

## Time, Emotion, and Depression

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### Abstract

I examine several aspects of the experience of time in depression and in the experience of different emotions. Both phenomenological and experimental studies show that depressed subjects have a slowed experience of time flow and tend to overestimate time spans. In comparison to patients in control conditions, depressed patients tend to be preoccupied with past events, and less focused on present and future events. Recent empirical findings in studies of emotion perception show different degrees of over- or underestimation of time in perception of faces showing different emotions compared with neutral faces. Clinical phenomenology predicts that the effects on time estimation would not be additive if these tests were conducted with depressed subjects.

### Keywords

depression, emotion expression, time, phenomenology

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“From Time sadness borrows wings”  
La Fontaine (*The Young Widow*)

### Introduction

The concept of time enters into the way that we discriminate emotions, moods, and depression. On one view, long-term affective states are better considered moods rather than emotions. Moods are considered

diffuse, slow-moving feeling states.... By contrast, emotions are quick-moving reactions that occur when organisms encounter meaningful stimuli that call for adaptive responses. Emotional reactions typically involve coordinated changes in feeling state, behavior, and physiology, and last seconds or minutes. Moods, by contrast, exert their clearest effects on feeling states and cognitions (as opposed to behavior and physiology) and last hours or days. (Rottenberg 2005, p. 167).

Clinical depression is considered a mood disorder, involving “changes in moods but ... not necessarily ... changes in emotional reactions” (Ibid.).

In truth, however, emotions vary from short-term to long-term. Some emotions are

instantaneous in making their appearance. Fear, for example, can happen before we know it (Le Doux 1996). Elation seems relatively quick and tends to be short lived. In contrast, if not at first sight, it takes some people significant time to fall into love and often more time to get over it. Some emotions can become habits and last for a long time. Compassion can be cultivated and we can say of a person not just that they behave compassionately on occasion, but that they are compassionate, meaning that the emotion of compassion permeates their life, even if the feeling manifests itself only on the proper occasions. Pride can work in a similar way.

Accordingly, it is only a rough approximation to line things up in regard to temporality in this way: moods, emotions, feelings, where the inclination is to associate longer time periods with moods, and the shortest time periods with feelings (i.e., emotional experiences). It's rough because emotions do not fit nicely into an intermediate time frame. Be that as it may, starting with the above general indication from Rottenberg, I'll consider some emotions to be shorter term than some moods, and shorter than depression. All of these considerations pertain to measuring emotions and moods in terms of clock or objective time, however. In this paper I intend to focus on phenomenological aspects of time, that is, how time is experienced in emotions and in depression.

Here is a paradoxical finding that seemingly pits the neurological against the phenomenological. On the one hand, and very much in line with the generally accepted idea that longer-term major depression facilitates shorter-term sad emotional reactions – the *mood-facilitation hypothesis* (see Rosenberg 1998) -- neurological studies find that depression introduces a negative bias and intensifies the emotional experience of negative environmental cues including intersubjective (or social) cues. Depressed subjects, when shown images of depressed, sad, or angry faces, produce greater amygdala responses compared to control subjects (Victor et al. 2010). On the view of the experimenters, “negative emotional-processing biases occur automatically, below the level of conscious awareness, in unmedicated, currently depressed people...” (2010, 1134).

On the other hand, studies by Rottenberg et al. (2002a&b; see Rottenberg 2005) show that in depressed subjects experiential, behavioral, and physiological reactions to a sad film were similar to and of similar magnitude to those of controls. Indeed, depressed subjects reported smaller increases in sad feelings in response to the sad film than did healthy controls. They also reported greater sadness than healthy participants in response to a neutral film. This suggests, according to Rottenberg (2005, p. 169), “depression flattens the emotional landscape, greatly constricting the range of emotional reactions to differing emotional contexts.”

Should we believe the amygdalae or the patients? Is sadness intensified or flattened by depression? There are two things to note that mitigate the paradox. First, note the temporal difference in the stimuli. In the first study an image of a

sad face was presented for 26 ms, i.e., below the level of explicit conscious awareness, followed by a backward masking task. That is, the images were presented so quickly the subjects were not aware of what they saw, or even that they saw e.g., a sad face. Such very fast stimuli are sufficient to activate the very fast amygdala. In the Rottenberg study the sad film lasted 170 seconds, or in other words, close to an eternity in neuroscientific terms; in phenomenological terms, long enough to register and settle into consciousness. The contrast naturally motivates the question of how one defines sadness – via registration at the amygdala or registration in consciousness. In this regard, second, note that amygdala activation partly correlates with arousal (Gläscher and Adolphs 2003; Skuse, Morris and Dolan 2005), which may accompany emotional reactions of different sorts (fear, anger, sadness) and may complicate claims that the very fast amygdala reaction correlates in a specific way with one of these emotions. I'll set the definitional issue aside, however, in order to focus on the temporality issue.

So far, in these experiments, we are still talking about objective time; 26ms vs 170s; these are quantities measurable on the clock. I'm more concerned with the longer time period only because that gets us into the question of consciousness. With respect to consciousness, however, we also have to consider experiential (phenomenological or lived) time, which is distinct from objective time. While there is no sense at all in talking about experiential time with respect to 26 ms (since anything that starts and stops within a window of 30 ms is not experienced – which is not to say that it does not affect experience or show up on later behavioral measurements – see e.g., Marcel 1983), we can say that experiential aspects of temporality do come into the 170s framework. To put it most crudely, we can experience 170s as a long or a short amount of time, relatively speaking. The concept of experiential time is often explained by citing the common knowledge that time flies when you are having fun; and time drags when you are bored. In addition, we know from various clinical and experimental studies that there are differences in experiential time in depressed subjects compared to non-depressed subjects. Can such differences in experiential time tell us anything about the experience of emotions in depression?

### **Experiential time, depression, and emotional experience**

For a long time psychologists have been measuring time perception and time judgment in depressed patients. They continually confirm that depressed subjects have a slowed experience of time flow and that they tend to overestimate time spans (Bschor et al. 2004; Mahlberg et al. 2008). In comparison to controls, depressed patients tend to be preoccupied with past events, and less focused on present and future events, and to report longer time spans for present story productions (Wyrick and Wyrick 1977). The empirical studies are consistent with the interpretation proposed by Minkowski (1970) from a clinical-phenomenological perspective. In saying they are consistent I do not mean that they address precisely the same aspects of temporality. Experimental studies often emphasize changes in perceived (measurable) *duration*, whereas Minkowski focuses on changes in the *structure* of temporal experience, where

many different structural changes are possible. Minkowski thus distinguishes between the ideo-emotional aspect of a disorder, i.e., the specific content of the subject's experience, and the structural or *generating disorder*, which in some cases turns out to be a disorder of experiential temporality. The latter involves a modification to the structural aspects of experience and not simply to the intentional or phenomenal aspects. Thus, for Minkowski the cognitive and emotional expressions that are associated with something like depression are generated by a more profound disorder which affects the very structure of experience, and often the temporal structure of experience. If we take away the various ideas, feelings, and volitions of mental life – what we might call the surface phenomenology – what's left? The deeper structure – the way that “the *living ego situates itself in relation to space and time*” (p. 251) where time means not objective measurable time, but lived time.

Minkowski, citing the work of Straus (1947), and his own clinical encounters, notes that experiential time in depression “seems to slow down remarkably, even to stop; and this modification of the temporal structure seems to be interposed between the subjacent biological disorder, on the one hand, and the usual clinical symptoms on the other” (298).<sup>i</sup> Connected with this slowing down of time, there is a reorientation away from the future towards present and especially past dimensions. Minkowski explains obsessive (counting, checking, ruminating) behavior, sometimes found in depression, in these terms, suggesting that obsessive behavior may play a compensatory role.<sup>ii</sup> E.g., counting and actually keeping precise track of objective time “can give rise to the idea of a progression – a mechanical progression that is – of time. This progression, or rather this illusion of progression, comes to fill in for the weakening dynamism” (Minkowski 1970, 299). If this fails, and at the extreme when time seems to stop, Minkowski suggests, psychotic delusion can result.

Minkowski cites the case study of a depressed patient reported by Gebattel. The patient engages in obsessive counting of days, minutes, seconds involved in events surrounding her. Her description of her ongoing obsessive thinking about her own speech suggests that she is entirely focused on the phenomenological process described by Husserl as the retention of just-past experiences. “When I talk to you the word ‘talk’ fades away, then the word ‘face’. Words fade away first of all, then the letters. It all goes in bits” (cited in Minkowski, 1970, 301). In this framework nothing has significance – everything just passes. Minkowski explains that “It is in the orientation of our life toward the future which gives it a meaning, a direction: when this orientation is missing, everything seems to amount to the same thing, seems stupid, without rhyme or reason ...” (303) – and this is just what the depressed patient describes. Her affective life is dominated by anxiety, “constant anguish.” although she can also experience reduced degrees of emotion: “It is true that I am happy when someone gives me something or when someone is nice to me, but what is terrible is that basically everything is the same to me. This is so pronounced at certain moments that I can't do anything, can neither get up nor get dressed because everything is the same” (302).

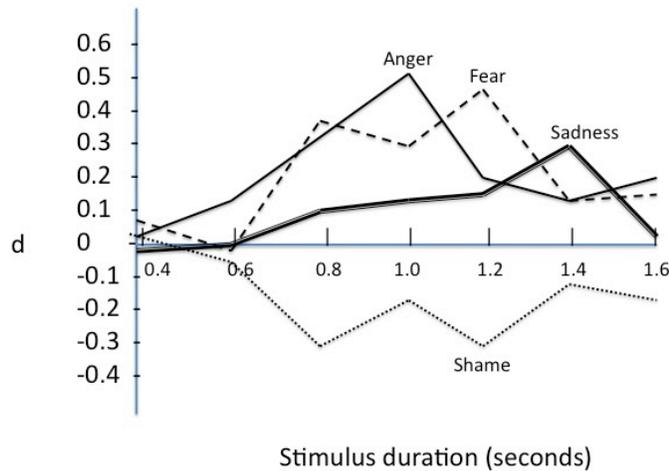
The relation between experiential time and emotion has not been explored as much as temporal experience in depression. Recent studies, however, have started to provide some indication that different emotions involve different temporal experiences. One question that complicates such studies is whether bare emotions – e.g., fear or sadness – or some other aspect of experience or cognition that might accompany the onset of the emotion, for example, arousal or attentional aspects, generate this experiential time difference. A number of studies have indicated that sadness is associated with a low arousal level and a slowing down of cognitive and motor activity (Barr-Zisowitz 2000; Russel 1980; Schwartz et al. 1981). The relationship between sadness and level of arousal, however, is complex depending on the motivational states elicited in a specific experimental context (Izard 1991; Lazarus 1991). Thus, Gil and Droit-Volet (2009) suggest that the level of arousal may increase when a subject perceives sadness in another person, increasing the subject's motivation to understand the distress.

The methodological and design aspects of many of the studies of experiential time in emotional experience make a controversial assumption based on a simulationist approach to social cognition. They assume that when one subject encounters another person (or even a picture of the face of another person) expressing sadness, for example, there will be some imitation or simulation of that sadness in the subject's own emotion system. “[P]erceiving another person's emotional expressions and thinking about emotion automatically produce ‘perceptual, somatovisceral, and motoric re-experiencing (collectively referred to as ‘embodiment’) of the relevant motion in one's self” (Droit-Volet and Meck 2007, 504; citing Niedenthal 2007; also see Gallese 2005). On this interpretation, however, it may be difficult to explain why we may experience fear rather than anger when we see an angry person coming towards us. We leave aside these and other issues pertaining to the simulationist interpretation for purposes of this paper (but see Gallagher 2008 for further discussion).

Droit-Volet et al. (2004) presented images of faces expressing sadness for a brief time (between 400 and 1600 ms) to normal, non-pathological adults. Subjects overestimated the duration of the presentation of these faces compared to neutral faces. The experimenters attribute this to an increase in the level of arousal since, more generally, the subjective experience of time seems longer than normal due to increases in arousal (see Droit-Volet and Meck, 2007). Noulhiane et al. (2007), looking at emotional auditory stimuli, suggest that the effects of emotion on time perception may be relatively short-lived and are maximal for auditory stimuli around 2 s. Negative sounds were overestimated compared to positive ones, perhaps because negative stimuli produce a greater increase in arousal. Under high-arousal conditions, the duration of negative pictures was also overestimated; that of positive pictures underestimated. In contrast, in the low-arousal condition, negative pictures were underestimated and positive pictures were overestimated.

Droit-Volet and Meck (2007) report on an unpublished study by Gil and Droit-Volet which shows different degrees of overestimation of duration of presentation

for images of a face showing anger, fear, and sadness, and underestimation for an image of shame, compared with neutral faces (Figure 1).



**Figure 1.**  $d$  is the difference between the proportion of responses for an image of an emotional facial expression and for a neutral expression. If  $d$  is greater than zero, this indicates that time of presentation for the emotional image is overestimated compared with the neutral expression; if  $d$  is less than zero it indicates that the time of presentation for the emotional image is underestimated compared with the neutral image. (Graph is summation of results for adults presented in Droit-Volet and Meck 2007).

On the one hand, consistent with the mood-facilitation hypothesis, the idea that, for example, depression facilitates sad emotional reactions, the experience of various emotions by depressed subjects should introduce some modulation in experienced time. Thus, since depressed patients have been shown to exhibit an affective bias for negative stimuli (Murphy et al. 1999), one might think that the affective state of sadness in depressed individuals should modulate their time perception in such a way that they experience time as passing even more slowly (Gil and Droit-Volet 2009). This, however, may be complicated by the effects of arousal or the fact that depressed subjects show impairment in ability to shift the focus of attention away from the presented stimulus.

On the other hand, it's not clear that the effects on time experience would be additive. If, as indicated by the studies by Rottenberg et al. (2002 a&b), there is some indication that depression "flattens the emotional landscape," it may have a similar effect on differences in experiential time that are usually associated with emotional experience. That is, if depressed patients do not feel anger or fear or even particular instances of sadness or shame as strongly as non-depressed subjects, then the time modulation associated with such emotions may not be as strong.

So far, then, psychological experiments with depressed subjects have not been able to distinguish the effects of depression versus the effects of specific emotions on

temporal experience. Can phenomenology do any better?

### **Ambivalent depression**

Minkowski's analysis of Gebattel's patient seems to confirm the idea that depressed patients may not feel anger or fear or even particular instances of sadness or other emotions as strongly as non-depressed subjects. As a result differences in experienced time connected with these emotions may not manifest themselves clearly, or they may be overridden by the particular temporal experience associated with depression itself.

Minkowski provides some insight in his discussion of one of his own depressed patients, a 26-year-old male diagnosed with clinical depression. The patient complains of an absence of a feeling of accomplishment and a lack of connectedness among his actions.

Things that I do are like dead things to me. I do not relate them to the present.... When I speak, I have the impression that my words do not correspond to my thoughts, but I have the impression of not being able to stop speaking.... When I do something, I have the feeling that I am not there. I cannot estimate the time it takes.... I no longer have that something which projects itself ahead.... I feel displaced in relation to life. I feel time flee.... I lack a reference to time.... Thus I am gripped by anguish. I am afraid for myself; but this is not a moral fear; it is a bestial fear, the fear of a beast who is no longer there. (Minkowski 1970, 332).

The patient also complains about the speed of events, the inability to follow the movements of others, and even the inability to see moving objects. He suffers stress if he is made to hurry.

I live in instantaneousness. I don't have the feeling of continuity anymore. I have the sensation of a void before me, of a void in the immediate future.... I feel time flowing, but I have no notion of how much time has passed.... I no longer feel the passage from one day to the next. I no longer have the sensation of waking up in the morning.... I have the impression of being someone in a state of somnambulism or of lethargy.... I have the anguish of having before me a day just like the one before.... I exist in the present only in idea but neither in feeling nor emotively. I am obsessed by the past. The images of my past go by like the scenes in a cinema, but I do not attach them to the present; I observe them like a spectator. (333-335).

The patient expresses a feeling of remorse ("mental regret") about past events in his life, some anger towards his father, but especially an overarching anxiety, not about the future, but about his present condition – his lethargy, his inability to feel or emote, and the insignificance of everything – and his feeling that nothing will

change about this.

Minkowski provides ten pages of the patient's own words, and at the end of the narrative he makes an insightful point. He suggests that in contrast to the depressed subject, time "retains its *complete value*" in the non-pathological subject. Perhaps it would be better to say that emotional value, the very valence of events, other people, and things depends upon an intact and properly organized experiential temporality. Emotions are not missing in the depressed subject, but they lose some significant degree of positivity or negativity because of the overarching temporal structure of depression. In many cases, something is positive or negative relative only to our possible actions or to our future plans. Without an orientation towards the future, the depressed subject has difficulty experiencing the valence of things and loses a degree of emotional valency.<sup>iii</sup> His report of an overarching anxiety seems to be an emotional experience motivated by the lack of emotional valency; anxiety as a nihilistic spectatorial experience in the face of the lack of possibilities, a lack of movement.

The time structure of depression is like the time-structure of boredom; time slows down in both cases. Unlike boredom, which is a negative underlain by a desire that things be otherwise, depression, as Minkowski points out, seems to lack that desire, or the possible "otherwise," in so far as the future closes down and does not allow for desire. As Minkowski puts it, depression is to boredom as ambivalence is to hesitation. In the case of hesitation we are confronted with two objects or possible actions that we, temporarily, cannot decide between. Both perhaps are desirable, and on the other side of hesitation, something will be done in favor of the more desirable. I will make a choice. In the same way, boredom suggests that there is an option that we can decide – to remain as we are, or to do something different and stop being bored. We can see the latter as a positive possibility that we can pursue. In the case of depression, we are confronted with ambivalent circumstances – neither positive nor negative – and this prevents us from deciding, which means that we remain as we are and have been. Minkowski thus refers to "ambivalent depression" (348). Concerning the patient's expressions of anger, regret and remorse, Minkowski notes that they do not have "their usual tonality" (342). They are more affected than affective.

This lack of "usual tonality," then, suggests that experiments of the sort conducted by Gil and Droit-Volet on emotion perception, if done with depressed subjects, would be rather boring. That is, the phenomenology of depression predicts that overestimation or underestimation of the duration of presented emotion stimuli would not vary much from a baseline established for depression itself. The degree of variation in time estimation between presentation of neutral faces and presentation of emotion faces should be negligible, and the degree of variation in time estimation between presentation of different emotion stimuli should be less than in the normal case. In this respect, pursuing La Fontaine's metaphor, if the "wings of time" are broken, sadness won't fly very high. Whether such predictions are correct, however, will have to wait on the experiments.

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## Notes

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<sup>i</sup> Straus and Minkowski suggest, without further specification, that the temporal modification is the result of the biological disorder. Contemporary theories point to problems in neural timing mechanisms. Referencing internal-clock models Droit-Volet and Meck (2007), for example, explain that dopaminergic modulation of cortical oscillation frequencies modulate cortico-striatal circuits involved in timing and time perception, although, as they note, considerable debate about how these circuits encode and decode time continues.

<sup>ii</sup> I note that Minkowski discusses a range of subtly different cases which he does not attempt to group all together as depression. He suggests that in practice it's difficult to draw clear distinctions between depression and other conditions such as schizophrenia (for example, he discusses a case of 'schizophrenic melancholia'). For that reason we need to be careful in drawing general conclusions about "depression" from Minkowski's texts.

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<sup>iii</sup> One of the anonymous reviewers of this paper suggested that in this regard one should investigate the experience of guilt in depression. “Guilt, like anxiety, seems to be enhanced through depression, rather than diminished. Whilst the blocking of future possibilities would seem to prevent meaning in many areas, it seems likely that this blocked future would prevent the subject from overcoming feelings of guilt.” It seem right to suggest that feelings of guilt could be affected by the temporal structure of depression and that this might impact upon estimations of elapsed time. A second reviewer raised a related point about the effect of past-related emotions rather than those that would have direct bearing on the future. Guilt would surely count as past related. Would the effect of depressed mood and the negative emotion of guilt on temporal experience be non-additive as well? One possibility suggested by Minkowski and by the reviewer is that loss of future drive has an effect on past experience since the past takes on the experienced significance it does in relation to our future directions. To answer such questions further research is required. Clearly I am entitled only to the conclusion that depressed mood and future-directed emotions will affect temporal experience in a non-additive way.