or bad. For example, CARE always feels good. This is a simplification that overlooks the variety of possible cases of care; it is hard to characterize the feeling of taking care of a loved one who is terminally ill as good or

bad, or even as a duck-rabbit-like state. Perhaps Panksepp would reply that more than one emotional system is at play here (CARE and FEAR, for example), which could explain the mixed hedonic tone. This possibility is interesting, but needs more analysis and discussion; once again, the hard problem is how two separate neural mechanisms can support a phenomenological mixture.

Finally, the explicitly normative characterization of valence raises complications of its own. One can mention several reasons why one should or should not have an emotion. For a consequentialist, an emotion is morally good if it brings about good consequences; despite the simple formulation, what makes a consequence 'good' is itself a complex issue, as moral philosophers know. There are also psychological and holistic reasons that make the normative connotation of 'positive' and 'negative' relative to the context. Take the common case of victims of abuse who feel guilty about it. In this context the transformation of guilt into anger might be seen as a positive event. This does not mean that a victim of abuse should feel angry forever; the point is only that, within the context of certain therapeutic practices, anger can be an emotion that one should at some point cultivate. Consider also how a holistic view of personality can justify traditionally irredeemable and sinful emotions. Goldie (2000) argues — convincingly I think – that character traits like jealousy are intertwined with other traits in such a way that one cannot just take the jealousy away from a person and obtain the same person in an 'ameliorated version.' Character is not a patchwork of separate emotional dispositions, and we cannot simply cross out the ones we do not like while remaining 'the same person.' It thus becomes possible to argue that jealousy, within the whole economy of one's character, is something one does not necessarily want to get rid of.

In addition, what exactly does it mean that one ought, or ought not, to have a certain emotion? Does it mean that one should not express it, or not feel it? In other words, what aspect of the emotion is in question? It is an old moral issue whether it is enough, for sinning, to feel a certain emotion (such as lust, greed, pride, etc.), or whether the sin consists in allowing oneself to take certain actions to indulge in it. Does virtue consist in the absence of sinful feelings, or in the fight against them? These questions relate to issues of mental health as well. What is 'negative' in a psychiatric condition, for example? To feel a certain emotion? Or to not be able to deal with it? Or not to be able to prevent certain behaviours instigated by it? According to the answer, the therapy is likely to be different. The upshot, for present purposes, is that there are several reasons why one should or should not have (or feel, or express) an emotion.

VII: Concluding Remarks

Summing up, we saw that the notion of valence does not originally and etymologically refer to a positive-negative distinction. Since its introduction in psychology (via a tentative and questionable translation) and then specifically in emotion theory, 'valence' has been linked to the tags 'positive' and 'negative' with increasing frequency. More or less inadvertently, it has been used to refer to

different aspects of emotion. At present, the ideas that there are positive and negative emotions, that emotions have positive and negative aspects, and that emotion is valenced all support one another and are interchangeable. This process of regimentation hides many problems. One is that 'valence' often implicitly means many different things; I have tackled this problem by disentangling its meanings. Another problem is that these different meanings tend to be conflated; I have shown in which sense, and claimed that this need not happen. A further, deep problem depends on the dichotomous character of valence, which brings with it the idea that emotion and/or its aspects can be divided into mutually exclusive opposites; I have argued that this notion of valence (and all that comes with it) is too simple.

Whence the allure of valence? Affect valence plays an important role in supporting other uses of valence; what makes something 'positive' or 'negative' in an emotion often comes down, more or less explicitly, to how that something feels. Yet it is naïve to think that affect valence can have the last word and be the brute fact on which to build an objectively dichotomous notion of emotion. The notion of positive or negative experience has normativity built within — it stipulates that some feelings are 'good' and others are 'bad' (in this sense, the 'moralizations of valence' illustrated at the end of section V are not the only normative accounts of valence). Charland's (2005a) view that affect valence is influenced by second-order attentional processes and is thus indeterminate implies that how good or bad our affects feel depends on our values; in short, we feel through our values (this I think is the idea that emotions, thanks to feelings, are 'normative windows to the world'; see Charland, 2005b, this volume).

There might be pragmatic reasons to keep the dichotomous notion of valence. It is evident that 'positivity' and 'negativity' are relative to the context; for example, a behaviour of withdrawal might be called 'negative' for some reason, but it might be adaptive or socially beneficial and hence 'positive' in some other sense (see Solomon & Stone, 2002, for more examples). In the first part of section VI I have argued that the relativity of 'positive' and 'negative' does not allow one to switch back and forth between the valence sign of an emotion and the valence sign of its aspects — there is no necessity for different aspects of emotion to go together (as in the idea that approach is necessarily pleasant) because they have the same 'valence sign'. Yet one could still hold that *in a certain context* it is useful to distinguish positive and negative aspects of emotion; if the context in which the notion of valence appears is clear, the definition of valence explicit, and the relativity of the labels acknowledged, then there should be no problem in using 'positive' and 'negative'.

I mistrust this pragmatic stance. All things considered (section VI), I believe that when it comes to defining and characterizing emotion, the dichotomous notion of valence is a hindrance rather than a useful tool. I find that, in practice, most emotion theorists often keep an ironic distance from the dichotomous character of valence (and associated claims) and acknowledge that 'things in reality are more complicated than that'; yet, at the same time, they seem to accept the dichotomous character of valence and associated claims as an inevitable *status*

quo. My suspicion is that if reality really is more complicated than that, pragmatic irony will at some point have to yield. The view that we can call an emotion and/or its aspect 'positive' or 'negative' *at least for certain purposes* has a dangerous appeal, because that distinction always simplifies and distorts the normal level of complexity, no matter how carefully and ironically it is employed. Also, it reinforces and validates other simplistic descriptions. It induces one to categorize, isolate and circumscribe what are complex and integrated phenomena, and to overlook their temporal developments (with fluctuations in affect, behavioral dispositions, expression, evaluations, etc.).

This descriptive style is too distant from daily lived emotions, and I think this should not and need not be so. My worry is that a tool that is too simple will induce one to overlook complexity, even when one would like to acknowledge it. For example, emotion scientists have extensively investigated 'basic emotions,' and when it comes to 'more complex ones,' things tend to be kept quite simple anyway. Guilt, shame, jealousy, etc. are described as typical, univocal, discrete and static phenomena, different from other phenomena such as e.g. moods, and non-emotional states altogether (but see Ratcliffe, 2005, this volume, for a different view). Dimensional models generally oppose the discrete emotion approach, yet they also tend to downgrade mixtures and complexities to borderline non-prototypical cases.

The difficult question, for those who believe in the possibility of a science of emotion, is: can the dichotomous notion of valence be maintained 'at bottom' and then be somewhat complexified when and if needed? In other words, can it outlast the acknowledgement of the complexities discussed above? The dilemma is evident in Solomon & Stone (2002), who announce: 'our argument is not that there is no such thing as valence or no such polarity or contrasts, but rather that there are *many* such polarities and contrasts' (p. 418), yet recognize: 'opposites depend on polarity, and polarity is just what is *not available* in even the simplest emotions … the game of opposites has *obviously* become *quite* pointless' (p. 433, my italics), and eventually reach the compromise that emotion research should not 'dispense with such distinctions' and yet be more attentive to the phenomenological richness of emotion (*ibid.*). Can this be achieved, and how?

Here I can only hand-wave at issues that still need to be addressed and clarified, and at my own preferred style of investigation. We saw that some authors (including Solomon & Stone) call for 'multidimensional approaches.' This is an interesting strategy, but it needs to be clarified and spelled out in more detail to be assessed. For example: Does Lambie & Marcel's (2002) notion of 'multidimensional hedonic tone' eventually dispense with the bipolar pleasantness-unpleasantness dimension, or can it keep it and somehow build on it? This takes us back to Charland's (2005a) argument: if affect valence is indeterminate, then that dimension is entirely normative and depends entirely on how higher-order level attention turns its gaze to it. Similarly, what becomes of Russell's pleasantness-unpleasantness dimension once one admits that higher-order levels of attention modify and subsume it (cf. Russell, 2003; 2005, this

volume)[8]? Perhaps Varela & Depraz (2005, this volume) are right that valence is a basic organismic disposition. But what exactly do they mean when they claim that '[i]n the case of humans … it is … possible to point to a *multiplicity of valences*' (p. 77, my italics)? How do evolution and development impinge on that basic disposition? Does it outlast the added integration and complexity? In short, what happens to it 'at the fold'?

My preference is real complexification which, as I see it, is not affiliated with a divide-and-conquer strategy that is confident that starting from pure, simple cases can explain the complicated and mixed ones. What is at stake is the variety and richness of our experiences, including the liberty to be uniquely and originally personal (see Campbell's account of 'free-style feelings'; Campbell, 1997). Some theorists seem resigned that emotion theory will, or even should, leave us with a gap between science and daily lived emotions (see Charland, 2005b, this volume). My preference is to try to respect complexity on both sides: in phenomenological descriptions, and in accounts of underlying mechanisms. What use can we make of a science whose conceptual tools fail to capture important features of the phenomena it is meant to describe and explain? I think that, if we want science to 'eventually hold its ground in the experimental "tribunal of experience"' (*ibid.*, p. 96) we should take complexity seriously rather than ironically, and acknowledge it *by default*.[9]

References

Aristotle ([1980]), *The Nicomachean Ethics*, trans. D. Ross (Oxford: Oxford University Press).

Arnold, M.B. (1960), *Emotion and Personality. Vol.1: Psychological Aspects* (New York: Columbia University Press).

Arnold, M.B. & Gasson, J.A. (1954), 'Feelings and emotions as dynamic factors in personality integration', reprinted in *The Nature of Emotion* (1968), ed. M.B. Arnold (Penguin).

Beebe-Center, J.G. (1932), *The Psychology of Pleasantness and Unpleasantness* (New York: Van Nostrand).

Ben-Ze'ev, A. (2000), *The Subtlety of Emotions* (Cambridge, MA: MIT Press).

Bickhard, M. (2000), 'Motivation and emotion: An interactive process model', in *The Caldron of Consciousness: Affect, Motivation and Self-Organization*, eds. R.D. Ellis & N. Newton (Amsterdam: John Benjamins).

Block, J. (1957), 'Studies in the phenomenology of emotions', *Journal of Abnormal and Social Psychology,* **54**, pp. 358–63.

Bradburn, N.M. (1969), *The Structure of Psychological Well-Being* (Chicago: Aldine).

Bradley, M.M. & Lang, P.J. (2000), 'Measuring emotion: Behavior, feeling, and physiology', in *Cognitive Neuroscience of Emotion,* eds. R.D. Lane & L. Nadel (Oxford: Oxford University Press).

Cacioppo, J.T. & Berntson, G.G. (1994), 'Relationship between attitudes and evaluative space: A critical review, with emphasis on the separability of positive and negative substrates', *Psychological Bulletin,* **115**, pp. 401–23.

[8] Russell (2003) writes that mixed feelings depend on the fact that stimuli have different aspects, and so we perceive many affective qualities simultaneously; hence 'ambivalence does not occur as core affect.' Yet, he adds that perceiving many affective qualities simultaneously 'creates a single core affect' (p. 158).

[9]

Campbell, S. (1997), *Interpreting the Personal: Expression and the Formation of Feelings* (Ithaca NY: Cornell University Press).

Charland, L.C. (2005a), 'Emotion experience and the indeterminacy of valence', in *Emotions: Conscious and Unconscious*, eds. L.F. Barrett, P. Niedenthal & P. Winkielman (New York: Guilford Press).

Charland, L.C. (2005b), 'The heat of emotion: Valence and the demarcation problem', *Journal of Consciousness Studies*, **12** (8–10), pp. 82–102.

Damasio, A.C. (2003), *Looking for Spinoza: Joy, Sorrow, and the Feeling Brain* (Orlando: Harcourt).

Davidson, R.J. (1984), 'Affect, cognition, and hemispheric specialization', in *Emotions, Cognition, and Behavior*, eds. C.E. Izard, J. Kagan & R.B. Zajonc (Cambridge: Cambridge University Press).

Davidson, R.J. (1993), 'Cerebral asymmetry and emotion: Conceptual and methodological conundrums', *Cognition and Emotion*, **7**, pp. 115–38.

Davidson, R.J. (1994), 'Asymmetric brain function, affective style and psychopathology: The role of early experience and plasticity', *Development and Psychopathology,* **6**, pp. 741–58.

Davidson, R.J. (1998), 'Affective style and affective disorders: Perspectives from affective neuroscience', *Cognition and Emotion*, **12**, pp. 307–30.

Davidson, R.J. (2000), 'The functional neuroanatomy of affective style', in *Cognitive Neuroscience of Emotion,* eds. R.D. Lane & L. Nadel (Oxford: Oxford University Press).

Davidson, R.J. & Harrington, A. (ed. 2002), *Visions of Compassion* (Oxford: Oxford University Press).

Davidson, R.J., Ekman, P., Saron, C.D., Senulis, J.A., & Friesen, W.V. (1990), 'Approach-withdrawal and cerebral asymmetry: Emotional expression and brain physiology', *Journal of Personality and Social Psychology,* **58**, pp. 330–41.

Davidson, R.J., Coe, C. C., Dolski, I. & Donzella, B. (1999), 'Individual differences in prefrontal activation asymmetry predict natural killer cell activity at rest in response to challenge', *Brain, Behavior and Immunity*, **13**, pp. 93–108.

Davitz, J.R. (1969), *The Language of Emotion* (New York: Academic Press).

Dreyfus, G. (2002), 'Is compassion an emotion? A cross-cultural exploration of mental typologies', in *Visions of Compassion*, eds. R.J. Davidson & A. Harrington (Oxford: Oxford University Press).

Dyer, M.G. (1987), 'Emotions and their computations: Three computer models', *Cognition and Emotion,* **1**, pp. 323–47.

Ekman, P. (1972), 'Universals and cultural differences in facial expressions of emotion', in *Nebraska Symposium on Motivation 1972, Vol. 19* (Lincoln: University of Nebraska Press), pp. 207–83.

Ekman, P. (1982), *Emotion in the Human Face* (Cambridge: Cambridge University Press).

Ekman, P. (1999), 'Facial expressions', in *Handbook of Cognition and Emotion*, ed. T. Dalgeish & M. Power (New York: John Wiley & Sons).

Fernández-Dols, J.M. & Carroll, J.M. (1997), 'Is the meaning perceived in facial expression independent of its context?', in *The Psychology of Facial Expression*, ed. J.A. Russell and J.M. Fernández-Dols (Cambridge: Cambridge University Press).

Frijda, N.H. (1986), *The Emotions* (Cambridge: Cambridge University Press).

Gennaro, R.J. (2000), 'Fiction, pleasurable tragedy, and the HOT theory of consciousness', *Philosophical Papers*, **29**, pp. 107–19.

Gibson, J.J. (1979), *The Ecological Approach to Visual Perception* (Boston: Houghton Mifflin).

Goldie, P. (2000), *The Emotions: A Philosophical Exploration* (Oxford: Oxford University Press).

Goleman, D. (ed.)(1997), *Healing Emotions: Conversations with the Dalai Lama on Mindfulness, Emotions, and Health* (Boston: Shambhala).

Goleman, D. (ed.)(2003), *Destructive Emotions: How Can We Overcome Them?* (New York: Bantam).

Isen, A. (2000), 'Positive affect and decision making', in *Handbook of Emotions. Second Edition*, eds. M. Lewis & J.M. Haviland-Jones (New York: Guildford Press).

Izard, C.E. (1991), *The Psychology of Emotions* (New York: Plenum).

Kenny, A.J.P. (1963), *Action, Emotion and Will* (London: Routledge and K. Paul).

Lambie, J.A. & Marcel, A.J. (2002), 'Consciousness and the varieties of emotion experience: A theoretical framework', *Psychological Review,* **109**, pp. 219–59.

Lang, P.J. (1984), 'Cognition in Emotion', in *Emotions, Cognition, and Behavior*, eds. C.E. Izard, J. Kagan & R.B. Zajonc (Cambridge: Cambridge University Press).

Lang, P.J. (1985), 'The cognitive psychophysiology of emotion: Fear and anxiety', in *Anxiety and the Anxiety Disorders*, eds. A.H. Tuma & J.D. Maser (Hillsdale NJ: Erlbaum), pp. 131–70.

Lang, P.J., Bradley, M.M. & Cuthbert, B.N. (1995), *The International Affective Picture System (IAPS): Photographic Slides* (Gainsville: The Center for Research in Psychophysiology, University of Florida).

Lang, P.J., Davis, M. and Öhman, A. (2000), 'Fear and anxiety: Animal models and human cognitive psychophysiology', *Journal of Affective Disorders,* **61**, pp. 137–59.

Lazarus, R.S. (1991), *Emotion and Adaptation* (New York: Oxford University Press).

Lewin, K. (1935), *A Dynamic Theory of Personality: Selected Papers,* trans. D.K. Adams & K.E. Zener (New York: McGraw-Hill).

Ortony, A., Clore, G.L. & Collins, A. (1988), *The Cognitive Structure of Emotions* (Cambridge: Cambridge University Press).

Osgood, C.E. (1952), 'The nature and measurement of meaning', *Psychological Bulletin,* **49**, pp. 197–237.

Osgood, C.E. & Suci, G.J. (1955), 'Factor analysis of meaning', *Journal of Experimental Psychology,* **50**, pp. 325–38.

Panksepp, J. (1998), *Affective Neuroscience* (Oxford: Oxford University Press).

Panksepp, J. (2000), 'The neuro-evolutionary cusp between emotions and cognitions: Implications for understanding consciousness and the emergence of a unified mind science', *Consciousness and Emotion,* **1**, pp. 27–56.

Panksepp, J. (2005), 'On the embodied neural nature of core emotional affects', *Journal of Consciousness Studies*, **12** (8–10), pp. 158–84.

Picard, R.W. (1997), *Affective Computing* (Cambridge MA: MIT Press).

Plato ([1993]), *Philebus,* trans. E. Freda (Indianapolis: Hackett).

Prinz, J.J. (2004), *Gut Reactions: A Perceptual Theory of Emotion* (New York: Oxford University Press).

Ratcliffe, M. (2005), 'The feeling of being', *Journal of Consciousness Studies*, **12** (8–10), pp. 43–61.

Reinman, E.M., Lane, R.D., Ahern, G.L., Schwartz, G. & Davidson, R.J. (2000). 'Positron emission tomography in the study of emotion, anxiety, and anxiety disorders', in *Cognitive Neuroscience of Emotion,* eds. R.D. Lane & L. Nadel (Oxford: Oxford University Press).

Rozin, P. (2003), 'Introduction: Evolutionary and cultural perspectives on affect', in *Handbook of Affective Sciences,* ed. R.J. Davidson, K.R. Scherer & H.H. Goldsmith (Oxford: Oxford University Press).

Russell, J.A. (1980), 'A circumplex model of affect', *Journal of Personality and Social Psychology,* **39**, pp. 1161–78.

Russell, J.A. (2003), 'Core affect and the psychological construction of emotion', *Psychological Bullettin,* **110**, pp. 145–72.

Russell, J.A. (2005), 'Emotion in human consciousness is built on core affect', *Journal of Consciousness Studies*, **12** (8–10), pp. 26–42.

Russell, J.A. & Carroll, J.M. (1999), 'On the bipolarity of positive and negative affect', *Psychological Bulletin,* **125**, pp. 3–30.

Russell, J.A. and Fehr, B. (1987), 'Relativity in the perception of emotion of facial expressions', *Journal of Experimental Psychology: General,* **CXVI**, pp. 223-237.

Russell, J.A. & Fernández-Dols, J.M. (ed. 1997), *The Psychology of Facial Expression* (Cambridge: Cambridge University Press).

Russell, J.A. & Mehrabian, A. (1977), 'Evidence for a three factor theory of emotion', *Journal of Research in Personality,* **11**, pp. 273–94.

Schlosberg, H. (1941), 'A scale for the judgment of facial expressions', *Journal of Experimental Psychology,* **29**, pp. 497–510.

Schlosberg, H. (1952), 'The description of facial expressions in terms of two dimensions', *Journal of Experimental Psychology,* **44**, pp. 229–37.

Schlosberg, H. (1954), 'Three dimensions of emotion', *Psychological Review,* **61**, pp. 81–8.

Schneirla, T.C. (1959), 'An evolutionary and developmental theory of bi-phasic processes underlying approach and withdrawal', in *Nebraska Symposium on Motivation*, ed. M.R. Jones (Lincoln: University of Nebraska Press).

Smith, C.A. & Scott, H.S. (1997), 'A componential approach to the meaning of facial expressions', in *The Psychology of Facial Expression,* eds. J.A. Russell & J.M. Fernández-Dols (Cambridge: Cambridge University Press).

Solomon, R.C. & Stone, L.D. (2002), 'On 'positive' and 'negative' emotions', *Journal for the Theory of Social Behaviour*, **32**, pp. 417–35.

Titchener, E.B. (1908), *Lectures on the Elementary Psychology of Feeling and Attention* (New York: Macmillan).

Tolman, E.C. (1932), *Purposive Behavior in Animals and Man* (New York: Century).

Tomkins, S.S. (1962/1963), *Affect, Imagery, Consciousness* (New York: Springer).

Tomkins, S.S. (1970), 'Affect as the primary motivational system', in *Feelings and Emotions*, ed. M.B. Arnold (New York: Academic Press).

Tucker, D.M. (1981), 'Lateral brain function, emotion and conceptualization', *Psychological Bullettin,* **89**, pp. 19-46.

Varela, F.J. & Depraz, N. (2005), 'At the source of time: Valence and the constitutional dynamics of affect', *Journal of Consciousness Studies*, **12** (8–10), pp. 61–81.

Watson, D. & Tellegen, A. (1985), 'Towards a consensual structure of mood', *Psychological Bulletin,* **98**, pp. 219–35.

Watson, D., Clark, L.A. & Tellegen, A. (1988), 'Development and validation of brief measures of positive and negative affect: The PANAS scales', *Journal of Personality and Social Psychology,* **54**, pp. 1063–70.

Wundt, W. (1907), *Outlines of Psychology* (Leipzig: Englemann).