



**Case conceptualization from a process-based and modular perspective:  
rationale and application to mood and anxiety disorders:**

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## Abstract

This article presents the theoretical, clinical, and practical arguments supporting a process-based transdiagnostic approach to psychotherapy. A working definition of “psychological process” is provided, as well as a tri-dimensional categorization of psychological processes potentially involved in psychopathology. Guidelines are proposed to select psychological interventions based on the active psychopathological processes evidenced in a given case. We also provide a rationale to organize treatment as a set of modules, each addressing a specific psychopathological process. Next, we review the main processes that may be active in mood and anxiety disorders, and that are accessible to clinicians in regular practice. For each process, we propose a validated assessment questionnaire. Finally, we offer a free-access web-based instrument that allows clients to fill in these questionnaires via an internet survey, and that provides therapists with a tool to easily decode and interpret the questionnaire results, and to present them to the clients.

Key-words:

Case conceptualization, diagnostic, assessment, transdiagnostic processes, modular protocol, anxiety, depression

## **Case conceptualization from a process-based and modular perspective: rationale and application to mood and anxiety disorders**

Since the 1980s, psychotherapy has known a remarkable development due to intense scientific activity investigating psychopathological processes and the effects of psychological interventions. The clinician now benefits from a wide range of psychotherapeutic treatments whose efficacy is attested by rigorous scientific methods. The hallmark of this scientific validation is the randomized clinical trial (RCT), which originates from medical research. This approach requires that a treatment shows a greater efficacy in reducing symptoms than a credible placebo, or an efficacy similar to an already well-established treatment, in order to be validated (American Psychological Association, 1995; Foa & Meadows, 1997; Maxfield & Hyer, 2002). These symptoms are based on psychiatric diagnoses as defined by international classification (DSM, ICD). Beyond its methodological rigor, the RCT approach focuses on “symptomatic efficacy”, which is the capacity of a treatment to reduce the symptoms defining diagnostic criteria.

While recognizing its tremendous contribution, some have stressed the shortcomings of the diagnosis-based treatment approach (Barlow, Bullis, Comer, & Ametaj, 2013). These shortcomings include the fact that theoretical validity (is the treatment based on an empirically sound theory?) and process validity (is the treatment effective through its action on the processes it claims to target?) have been neglected. However, these two types of validity are as important as symptomatic validity. Theoretical validity is part of the cross-fertilizing interplay between theory and practice that generates rich and new developments for both fields; it is a necessary ingredient for the development of new interventions. Process validity is necessary to identify the active ingredients of an intervention, and is thus essential for optimizing it (Salkovskis, 2002).

Another shortcoming concerns the external validity of empirically validated treatments (are the effects of the treatment transferable to the population targeted in ordinary clinical practice?). Typically, outcome research is carried with samples of clients presenting a very specific disorder with no, or few comorbidities. However, in everyday practice, comorbidity is the rule rather than the

exception. This issue might be addressed through research dissemination, which is unfortunately often underdeveloped (Wilson, Petticrew, Calnan, & Nazareth, 2010).

A third shortcoming is that outcomes research has mostly targeted specific disorders, as listed in the DSM 5 (American Psychiatric Association, 2013). Nevertheless, clinicians can observe diverse states of psychological suffering that necessitate treatment, but for which there are no recognized diagnosis (e.g., the consequences of harassment).

A fourth problem rests on the common critique of the poor reliability of diagnostics as determined by the DSM or ICD (Chmielewski, Clark, Bagby, & Watson, 2015). Finally, and most importantly, diagnostic classifications, such as the DSM or the ICD, are based on a consensus regarding symptom clustering and explicitly avoid referring to underlying pathogenic processes (with some exception like PTSD or adjustment disorder). However, logically, treatments should foremost target the processes precipitating or maintaining a disorder, rather than their manifestations as symptoms.

### **The transdiagnostic process-based approach**

In order to address these shortcomings, a new treatment approach proposes to target the etiological processes that precipitate or maintain psychological disorders. It is based on two postulates: the premise that psychological processes determine mental disorder, and the observation that some processes are active in several diagnoses. Hence, in many cases, this process-based approach is also transdiagnostic.

The postulate of the primacy of psychological processes is well developed in a model proposed by Kinderman and collaborators (Kinderman, 2005, 2009; Kinderman & Tai, 2007). Questioning the traditional perspective that mental disorders are conjunctly determined by biological, psychological, and social factors (the bio-psycho-social perspective), these authors proposed that mental disorders are directly determined by psychological processes. Evidently, these psychological processes might themselves be determined by biological or social factors, as well as by life events and circumstances. However, these latter factors can only influence mental disorders through mediating

psychological processes. Indeed, by their own definition, mental disorders are the direct results of the disturbance of some psychological processes.

This process-based perspective has implications for diagnosis. Indeed, some processes are present in different diagnostic categories. For instance, abstract and evaluative repetitive thinking has been evidenced in the generalized anxiety disorder (Borkovec, 2002), in major depression (Watkins, 2008), and in alcohol dependency (Grynberg, Briane, de Timary, & Maurage, 2014). This observation, together with the fact that comorbidity is so frequent when using DSM or ICD classifications, has led many authors (e.g., Ehring & Watkins, 2008 ; Harvey, Watkins, Mansell, & Shafran, 2004) to advocate for a transdiagnostic approach. This approach, similar to the process-based approach, states that psychological treatments should target etiopathological processes rather than diagnoses. Note, however, that all processes are not necessary transdiagnostic. Indeed, some processes may be specific to a particular diagnosis. For instance, thought-shape fusion (i.e., the belief that simply thinking about food might cause weight gain) is a process that is only observed in eating disorders (Coelho, Baeyens, Purdon, Pitet, & Bouvard, 2012).

### **The notion of process in psychopathology**

A central issue for the process-based transdiagnostic approach is to define what a process is and which processes contribute to mental disorders. Although the notion of process is widely used in the psychological literature, a clear definition is difficult to find. In their monograph on the transdiagnostic approach, Harvey and colleagues (2004) define a psychological process as “an aspect of cognition (e.g. attention, memory, reasoning, thinking) or of behaviour (e.g. overt or subtle avoidance) that might contribute to the maintenance of a psychological disorder” (p. 14). Unfortunately, this definition is broad, encompassing basically the whole domain of cognitive psychology. Foremost, for defining psychopathological process, this definition is rather circular. A systematic PsychInfo search combining the keywords “process” and “definition” led to no definition of what a psychological process is, except for one paper attempting to specifically define what an analytic process in psychoanalysis would be (Vaughan, Spitzer, Davies, & Roose, 1997).

Furthermore, in the literature, the notion of psychological process is often used interchangeably with other concepts such as those of “mechanism”, “factor”, “cause”, “determinant”, or even “symptom”.

In our view (Philippot, 2016), the notion of psychological process implies the transformation of a psychological element. By psychological element, we mean any element or input implicated in psychological phenomena, be they implicit or explicit, such as a percept, a sensation, a memory, a judgment, a mental image, a representation, or a motor command. Other elements, which might not be considered as psychological per se, might be akin to a psychological element, for instance changes in physiological or nervous activities. We label these “parent-elements”. They refer to elements that belong to another (but closely related) epistemological level than the psychological one, such as the biological or social levels. Such parent-elements might also be involved in psychological processes, as long as other properly psychological elements are also implicated. A psychological process is thus a mechanism that transforms a psychological element into another psychological element (for instance, a process that transforms a conceptual representation into a mental image), or a mechanism that transforms a parent-element into a psychological element (for instance, a process that transforms a physiological change into a body sensation), or a mechanism that transforms a psychological element into parent-element (for instance, a mental representation is transformed in muscular and ventilatory activities, as when expressing a thought into speech).

A process is thus essentially dynamic, as indicated by its Latin etymology “*pro*” (forward) and “*cessus, cedere*” (to march, to progress). It implies an input and a transformation of that input into an output. For instance, abstract general repetitive thinking has been proposed as a key psychological process in the maintenance of mood disorders and of general anxiety (Watkins, 2008). The inputs of this process might include representations (such as images, concepts, autobiographical memories) or stimuli perceived in the environment, both of which are psychological elements. A concrete example would be the mental image of a car accident that suddenly pops into John’s mind. This input automatically activates thoughts about the possibility that John’s wife has a car accident on her way back from work. These thoughts feed into John’s generalized anxiety schema (Teasdale, 1993), which, on the one hand, activates anxiety, and on the other hand, feeds back into catastrophizing

about something terrible happening to his wife. These reciprocal activations generate a feedback loop that is manifested in overgeneral repetitive thinking (Teasdale, 1996).

Given their dynamic and transformational nature, processes are malleable. In other words, one can act upon these processes and modulate them in such a way as to change their nature or intensity. For instance, abstract repetitive thinking can be either downplayed by investing mental resources in a concurrent task (e.g. John can decide to start cooking a new complicated recipe, which might reduce or inhibit his worries) or by changing the nature of the process (e.g. John might attempt to think very concretely about the possibility of a car accident happening to his wife, rather than thinking about it in a general, abstract way). These changes in process intensity or nature will impact on John's mood and anxiety (Watkins, 2004).

From the preceding definition of processes, the difference between psychopathological processes and symptoms is clear. A symptom is often the result (output) of the activation of a process but it is not a process in itself. A symptom does not transform psychological elements. For instance, depressed mood (a symptom) might be the result of overgeneral, abstract repetitive thinking (a process). Depressed mood is here considered as the output of abstract repetitive thinking.

The processes that underlie the etiology of psychopathology should be distinguished from: a) change processes in psychotherapy, which refers to the active ingredients in the psychotherapeutic process, or b) change mechanisms, which refers to intermediate changes in the client during the course of treatment. These two constructs, for which there is an extant literature (e.g. Crits-Christoph, Gibbons, & Mukherjee, 2013; Doss, 2004; Kazdin, 2007), address treatment mechanisms, not the factors that precipitate or maintain a disorder.

It should be noted that the definition of psychological process proposed in this section is intimately related to case conceptualization. It is part of an attempt to explain the psychological functioning here and now of a person suffering from a psychological disorder. This case conceptualization articulates dynamic and transformative relations between the representations a person holds, his/her interpersonal context, life experiences, memories and perception (Persons, 2008). As such, whether a psychological phenomenon is a process depends in part upon the perspective taken by the clinician, i.e. the function he or she ascribes to the psychological

phenomenon considered in a case conceptualization. Hence, in a given perspective, a psychological phenomenon might be considered as an output or symptom, while in another perspective, it would be considered as a process. For instance, the phenomenon of mental rumination (specifically defined as abstract, overgeneral, repetitive thinking) has been conceptualized as a the result of a process of behavioral deactivation –non activity opening a mental space for the mind to wander (Hopko, Lejuez, Ruggiero, & Eifert, 2003; Martell, Addis, & Jacobson, 2001). In this case, the process of behavioral deactivation transform the mental space in such a way as to produce mental rumination. In this perspective, the phenomenon of rumination, not transforming anything, is considered as a symptom, the output of the process of behavioral deactivation. Yet, from another perspective it could be argued that rumination is a process in itself: It transforms thoughts into a depleted mood. In the first perspective, this phenomenon is not ascribed any transformative function, while the opposite is true in the second perspective. This aspect of transformative function is a central defining element in distinguishing process from symptom.

Hence, the definition of psychological process proposed here is foremost functional. It aims at offering the clinician a conceptual framework with which to model a case, and with which to build a functional analysis integrating different types of processes. This functionalist approach entails a certain degree of subjectivity, as the interpretation of the observed phenomenon is partly dependent upon the clinician's perspective.

It should be noted that while a process necessarily has a transformative function, it cannot be equated to a function, insofar as an object cannot be reduced to one of its defining characteristics. Further, a same process can serve different functions. For instance, the process of disengaging attention from threatening stimuli might serve the function of escaping from threat, but it might also serve the function of allocating resources to the ongoing task, or to perceive the full picture of the situation. Hence, while the concepts of process and function are very close, they need to be distinguished.



## **A classification of psychopathological processes**

Another important issue for the process-based approach is the classification of psychological processes in psychopathology. The flurry of research conducted in psychopathology has evidenced dozens of processes, some of them defined at a very specific level (for instance, the attentional disengagement deficit in anxiety [Heeren, De Raedt, Koster, & Philippot, 2013]), while others encompass more general notions (for instance, the hypothesis that experiential avoidance would sustain most of psychopathology [Barlow, Allen, & Choate, 2004 ; Hayes, Follette, & Linehan, 2004]). Hence, beyond the great diversity of processes, the issue of the level of specificity to which psychopathological processes must be considered is also raised and will be discussed in a following section.

Harvey and collaborators (2004) have proposed a classification of transdiagnostic processes, i.e. the cognitive and behavioral processes that are active in several psychological disorders. Their classification is based on mental functions in the domains of attention (selective attention and attentional avoidance), memory (selective memory, recurrent memories, and overgeneral memory), reasoning (interpretation bias, expectation bias and emotional reasoning), thoughts (recurrent negative thinking, metacognition, and thought suppression), and behavior (avoidance and security behaviors). These authors later acknowledged the possibility of including emotional reactions, such as shame, or interpersonal relationships, such as dominance-submission as transdiagnostic processes (Mansell, Harvey, Watkins, & Shafran, 2008).

The classification of Harvey and collaborators (2004) has the advantage of organizing the extensive literature on cognitive psychopathology, and to specify the underlying processes at an intermediate level of specificity. However, it is essentially descriptive and it does not reflect the function served by these processes in psychological disorders. As proposed here, a “process” is foremost defined by its transformative function, and not by the formal aspect of the behavior. Indeed, a similar behavior might serve different functions, and hence reflect different processes. For instance, focusing attention on the sensation of breathing might be an avoidance process in trauma survivors who attempt to distract themselves from cues that remind them of the trauma, while the same behavior might be an experiential confrontation for individuals suffering from panic attack and body-sensation

phobia, as it focuses their attention on bodily sensations, the trigger of their panic attacks. Hence, to be clinically meaningful, a classification of processes must take into account the functions served by the observed phenomena. But foremost, the classification proposed by Harvey and collaborators is almost exclusively centered on cognitive factors. It gives little attention to motivational, emotional, interpersonal, and for a large part, developmental aspects. In sum, this classification is certainly useful to structure the literature in cognitive psychopathology, but it might be too restrictive, and not functionalist enough, to be fully useful for clinical purposes, such as case conceptualization.

To overcome some of these limitations, we propose a tri-dimensional classification of psychopathological processes. The first dimension pertains to the psychological domain in which the process is nested, the second dimension pertains to the specificity with which the process is conceptualized, and the third dimension pertains to whether the process is intrapersonal or interpersonal. This classification is depicted in Figure 1 and the dimensions are defined in Table 1.

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Insert about here Table 1 & Figure 1.

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### **The psychological domains**

The first dimension addresses the psychological domain to which the process belongs. It is akin to the categorization proposed by Harvey et al. (2004), but distinguishes itself from it on two aspects. First, rather than being based on the broad domains defined by cognitive psychology, the present categories are based on the domains covered by psychopathology. Second, the domains considered are not limited to cognitive and behavioral aspects. Rather, it considers four categories that we will briefly outline: motivation, emotion, cognition and behavior.

In clinical psychology, motivational processes have mainly been considered in the context of difficulties in acknowledging a psychological problem, or in initiating and maintaining a change to alleviate the problem. A motivational continuum has been proposed, ranging from amotivation (absence of motivation), proceeding through extrinsic motivation (motivation determined by factors external to the individual) to intrinsic motivation (the motivation is then determined by factors internal to the individual) (Ryan & Deci, 2000). Motivation processes are central to initiating a procedure of change and for maintaining it until a target is reached. Prochaska and DiClemente (1984)

have proposed a transtheoretical model of motivation for change that is widely applied in clinical interventions, for instance in the treatment of addiction (Nidecker, DiClemente, Bennett, & Bellack, 2008). Based on this model, Miller and Rollnick (2013) have developed the motivational interview, a set of psychological interventions validated for motivating people to change in psychotherapy (Lundahl, Brownell, Tollefson, & Burke, 2010).

The second category of classification is emotion processes. This has recently become the focus of attention with the development of the so-called third wave of cognitive and behavior therapies, although several authors had already insisted, decades ago, on their central role in psychopathology (e.g., Barlow, 1988; Greenberg & Paivio, 1997). Of special clinical relevance are the processes underlying emotional appraisal, emotional responses, and emotion regulation. Emotional appraisal processes confer an emotional meaning to a situation, on the basis of the perceived relevance of the situation for the goals, values, or roles of an individual and of their coping potential in that situation. Obviously, these processes might be explicit or implicit (Scherer, 2001), and the individual might not necessarily be conscious of the emotional meaning they ascribe to the situation. Multi-level models of emotion, distinguishing between different appraisal processes, are central for the understanding of many emotional disorders (Dalgleish, 2004; Power & Dalgleish, 2008). Emotional responses comprise expressive processes (for instance, posture, prosody, or facial expressions), action tendencies, and physiological responses that arise during emotion. A detailed review of these processes and of their clinical implication can be found in Power (2010) or Philippot (2011). Finally, research has evidenced dysfunctions in the regulation of emotion in most psychological disorders (for a review, see Ehring, 2013). A range of emotional therapies has been developed in the last two decades to target these problems (Crowell, Beauchaine, & Linehan, 2009; Greenberg, 2002; Hayes, Strosahl, & Wilson, 2012; Monestès & Villatte, 2011; Philippot, 2011).

The third category of classification, cognitive processes, might be the most studied category in experimental psychopathology. In this general category, one can distinguish between non-reflective processes and reflective processes. Non-reflective cognitive processes, as proposed by Harvey et al. (2004), encompass several sub-domains such as attention and executive processes (Peschard & Philippot, 2016), memory (overgeneral memory, selective memory, intrusive memory) (van

Vreeswijk & de Wilde, 2004), judgment (interpretation, expectation, reasoning) (Wells, 2008), and thinking (repetitive thinking, thought suppression) (Watkins, 2008). In all these aspects of cognition, biases or deficits have been demonstrated across several psychopathological conditions. Furthermore, experimental research has convincingly documented that many of these processes play a causal role in the onset and maintenance of certain psychopathological conditions (e.g. Heeren, Peschard, & Philippot, 2012). At a more fundamental level, an inhibitory deficit seems to be present in many psychopathological conditions, which can be generalized (Billieux, Gay, Rochat, & Van der Linden, 2010), or limited to a specific situation. Such fundamental deficits might generate a succession of deficits and biases in more complex processes that depend upon inhibition, such as attentional control (Heeren, Billieux, Philippot, & Maurage, 2015). Biased attention determines which information is attended to and processed, which in turn determines the information available for consolidating in memory, and for elaborating a judgement. Indeed, poorly attended information has little chance to be taken into consideration for judgment, or to be transferred into long-term memory. This concept of a hierarchy in cognitive deficits and biases that could produce a snowball effect is also reflected in the idea of combined cognitive biases developed by Hirsch & Mathews (2012).

Regarding treatment, an extensive literature has investigated the efficacy of retraining non-reflective cognitive processes when they become dysfunctional. This includes attentional retraining (Heeren, Mogoase, McNally, Schmitz, & Philippot, 2015), training individuals to think in an experiential and concrete mode (Watkins, Baeyens, & Read, 2009), or cognitively restructuring judgment errors (Beck & Clark, 1997).

Like non-reflective processes, reflective processes also cover a large range of psychological phenomena. These processes are often labelled “metacognitive processes”, and can be divided into three types. The first type concerns the representations, judgements, and beliefs people hold about their cognitive processes, such as their thinking, memory, and perception. For instance, some people believe that excessive worrying might eventually turn someone crazy; in contrast, others believe that worrying might help to prevent catastrophes. Such beliefs have been shown to encourage people to worry when confronted with adverse situations (Wells, 1995). Wells’ (2009) metacognitive therapy of

anxiety and depression is an intervention that specifically targets such maladaptive thoughts that people may have about their cognitive processes.

The second type of metacognitive processes refers to judgments about the self. It encompasses self-esteem (the evaluation and associated feeling that one has about his/her own value) and the feeling of self-efficacy (the evaluation and associated feeling one has about his/her capacity to act and to modify the contingencies that are impacting on him/her) (Bandura, 1997). There are three main dimensions along which people formulate judgments about themselves and others: physical appearance, skills (intelligence, performance, etc.), and likeability (McGarty, Yzerbyt, & Spears, 2002). There is a long tradition of cognitive and behavioral interventions targeting judgements about the self (e.g., Fennell, 1998).

The third type of metacognitive processes refers to self-representations. Higgins (1987) distinguishes between three self-representations that are clinically relevant: the actual self (the representation each person has of him or herself, in his/her present state of accomplishment), the ideal self (the representation of how the person dreams to ideally be), and the socially prescribed or “ought” self (the representation that each person has of who his or her significant others wish he or she would be). Perceived discrepancies between the actual self and the ideal or the socially prescribed selves generate emotions that can be motivating if the discrepancy is perceived as a feasible challenge, or distressing if the gap is seen as unacceptable or difficult to overcome. For instance, depression is characterized by a gap between the actual and ideal selves; shame is caused by a gap between the actual and socially prescribed selves (Higgins, Bond, Klein, & Strauman, 1986).

Reflective processes heavily dwell on representations (i.e. cognitive content) and feelings, raising the question of the distinction between processes and their outcomes. Some have even argued that processes are merely activated representations, at least for “passive” processes (Heald & Nusbaum, 2014). In our view, a process implies a transformation of these representations or feelings and thus cannot be equated to their activation. It further requires elaboration and/or transformation with, i.e. directed attention, judgment, and regulation (Leary & Tangney, 2012).

The last category, behavioral processes, encompasses all overt behaviors performed by the individual. There is a long tradition of understanding psychopathology from the perspective of learning theories and behavior conditioning. It has been shown that many learned behaviors are implicated in the onset and in the maintenance of mental disorders (Vervliet, Craske, & Hermans, 2013). Overt behaviors are also accounted for by motivation theories (Elliot & Dweck, 2005; Ryan & Deci, 2000), cognitive dissonance theory (Festinger, 1957), and personality theories. This wealth of knowledge has led to a diversity of robustly validated interventions (for example, see the application of inhibitory learning processes to the treatment of anxiety disorders: Craske et al., 2014).

Evidently, the different categories of motivation, emotion, cognition, and behavior overlap. This classification is descriptive and artificially distinguishes between phenomena that permanently interact with each other. For instance, it is well established that deficits in attentional control processes (cognitive domain) negatively impact on emotion regulation (emotion domain) (Ehring, 2013; Peschard & Philippot, 2016), for instance, in the maintenance of depressive mood and depressogenic repetitive thoughts (Dalgleish, Williams, Golden, et al., 2007).

### **The specificity at which the process is considered**

The second dimension addresses the level of specificity at which the process is conceptualized. We can illustrate it with the case of rumination and the three levels of process specificity related to repetitive thoughts (Ehring & Watkins, 2008). The construct of mental rumination in itself is broad and represents a superordinate level of conceptualization. At a more specific level, the work of Watkins (2008) has shown that pathological rumination stems from an abstract and analytical cognitive style: The individual wonders about the causes and consequences of his/her state in an abstract way (for example: “why don’t I have the stamina to get out of my depression?” or “what will happen if I continue to feel so bad, will I be able to keep my job?”). This cognitive style can also be considered as a process. In this case, the level of analysis is more specific. An even more specific level can further be used. Indeed, rumination is characterized by a deficit in cognitive flexibility, i.e. difficulty in disengaging attention from a prepotent response (ruminative thoughts occur automatically) and in re-engaging attention on an ongoing task or action (Heeren & Philippot, 2011).

In sum, rumination can be conceptualized at a superordinate level as “mental rumination”, at an intermediate level as an abstract and analytical cognitive style, and at a subordinate level, as a deficit in cognitive flexibility. From a clinical perspective, the superordinate level might be too abstract to suggest concrete and specific interventions, which, in contrast, are allowed by the intermediate and subordinate levels. The decision of the appropriate level of process conceptualization is thus a strategic and functional decision that depends upon the aims of the clinician, and the feasibility of targeting an intervention to a specific level (for instance, in a given clinical setting, is it possible to train cognitive flexibility in such a way as to alleviate mental rumination?).

At least three criteria should be considered to determine the optimal specificity level at which a process should be examined. First, the process must be observable in a clinical context, either directly by the client, or by a relative or therapist, using direct (observation, interview) or indirect (questionnaires, tests, etc.) means. Second, the process must be sufficiently concrete to be the object of an intervention. In other words, it must be operationalizable in the clinical context where the intervention takes place. The more operationalized the process is, the greater the chance that a concrete intervention can be derived, and the more reliably the induced changes can be evaluated. For instance, some very specific processes, such as automatic early attentional biases for threatening information in anxiety disorders, are difficult to evaluate in an ambulatory clinical setting, at an individual level. Hence, presently, they might not reflect an optimal level for clinical conceptualization, although they have been proven useful from a research perspective. Finally, the level of specificity must be tuned to the particular characteristics of the case. Indeed, in some cases, the disorder might be maintained by a very specific process (for instance, classical conditioning towards a very specific object in a simple phobia), while in other cases, the disorder is maintained by a broad class of processes (for instance, experiential avoidance in generalized anxiety disorder). In sum, how the optimal level of specificity is determined rests upon a clinical judgment from a functionalist approach, based on the characteristics of the clinical situation and on the available resources, for the client as well as for the therapist.



### **Distinction between inter and intra-personal processes**

The last dimension concerns the intra- versus interpersonal nature of the processes. Intra-personal processes concern the management of the individual themselves, interpersonal processes concern the management of interpersonal relationships. It should be noted that only psychological processes are considered here, belonging to one of the four categories mentioned in the first dimension. It encompasses motivational, emotional, cognitive, and behavioral processes implicated in interpersonal relationships. Examples are affiliation motivation, emotional contagion, collective memory, social representations and stereotypes, or dominance behaviors. Other interpersonal processes that are not considered here include social processes (like anomie; Deflem, 1989) or group dynamic processes (Aronson, 2008).

This dimension underlines the importance of the too often neglected interpersonal factors in psychopathology. As particularly evidenced by interpersonal, family and couple therapies, the interpersonal processes are often active in individual mental disorders, beyond family or couple dynamics. For instance, processes influencing the perception and enforcement of social dominance and affiliation (two prototypical examples of interpersonal processes) seem to be central in the onset and maintenance of social anxiety (Gilboa-Schechtman, Friedman, Helpman, & Kananov, 2013). Likewise, there is an extensive literature on dysfunctional attachment in psychopathology (Mikulincer & Shaver, 2012). As a gregarious species, humans cannot survive outside a tight-knit group. The most fundamental human fear is ostracism, that is, being rejected by one's group (Croston, 2012). Our identity, the roles we invest in, depend upon how others perceive us (Bem, 1972).

In the present contribution, we will focus on intra-personal processes, not because interpersonal processes would be less important, but rather because the literature has been much more developed for intrapersonal processes, especially regarding their measurement. The interested clinician will find clinically useful instruments for the measure of attachment (Collins & Read, 1990) and dominance (Hamby, 1996; for a more general discussion of the different ways of assessing dominance, see Johnson, Leedom, & Muhtadie, 2012). Another important process is social support. The Significant Other Scale (Power, 2010) is a clinically relevant instrument that assesses the diversity and quality of social support in an idiographic perspective.



### **Basing treatment choice on processes**

Among these many processes, how can the clinician choose the specific processes that should be targeted by the intervention? Several principles should be taken into account.

The first principle is that, to be selected for intervention, a process must be a key determinant of the psychological problem(s) that both client and therapist have agreed to address. This is determined through a case formulation based on the functional analysis principles developed by Viruès-Ortega and Haynes (2005). This will be detailed in a next section describing a protocol to evaluate psychological processes in mood and anxiety disorders. Briefly, this case formulation aims at giving an account of the psychological functioning of the client by articulating eliciting conditions, psychological processes, symptoms, and their functional consequences. Hence, in this perspective, the intensity of symptoms and the importance of their consequences are necessarily taken into account.

A second principle is that a careful evaluation of the processes involved in a given case should be performed with validated instruments, and information from different sources (including idiographic data). In a following section, we present a set of validated instruments aimed at evaluating processes that may be implicated in mood and anxiety disorders.

Third, when choosing specific process to target for an intervention, one should look to the extensive literature that has developed in psychopathology in the last decades. Theoretical models have been elaborated and validated for many disorders and psychopathological phenomena. Their underlying processes have been identified, and in some cases, the causal role of such processes has been established. For example, validated models identifying specific processes have been developed for specific disorders (e.g., the models of Borkovec (2002) or Ladouceur (Dugas, Buhr, & Ladouceur, 2004) for General Anxiety Disorder) and other types of psychological problems (for instance, perfectionism, modeled by Shafran, Egan, and Wade (2010)). Furthermore, this literature specifies the optimal level at which the processes should be considered in order to best explain, and intervene in, the disorders.

The fourth factor to consider when designing an intervention is the clinical practicability. Some processes (for instance, behavioral avoidance) can be more easily targeted by a psychological intervention than others (for instance, automatic attentional biases towards threat). Indeed, some processes, especially implicit ones, can only be demonstrated and modified with elaborate protocols. For instance, demonstrating attentional biases requires computer-generated tasks with a very precise measurement and analysis of response times. Similarly, modifying such biases necessitates elaborated computer programs. Such technology is not always available to the field clinician.

The fifth factor takes into account the clinician's expertise. The field of psychopathological processes is vast and rapidly expanding. No clinician can claim to master evaluation and intervention procedures for all psychopathological processes. It is therefore unavoidable that the clinician favors working on processes he or she masters, providing that they are relevant to the case in question.

Finally, the client's preferences must be taken into account. Indeed, some clients may express a specific interest to work on a given psychological phenomena, or present an affinity with certain types of intervention. Again, providing that these preferences can be applied to the processes evidenced in the case conceptualization, they should be taken into consideration.

These six principles guide the clinician's choice in the identification and selection of the target processes and of the level of specificity at which they should be considered. Still, this practice is more art than the strict application of well-defined procedures. This approach requires that practitioners have in-depth training regarding psychopathological models and their derived interventions, as well as continuous education to remain up-to-date with the fast-growing body of knowledge in psychopathology.

### **A modular, process-based approach to psychological treatment**

Integrating a process-based approach to case conceptualization has implications for treatment design. Indeed, in most cases, several psychopathological processes are active and thus constitute potential targets for treatment. The basic rationale we propose is that treatment protocols should target processes. More specifically, for each psychopathological process, there should be a corresponding

validated treatment module. In this perspective, a client would be proposed a treatment that links the modules corresponding to the processes targeted in his or her case conceptualization.

This approach has the merits of adapting the treatment to the individual characteristics of each case, while preserving the concern that interventions should be evidence-based. This consideration is particularly important in the broader context of the literature on treatment individualization (Schulte, 1996), which is based on a functional of each case. The clinician attempts to identify the main etiopathological factors for treatment. However, the identification of these factors and the selection of the corresponding intervention are largely left to the clinician's intuition. Earlier research (e.g. Schulte, 1996; Schulte, Kunzel, Pepping, & Schulte-Bahrenberg, 1992) did counter-intuitively observe no differences between individualized and standard treatments, while more recent research (e.g. Ghaderi, 2006) documented some benefits to individualization, although the effect sizes were modest. Clearly, there is room for improvement in treatment individualization and modularity offers a promising prospect.

From a modular, process-based perspective, the empirical validation of the treatment is firstly based on the question: Does this intervention module favorably modify this specific psychopathological process? For instance, does a given intervention module effectively diminish abstract evaluative repetitive thinking, while promoting concrete experiential thinking? Or, does another intervention module effectively reduce attentional biases? The global validation of such a treatment thus rests on three main questions: (a) the validity of the procedure to identify target-processes in the case conceptualization, (b) the validity of each treatment module to effectively modify its target psychopathological process, and (c) the validity of the whole procedure to effectively alleviate symptoms and distress.

Some empirical evidence suggests that a modular approach to psychological treatment might be more effective than the classic approach of a treatment package validated for a given diagnosis. Recently, Chorpita and collaborators (2013) designed a modular treatment for mood and anxiety disorders in children. This treatment comprises 31 modules, each addressing a specific problem (e.g. "learning to relax" or "psychoeducation about anxiety"). In a multi-centric randomized controlled trial on 174 children, Chorpita et al. (2013) compared their modular treatment (modular condition) to a

condition in which the validated treatment for the main diagnosis was applied (standard condition), and to a condition in which the clinician applied the treatment that he/she intuitively thought to be the best (Treatment as usual [TAU] condition). The results revealed that two years after treatment, symptoms in the modular condition were significantly reduced compared to the TAU condition, and marginally reduced compared to the standard condition, which in turn did not differ from the TAU condition. In sum, a modular process-based approach to psychological treatment is not only logically appealing, but is also supported by preliminary evidence.

### **A protocol to evaluate psychological processes in mood and anxiety disorders**

As a concrete example of the implementation of these principles, we have recently endeavored to design a modular process-based protocol for the treatment of mood and anxiety disorders in adults. Its general rationale comprises several steps. First, a case conceptualization module is needed to identify the psychopathological processes that are active in a given client. Second, this case conceptualization module is followed by a psycho-education module in which the treatment rationale is explained to the client, an explanation of the case conceptualization is presented, and general information is provided about depression, anxiety and functional and dysfunctional emotion regulation strategies. Third, a set of treatment modules should be designed, each addressing a specific process identified in the literature as being potentially active in mood and anxiety disorders. Finally, a general module of relapse prevention would close the treatment.

We propose to base the case conceptualization of the first module on the transdiagnostic case conceptualization framework proposed by Dudley, Kuyken and Padesky (2011), and on the functional analysis principles developed by Viruès-Ortega and Haynes (2005). In this conception, individual cases are modeled in an integrated set of functional relations. Specifically, causal relations are hypothesized between eliciting conditions, psychological processes, symptoms, and functional consequences. These relationships imply covariance, theoretically founded connection and temporal precedence of the causal factor and well as the exclusion of third variables. These functional relations can be of a uni- or bi-directional, or a moderating or mediating nature. Within this framework, psychological processes are conceived of as causal functional variables.

In this perspective, we identified processes for which there was good empirical evidence from the literature supporting their role in mood and anxiety disorders. Specifically, we first identified psychological treatments of mood and anxiety disorders for which there is good evidence of efficacy according to APA standards (Foa & Meadows, 1997). Then, we identified the etiopathological processes targeted by these treatments and, if the treatment was explicitly based on an etiopathological model, we focused on the key processes mentioned in the model and extracted those that were most commonly mentioned.

We aimed at a measurement instrument that would be both validated, at least at the psychometric level, and that could be easily used in the everyday context of ambulatory psychotherapy. Given their dynamic nature, processes should be ideally assessed with dynamic instruments, capturing moment-to-moment changes and covariations. Attempts in this direction have been proposed with the development of the event sampling procedure and sophisticated statistical methods combining multilevel regression and confirmatory factor analysis (Fischer, 2015; Mumma, 2011). However, this experimental approach is impractical in ambulatory settings because it requires intensive data collection (at least 7 data points a day for at least a week) and high-level statistical knowledge (few clinicians know about multilevel regression and confirmatory factor analysis). 7

Given these constraints, we choose to rely on the more classic method of using questionnaires, taking care to select instruments that could be used repeatedly, in order to capture temporal changes in outcomes. We identified tests and questionnaires measuring the identified processes, and which were validated in English or French. For some processes we did not find such instruments. In these few cases, we ourselves attempted to design and validate such instruments. In other cases, the instruments were well-validated in English but insufficiently validated in French (when the original work was conducted in English). We then validated these instruments in French.

This approach bears limitations inherent to questionnaires. Questionnaires depend upon the limited introspection and awareness capacities of the clients (i.e. can the psychological process be consciously perceived--directly or indirectly through its outcome--and reported?). They may be biased by social desirability, compliance, etc. The questionnaire set we present here should thus be considered as one source of information that should be cross-checked with other sources (direct or

indirect observations, interviews, role playing, etc.). When the target processes are implicit and/or automatic, they are less directly available to introspection. Most often, they have to be inferred through their outcomes. There are laboratory tasks that have been designed to assess these processes (e.g. implicit attitude, attentional biases). However, these tasks have very poor psychometric properties in term of convergent validity and test-retest reliability (Kappenman, Farrens, Luck, & Hajcak Proudfit, 2014). They may yield useful information for research addressing groups of participants. However, in clinical settings, targeting single individuals, not only are they impractical to implement, but foremost, the information they yield is not psychometrically reliable. Hence, for some processes (i.e. attentional biases), we could not identify from the literature a valid procedure to assess them at the individual level, in ambulatory settings. We thus had to omit these processes from our measurement instrument.

In the following sections, we present the psychopathological processes we identified as central for mood and anxiety disorders in adults. We then describe the measurement instruments selected for each process. The questionnaires chosen can be filled in by clients in French or in English on an Internet server. An analysis tool then automatically computes the scores of the scales and sub-scales of each questionnaire. It also compares each score of the client with its distribution in the general population, allowing the clinician to determine whether the process indexed by the score is abnormally (too high or too low intensity) presented in that client. Furthermore, the tool also allows measurements of the same score at two different time points to be compared, and to determine whether a score change is clinically significant, using the Reliable Change Index (RCI; Jacobson & Truax, 1991). Access to the server and the analysis tool can be obtained from the following website: [uclep.be/process](http://uclep.be/process).

### **Avoidance and behavioral deactivation**

Experiential avoidance has been proposed as a core process involved in most clinical disorders. When confronted with a difficult or threatening emotion, people can interpret it in one of two ways. Either this emotion is perceived as extremely painful and potentially intolerable or this negative emotion is perceived as unpleasant but tolerable. In the first case, the individual will attempt

to suppress or avoid the emotion by avoiding situations susceptible to trigger the emotion, ignoring or denying their feelings, trying to suppress their anxiety by taking drugs, and/or by distracting themselves, etc.

Avoidance can be an effective strategy, at least in the short-term, when it applies to avoiding external triggers. A dog phobic, for example, can avoid dogs. But this strategy is ineffective when one attempts to avoid emotional feelings, as they are internal states and, as such, cannot be avoided. Avoiding emotions does not cause them to disappear. Rather, since the emotional avoidance impairs emotional information processing, the problematic situation is likely to continue, as well as the associated emotion. According to Barlow (Barlow et al., 2004), a vicious cycle is then initiated: The avoided emotion is maintained, the individual feels increasingly powerless in the situation, enhancing the distress prompted by emotion. This vicious cycle can result in emotional disorders, such as anxiety or depression.

Emotional avoidance can also lead the individual to disengage from activities reflecting his goals, values and roles. This disengagement leads to behavioral deactivation by the loss of meaningful and reinforcing activities. This deactivation results in a loss of positive affect and mood deterioration, and is considered to be a central process in depression (Hopko et al., 2003). Moreover, behavioral disengagement often deprives the individual of activities that are protective against stress (such as physical exercise), and which provide social support (such as socializing).

Avoidance can be measured by the Multidimensional Experiential Avoidance Questionnaire (MEAQ; Gámez, Chmielewski, Ruggero, Kotov, & Watson, 2011). The MEAQ is a 62-item questionnaire assessing avoidance through six subscales: behavioral avoidance, procrastination, distraction/suppression, repression/denial, distress aversion (i.e., nonacceptance of or negative attitudes toward distress), and distress endurance (i.e., willingness to engage in behavior that is consistent with one's values even in situations of distress). Each item is rated on a 6-point scale ranging from 1 (strongly disagree) to 6 (strongly agree). The subscales show evidence of good internal consistency (ranging from .79 to .90). Moreover, the MEAQ has been found to have good convergent and divergent validity (Gámez et al., 2011). The validation of the French version of the MEAQ is in progress.

### **Intolerance of uncertainty scale**

Intolerance of uncertainty is defined as the tendency to react negatively on a cognitive, behavioral, and emotional level to uncertain or ambiguous situations (Dugas et al., 2004). It is the overall tendency of an individual to find unacceptable that a negative event might occur, however small that probability (Buhr & Dugas, 2002). Ladouceur et al. (1999) have identified intolerance of uncertainty as a key cognitive process in Generalized Anxiety Disorder. Intolerance of uncertainty is also observed in obsessions and compulsions. Some obsessive compulsive patients show pathological doubt about the security of a situation or action. They find uncertainty itself to be highly distressing and have compulsions until they are certain that all is secure (Tolin, Abramowitz, Brigidi, & Foa, 2003, p. 234). Intolerance to uncertainty is a risk factor for the development and maintenance of mood and anxiety disorders.

Freeston, Rhéaume, Letarte, Dugas and Ladouceur (1994) have developed a questionnaire measuring intolerance of uncertainty. It consists of 27 items about uncertainty, emotional and behavioral reactions to ambiguous situations, implications of being uncertain, and attempts to control the future. Participants rate items on a five-point scale ranging from 1 (not at all characteristic of me) to 5 (entirely characteristic of me). The French version of the questionnaire possess good test retest reliability (Dugas, Freeston, & Ladouceur, 1997) and excellent internal consistency. It has shown good criterion-related validity in distinguishing patients with GAD from those with other anxiety disorders (Ladouceur et al., 1999). The psychometric properties of the English version of the questionnaire was studied by Buhr and Dugas (2002) and Sexton and Dugas (2009).

### **Rumination**

Rumination was initially studied in the context of depression. According to the response styles theory (Nolen-Hoeksema, 1991), rumination is a mode of responding to distress characterized by repetitive and passive thoughts focusing on depressive symptoms, their causes (e.g., why am I depressed?), consequences and implications (e.g., “What’s going to happen if I cannot cope?”).



Although research has highlighted the role of rumination in the development and maintenance of depression (for a review, see Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008), mental ruminations are currently considered a transdiagnostic process involved in many disorders such as depressive disorders, anxiety disorders, eating disorders, or disorders related to abuse and substance dependence (e.g., Ehring & Watkins, 2008).

According to the processing-mode theory of rumination (Watkins, 2004, 2008, 2011), one might distinguish between two modes of ruminations, one concrete-experiential, the other one abstract-analytical. In the concrete-experiential mode, thoughts are focused on the present moment and how things unfold moment-by-moment, taking into account emotions, physiological and bodily sensations as well as the specific context of the situation. In the abstract-analytical mode, thoughts are focused on analyzing the causes, meanings and consequences of an emotional state or situation. Instead of focusing on the present moment, thoughts are past- and future- oriented. Importantly, the distinction between a concrete-experiential and an abstract-analytical mode has allowed the development of interventions specifically focusing on decreasing the abstract mode of thinking and increasing a concrete mode of thinking (e.g., Watkins, 2015).

The Mini-CERTS (Mini Cambridge Exeter Repetitive Thoughts Scale; Douilliez et al., 2014) is a 15-item self-report questionnaire assessing mental rumination. Rumination is defined as repetitive, recurrent and prolonged thoughts about oneself, feelings, situations and events. The questionnaire enables the discrimination and assessment of the two modes of rumination, concrete-experiential vs. abstract-analytical. The mini-CERTS is a short version of the CERTS (Barnard, Watkins, Mackintosh, & Nimmo-Smith, 2007) and has been validated in French by Douilliez et al. (2014). It has shown acceptable to good internal consistency (Douilliez et al., 2014) as well as sensitivity to the effects of treatment (Heeren & Philippot, 2011).

## Metacognitive beliefs

Metacognition refers both to the knowledge or beliefs and to the processes involved in the evaluation of thoughts and the monitoring and control of cognition (Harvey et al., 2004). For example, a client may believe that not controlling his own thoughts may have disastrous consequences for himself such as driving him mad. Alternatively, a patient may believe that worrying allows him to better manage his daily activities. Wells and Matthews (1996) consider metacognition to be an important factor in the development of psychological disorders (Wells, 2000). Metacognitive factors are associated with various psychological disorders, including generalized anxiety disorder (Davis & Valentiner, 2000; Wells & Carter, 1999), obsessive-compulsive disorder (Emmelkamp & Aardema, 1999; Janeck, Calamari, Riemann, & Heffelfinger, 2003; Wells & Papageorgiou, 1998), post-traumatic stress disorder (Holeva, Tarrier, & Wells, 2001; Reynolds & Wells, 1999), hypochondriasis (Bouman & Meijer, 1999), depression (Papageorgiou & Wells, 2003), and schizophrenia (Lobban, Haddock, Kinderman, & Wells, 2002).

The short form of the Metacognitions Questionnaire (MCQ-30) is a 30-item scale that measures metacognitive beliefs as well as cognitive confidence. This scale was created in order to assess the factors postulated in Wells' (1995) metacognitive model of worry. The initial version of MCQ (Cartwright-Hatton & Wells, 1997) comprised of 65 items. Exploratory factor analyses suggested a five-factor structure: (1) *Positive Beliefs about Worry* (worries confer benefits such as being more efficient, avoiding problems that may occur and improving adaptation), (2) *Negative Beliefs about the Uncontrollability of Thoughts and Corresponding Danger* (worries may represent a threat, drive oneself mad, and be completely uncontrollable), (3) *Superstition, Punishment and Responsibility* (having certain thoughts is bad and it is one's responsibility to control them and not doing so is punishable), (4) *Beliefs about Cognitive Confidence* (a lack of confidence in one's own memory capabilities), (5) *Cognitive Self-Consciousness* (a tendency to focus on and to monitor the thinking process). A short version of the MCQ with similar properties and structure has been proposed by Wells and Cartwright-Hatton (2004).

## **Helplessness and poor self-efficacy**

Helplessness involves feeling unable to influence the outcome of one's own actions (Peterson, Maier, & Seligman, 1993). On the contrary, perceived self-efficacy refers to an individual's belief in their ability to attain a particular goal (Bandura, 1997). This notion stems from the socio-cognitive theory of Bandura (1977) stating that self-efficacy determines the initiation of, the effort devoted to, and the maintenance of coping strategies. Self-efficacy may originate from four sources of information: past experiences, vicarious learning, verbal persuasion, and psychological states. In this view, the main aim of therapy is to facilitate the development of abilities and knowledge in order to help patients to develop greater control over their thoughts, behaviors, emotional states as well as the course of their life (Bandura, 1997). On the one hand, as beliefs and feelings, helplessness and self-efficacy are more the outcomes of processes than processes per se. On the other hand, they may also determine other processes, for instance, helplessness might foster behavioral avoidance. Still, as the processes generating helplessness and self-efficacy are not easily captured through questionnaires, there is a clear clinical interest in measuring these outcomes in order to infer underlying processes (for a detailed discussion of this issue in a related domain, see Mant (2001)).

The role of self-efficacy has been evidenced in specific phobias as well as in traumatic experiences (Bandura, 1983, 1997). Its role in other psychological disorders still remains to be evaluated. Conversely, helplessness has been shown to play a key role in the onset and maintenance of depleted mood (Peterson et al., 1993)

The Self-Efficacy Questionnaire was created by our team, in accordance with the recommendations of Bandura (2006). It is composed of 10 items covering various life domains such as affective life, family, hobbies, etc. Participants evaluate the level of confidence in their ability to handle each domain on a scale from 0 to 100. The main advantage of this questionnaire is the identification of the life domains in which self-efficacy is particularly weak or high. In regard to clinical intervention, it may suggest that the therapist should focus that relying on high self-efficacy domains, as well as helping the client to restore self-efficacy in domains in which it is low, for example, by establish active mastery experiences.

## **Self-Discrepancy Scale**

The Self-Discrepancy Scale (S-DS) is a measure for evaluating self-discrepancies (Philippot, Dethier, Baeyens, & Bouvard, 2017) and more globally self-representations, inspired by the Integrated Self-discrepancy Index (Hardin & Lakin, 2009). The questionnaire requires participants to first generate a list of characteristics (max: 8) that they ideally wish to have, then a list of characteristics (max: 8) that they ideally wish not to have. For each characteristic, participant estimate the extent to which they possess this attribute (from 0% to 100%). These percentages are used as indexes of the discrepancies between the actual self and the ideal or personally unwanted self. Next, participants are asked to estimate (a) the perceived gap between their ideal and actual selves and (b) the distress caused by the discrepancy on two Likert scales from 0 to 10. This procedure is then repeated for the socially prescribed self. Hence, this questionnaire generates four scores of discrepancies (between actual self and (a) ideal, (b) personally-unwanted, (c) socially prescribed, and (d) socially unwanted selves) as well as overall subjective judgments of discrepancies between actual self and ideal and socially prescribed selves, and about the distress resulting from these discrepancies. The psychometric validation of this scale is described in Philippot et al. (2017).

Self-discrepancies, and more generally self-judgments, have a long history as key processes in psychopathology. Rogers (1951) had already pointed to the discrepancy between real and ideal selves as a major source of emotional distress. The validation studies of the S-DS (Philippot et al., 2017) also report specific patterns of discrepancies in clinical populations. Specifically, depressed patients are better characterized by large discrepancies with the ideal self and endorsement of personally unwanted traits, while anxious patients were no different from controls regarding the endorsement of desired and undesired traits. Further, recent evidences show that self-discrepancies predict craving and alcohol intake in alcoholic patients (Poncin, Dethier, Philippot, Vermeulen, & de Timary, 2015).

## **Impulsivity**

Impulsivity is one of the more common diagnostic criteria in nosography manuals such as the DSM (Billieux, Rochat, & Van der Linden, 2014). A wealth of studies has established the multifaceted nature of impulsivity, which comprises four dimensions (Whiteside & Lynam, 2001): (1) urgency, the tendency to act rashly under conditions of negative affect, (2) lack of premeditation, the difficulty in thinking about and reflecting on the consequences of an act before engaging in that act, (3) lack of perseverance, the inability to remain focused on tedious or difficult tasks, and (4) sensation seeking, the tendency to enjoy and pursue exciting activities and the openness to try new experiences that may be dangerous. These impulsivity components have been linked to specific cognitive mechanisms (e.g., deficits in specific executive functions) and motivational factors (e.g., variations in sensitivity to reinforcement) (Bechara & Van der Linden, 2005; Gay, Rochat, Billieux, d'Acremont, & Van der Linden, 2008).

Recent research has shown clear links between specific impulsivity facets and psychological disorders related to anxiety, depression, hyperactivity, eating disorders, and addiction (for a review, see Moeller, Barratt, Dougherty, Schmitz, & Swann, 2001). Regarding depression, several studies have demonstrated a relationship between depressive symptoms on the one hand, and the urgency and lack of perseverance facets of impulsivity on the other hand (e.g. Anestis, Selby, & Joiner, 2007; d'Acremont & Van der Linden, 2007). Interestingly, Schmidt and collaborators (Schmidt, Gay, Ghisletta, & Van der Linden, 2010; Schmidt, Gay, & Van der Linden, 2008; Schmidt & Van der Linden, 2009) have shown that the same two facets are also involved in insomnia, a frequent phenomenon in mood and anxiety disorders. Furthermore, a longitudinal study (Smith, Guller, & Zapolski, 2013) has shown that not only is the urgency dimension related to depression, but that it also predicts increased depressive symptoms one year later. Regarding anxiety, several studies have established a relationship between worry and urgency, lack of perseverance and lack of premeditation (Gay, Schmidt, & Van der Linden, 2011; Pawluk & Koerner, 2013). Miller, Flory, Lynam and Leukefeld (2003) as well as Gay et al. (2011) have also observed a negative correlation between anxiety and sensation seeking, suggesting that anxiety might be related to a lack of openness to experience. Another study (Zermatten & Van der Linden, 2008) has shown specific relationships between urgency and compulsions, and between lack of perseverance and obsessive thinking.

Whiteside and Lynam (2001) originally validated the UPPS Impulsivity Scale, which was later validated in French (Van der Linden et al., 2006). It is a 45-item self-report inventory, divided into four subscales: urgency (Cronbach's alpha: .83), lack of premeditation (Cronbach's alpha: .84), lack of perseverance (Cronbach's alpha: .82), and sensation seeking (Cronbach's alpha: .78). Both English and French validation studies replicated the expected four-factor solution. Items are rated on a 4-point scale from 1 (I completely agree) to 4 (I completely disagree). Further, clinical studies have shown that it is sensitive to the effects of treatment (e.g. Deplus, Billieux, Scharff, & Philippot, 2016).

### **Conclusions and perspectives**

The present paper defends the notion that psychological interventions should primarily target the psychological processes responsible for the onset and/or maintenance of mental disorders. It departs from other transdiagnostic single universal process approaches, such as the Unified protocol of Barlow (Barlow et al., 2004), as it postulates that several processes are differentially active in psychopathology, and that to be efficacious, interventions must target the specific processes that are active in a specific case. In the present process-based approach, case conceptualization is central, while it is not required by single universal process accounts. In the same line, it also differs from accounts that consider one specific domain of processes, such as emotion regulation (e.g. Kring & Sloan, 2010). By its wide scope of psychopathological disorders covered, the present process-based approach also differs from accounts targeting multiple processes but limited in the range of disorders covered, such as the transdiagnostic approach to eating disorder of Fairburn, Cooper, and Shafran (2003). The present approach is akin to the account of Harvey, Watkins, Mansell, and Shafran (2004) that postulates multiple processes that are universally applied. It goes further, though, by defining more specifically these processes and by providing a rationale and procedure for case conceptualization.

Although logically appealing, the process-based perspective on psychotherapy faces many challenges, with the most important ones directly addressing its key feature: the concept of process itself. First, the very notion of process is difficult to define, and the literature is surprisingly reticent on this subject. We have attempted to provide a working definition of psychological processes from a functionalist and clinical perspective. This definition is limited by the fact that it includes the notion of psychological element, which is itself difficult to define without circularity. Still the definition proposed is constrained enough to support a rationale for deciding whether a psychological component is a process, and for distinguishing processes from other notions, such as symptoms.

Second, the psychopathology literature has evidenced a myriad of psychological processes that are active in mental disorders. Clinicians (as well as researchers) might become lost amidst this abundance. A classification of the psychological processes relevant to psychopathology is thus necessary for the process-based approach to psychotherapy to be of practical use in clinical settings. We have attempted to address this difficulty by proposing a tri-dimensional classification, accounting not only for the psychological domains, but also for their inter- versus intrapersonal nature, and their level of specificity.

Finally, we have applied the process-based approach to case conceptualization in mood and anxiety disorders. We have proposed a set of core processes for which we have found converging evidence in the literature regarding their role in the onset and/or maintenance of mood and anxiety disorders. For each process, we have identified an assessment questionnaire. Evidently, questionnaires relying on the verbal self-report of the clients are limited in several ways, including the limited insight of the clients, and the fact that some processes are implicit and not directly accessible to conscious observation by the client. Questionnaires are thus one source of information that needs to be complemented by other sources, such as direct observations by the clinician, interviews, and behavioral tests. Still, questionnaires are valuable as they allow a wide range of information to be rapidly and economically collected. Also, they are easy and practical to use in most clinical settings. However, they only very partially capture the dynamic nature of processes. New approaches to idiographic assessment, capturing the dynamic of psychological phenomena through diaries, have recently been proposed in the literature (Fischer, 2015; Haynes, Mumma, & Pinson, 2009; Mumma,

2011). However, these approaches require intense data collection (at least 7 entries a day, for at least 7 days) and sophisticated statistical methods (dynamic time series regression analysis or dynamic factor analysis) that are presently beyond the reach of most practitioners. In order to address this concern, we are presently investigating the possibility of using smartphone diaries in order to find a relatively convenient way of capturing the dynamic nature of processes. However, the translation of these data into clinically usable information still requires much development.

The present system and approach to case conceptualization is at the beginning of its empirical validation. A case study has been published, documenting the feasibility and usefulness of this approach (Dethier, Baeyens, Bouvard & Philippot, 2015). We are presently conducting a study comparing the present process-based approach to classical cognitive therapy conceptualization (TARRIER, 2006). We are investigating possible differences in terms of (a) treatment strategies chosen by the clinician following case conceptualization and (b) mutual understanding of the case by the client and by the therapist.

The next step for the process-based approach to clinical treatment is to identify interventions that have an empirically proven effect on specific target processes. The literature has already shown good evidence for the efficacy of several process-based interventions, such as Rumination Focus-CBT (Watkins, 2015) for rumination, metacognitive therapy (Wells, 2008) for metacognition, or the intolerance-focused intervention for intolerance to uncertainty (Dugas & Ladouceur, 2000). The proposed perspective thus opens an avenue for individualized, empirically-based, psychological treatments of a new kind.



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Table 1. Definition of the Dimensions Differentiating Psychological Processes

Dimension	Definition
Psychological Domain	The psychological domain to which the process belongs: motivation, emotion, cognition, behavior.
Level of Specificity	The level of specificity at which the process is conceptualized, from molecular (e.g. attention disengagement deficit) to molar (e.g. mental rumination)
Inter- vs. Intra-Personal Process	Whether the process pertains to self-regulation or to interpersonal and social regulation

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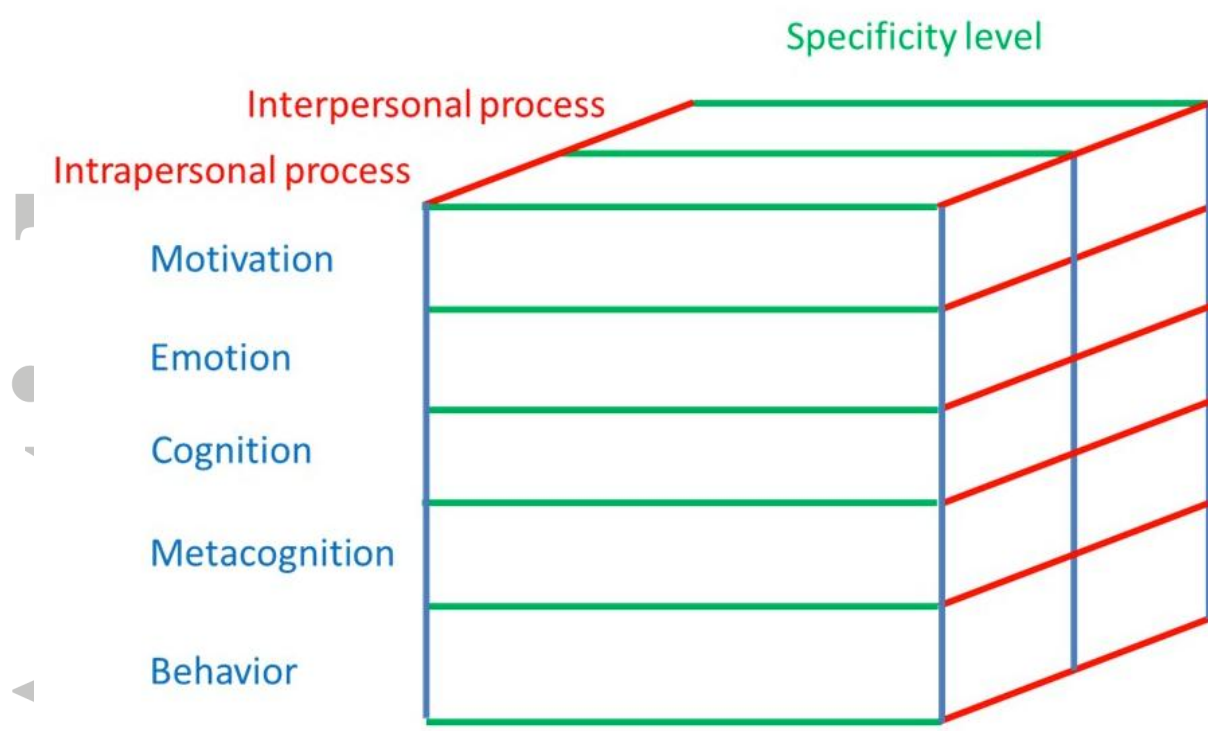


Figure 1. A tri-dimensional categorization of psychological processes

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