



### *Special issue paper*

## Depression and propection

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**Objectives.** Propection, the mental representation of possible futures, is usually adaptive. When it goes awry, however, it disrupts emotion and motivation. A negative view of the future is typically seen as one symptom of depression, but we suggest that such negative propection is the core causal element of depression. Here, we describe the empirical evidence supporting this framework, and we explore the implications for clinical interventions.

**Methods.** We integrate several literatures: Using the database PsycInfo, we retrieved empirical studies with the keywords *propection*, *prediction*, *expectation*, *pessimism*, *mental simulation*, *future-thinking*, *future-directed thinking*, *foresight*, and/or *mental time travel*, in conjunction with *depression*, *depressed*, or *depressive*.

**Results.** Three kinds of faulty propection, taken together, could drive depression: Poor generation of possible futures, poor evaluation of possible futures, and negative beliefs about the future. Depressed mood and poor functioning, in turn, may maintain faulty propection and feed a vicious cycle. Future-oriented treatment strategies drawn from cognitive-behavioural therapy help to fix poor propection, and they deserve to be developed further.

**Conclusions.** Propection-based techniques may lead to transdiagnostic treatment strategies for depression and other disorders.

### Practitioner points

- Faulty propection may be the core process underlying depression.
- Three general problems of propection, taken together, could drive depression: Poor generation of possible futures, poor evaluation of possible futures, and negative beliefs about the future.
- Faulty propection can be helped using future-oriented treatment strategies from cognitive-behavioural therapy, and basic research on propection points to additional future-oriented clinical strategies for alleviating depression.
- More research is needed to determine whether propection drives depression, and whether future-focused interventions are more effective than those focused on the past and present.

### Propection awry and depression

Propection, the mental representation of possible futures, is a ubiquitous part of mental life (Seligman, Railton, Baumeister, & Sripada, 2013). Evolutionary processes probably

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favoured prospection because it helps humans plan and prepare for the future and therefore survive, reproduce, and thrive (Boyer, 2008; Suddendorf, 2006; Suddendorf & Busby, 2005; Suddendorf & Corballis, 2007; Suddendorf & Henry, 2013). When simulating possible futures, people pre-experience possible consequences of these futures in real time; they feel anxiety, joy, or sadness depending on the nature of their simulations (Gilbert & Wilson, 2007). When functioning normally, pre-experiencing likely facilitates better decision-making by helping people plan, self-regulate, and problem-solve (Taylor, Pham, Rivkin, & Armor, 1998).

We propose that when prospection goes awry, it negatively influences emotion, cognition, and behaviour, and that depression is the paradigm case of this. We present a framework in which faulty prospection is the core causal process of much depression. Although we focus on depression, a growing body of research also highlights the ways in which faulty prospection may contribute to other types of psychopathology (Alloy *et al.*, 2008; Carleton *et al.*, 2012; Kane, Loxton, Staiger, & Dawe, 2004; Turken, Vuilleumier, Mathalon, Swick, & Ford, 2003). Transdiagnostic approaches, which highlight similarities across diagnostic categories rather than using disorder-specific theories (Mansell, Harvey, Watkins, & Shafran, 2009), hold great promise for alleviating suffering by targeting the core underlying processes that produce and maintain pathology (Forgeard *et al.*, 2011; Harvey, Watkins, Mansell, & Shafran, 2004). We propose that faulty prospection is one such pervasive and underlying process.

## Mental representation of possible futures

In the last two decades, important work has shed light on future-oriented thinking (Buckner & Carroll, 2007; Gilbert & Wilson, 2007; MacLeod, Byrne, & Valentine, 1996; Miloyan, Pachana, & Suddendorf, 2014; Seligman *et al.*, 2013; Suddendorf & Busby, 2005; Taylor *et al.*, 1998). For many years, however, future-thinking was relatively neglected within the field of clinical psychology and the weight of aetiology was mostly placed on the past. Early psychoanalytic approaches emphasized the past as a main cause of present pathology (Freud, 1920). Classical behavioural approaches also emphasized the past: A person's history of instrumental reinforcement and of classical conditioning was viewed as a crucial tool for understanding his/her present and future behaviours (Pavlov, 1927; Watson & Rayner, 1920).

Nonetheless, future-oriented themes can be found in past theoretical and empirical work, and scholars in behaviourism and cognitive psychology laid the groundwork for recent research on future-oriented cognition. Our prospective framework for understanding depression unifies and extends others' work within clinical psychology. First and foremost, we build upon Beck's (1974) negative cognitive triad, which marked major theoretical progress in the study of depression. Beck postulated a negative view of the world, of the self, and of the future as the hallmark symptoms of depression, and suggested they were more than mere symptoms – that they caused depression. We agree with this perspective, particularly in the light of the empirical evidence supporting it (e.g., Abela & D'Alessandro, 2002; Alloy *et al.*, 2006; Hankin, Abramson, Miller, & Haeffel, 2004; Wang *et al.*, 2013) – and we further suggest that the negative view of the future is the first among equals in the triad. Much research and therapeutic work focuses on negative views of the self (e.g., Fennell, 1997; Metalsky, Joiner, Hardin, & Abramson, 1993; Orth, Robins, & Roberts, 2008), but negative views of the future may matter even more; we hypothesize that the entire cognitive triad may actually boil down to negative future-thinking.

Certainly, it is depressing for people to believe that they are no good, that the world is no good, and that this will always be the case. In contrast, if people think that they are no good and that the world is no good, but that this could change for the better tomorrow, this is not nearly as disheartening. Sadness and dejection are understandable reactions to the belief that things will always be bad. The emotional reaction is not faulty here, but rather the mental representation of the future is. Beck posited that by helping clients to spot and change dysfunctional beliefs, therapists could alleviate symptoms; in the same vein, we posit that by helping clients to spot and change dysfunctional *if-then* simulations of the future, therapists can promote recovery and resilience. Targeting this part of the cognitive triad might be one of the most important existing interventions (and the most important target for further development).

Our prospective framework also extends and enriches Abramson, Metalsky, and Alloy's (1989) hopelessness theory of depression, which posits that hopelessness is sufficient for causing a subtype of depression. Our framework integrates their work with others', placing global hopelessness within a broader context. For instance, we link the hopelessness theory to the key contributions of MacLeod *et al.*, who have identified specific problems in mental simulation that characterize hopelessness, depression, anxiety, and suicidal behaviour (e.g., MacLeod & Cropley, 1995; MacLeod, Tata, Kentish, & Jacobsen, 1997; MacLeod *et al.*, 1996, 2005). Likewise, we integrate this literature with the two models of future-thinking in anxiety and depression proposed by Miloyan *et al.* (2014): The reconstructive memory model (which posits that negatively biased memory retrieval leads to negatively biased construction of future scenarios) and the valuation model (which posits that biased estimations and processing of risk and uncertainty lead to anxious and depressed future-thinking). We converge with Miloyan *et al.* in (1) focusing squarely on the importance of foresight in depression, (2) distinguishing between the role of construction and evaluation/anticipation of future scenarios, and (3) considering prospection as a transdiagnostic process that applies to disorders beyond MDD. We diverge with them in that we frame future-thinking as a cause of depression rather than as a feature, symptom, or correlate.

We see faulty prospection as a core underlying process that drives depression (and potentially contributes to a range of other 'comorbid' disorders). This framework points to testable predictions about the development and treatment of depression. Overall, our aim is to stimulate theoretical and empirical work on prospection and mental illness. The important body of work on depressed and anxious people's prospective processes (e.g., MacLeod & Salaminiou, 2001; MacLeod *et al.*, 1996; Miloyan *et al.*, 2014; Williams *et al.*, 1996) needs to be embraced and extended. We believe that prospection is not a mere symptom or correlate of depression, but rather the process that belongs front and centre in the study of depression.

In Part I, we integrate diverse work to illuminate how three kinds of faulty prospection may cause and maintain depression. In Part II, we address the clinical implications of this view, exploring how improving prospection can alleviate depression. In Part III, we suggest that a prospective framework can be extended to other types of psychopathology. We also offer testable predictions about depression treatment outcomes, and we address the framework's limitations.

## **Part I: How dysfunctional prospection creates and maintains depression**

Modern interventions have hit a barrier in the treatment of MDD. Only about 35–50% of patients respond adequately to antidepressant medication, the first-line treatment

(Hollon, Thase, & Markowitz, 2002; Kirsch, Scoboria, & Moore, 2002). Talk therapies fare no better: Interpersonal therapy and CBT yield recovery rates of just 43% and 36% respectively, and both the medication and psychotherapy rates may be overly optimistic given the high placebo rate (Butler, Chapman, Forman, & Beck, 2006; Elkin *et al.*, 1989). This discouraging situation has been referred to as the *65% barrier*, as each treatment method typically yields no better than about a 65% success rate (Seligman, 2012).

To overcome the 65% barrier for MDD, we propose that depression might be fruitfully recast as a disorder that is driven primarily by poor prospection. We suggest that depressed people simulate the future in a way that creates, exacerbates, and maintains dysfunction: In their *if-then* simulations, *if* clauses are frequently finished with negative, and even catastrophic *then* clauses (e.g., 'If I try to talk things out with my partner, then it will just make things worse', 'If I don't sleep well tonight, then tomorrow will be awful'). These if-then conditionals may be expressed in words or images, and they may be more or less conscious (Seligman *et al.*, 2013). This negative style is likely to be most pronounced in *self-relevant* prospection rather than prospection about others (MacLeod & Conway, 2007; Philippi & Koenigs, 2014).

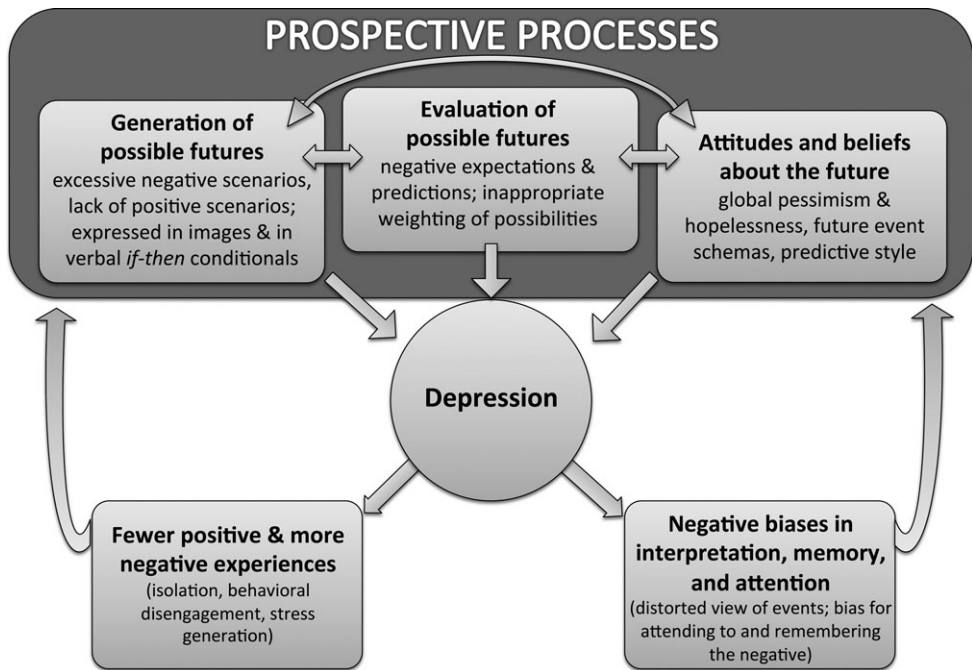
Negative prospection and depression itself are not inherently dysfunctional, maladaptive, or problematic; indeed, they could be essential for adaptive functioning, and constant optimism would have serious costs (Andrews & Thompson, 2009; Miloyan, Bulley, & Suddendorf, 2015; Nettle & Bateson, 2012; Nesse, 1999, 2000, 2004; Norem & Chang, 2002). Thus, we wish to distinguish negative prospection from faulty prospection. By *negative prospection*, we mean representations of an undesirable future, representations which are normal and often useful; by *faulty, poor, or dysfunctional prospection*, we mean particular patterns of representations of the future in which negative content predominates and leads to significant impairment.

In the framework we propose, three general faults of prospection drive depression: Poor generation of possible futures, poor evaluation of possible futures, and negative attitudes and beliefs about the future. Further, we propose that depressed mood and poor functioning, in turn, maintain these prospection faults and feed a vicious cycle. We now detail this framework, and we refer the reader to Figure 1 for a conceptual diagram.

### **Three faults of depressive prospection**

#### *Simulation of possible futures*

The first fault concerns the construction of possible futures. There is some evidence that depressed people (like anxious people) tend to imagine negative future scenarios more quickly and easily than controls do (MacLeod & Byrne, 1996; MacLeod & Cropley, 1995; Miles, MacLeod, & Pote, 2004). The more robust and distinctive finding is that depressed and hopeless people tend to imagine fewer positive scenarios (Bjärehed, Sarkohi, & Andersson, 2010; MacLeod, Pankhania, Lee, & Mitchell, 1997; MacLeod & Salaminiou, 2001; MacLeod, Tata, Kentish, Carroll, & Hunter, 1997; MacLeod, Tata, Kentish, & Jacobsen, 1997; Stöber, 2000). Moreover, depressed people imagine positive future events less vividly than controls do (Morina, Deeprose, Pusowski, Schmid, & Holmes, 2011). This is a problem because vividly imagined scenarios are more believable than vague ones (Hackmann & Holmes, 2004). Moreover, vivid images evoke stronger emotions than words do (Holmes & Mathews, 2010). Vivid mental images of one's own death are especially dangerous, as these *flashforwards* are linked to increased suicide risk (Hales, Deeprose, Goodwin, & Holmes, 2011). Conversely, imagining positive future events may buffer against suicidality and can



**Figure 1.** Conceptual diagram.

predict suicidality better than global hopelessness does (O'Connor, Fraser, Whyte, MacHale, & Masterton, 2008; O'Connor *et al.*, 2007).

Depressed people might struggle to imagine a good future because they struggle to recall a good past: Autobiographical memory is vague (Dalglish *et al.*, 2007), especially for positive memories (Williams & Scott, 1988). As Miloyan *et al.* (2014) propose in their reconstructive memory model, biased retrieval of past episodes influences the construction of future episodes. Memory is one source of input for prospection (Szpunar, 2010), so people with no vivid positive memories may find it harder to create vivid positive simulations. This problem may be compounded by depressed people's executive functioning deficits (McDermott & Ebmeier, 2009). Executive functioning encompasses voluntary self-regulatory processes like cognitive flexibility, planning, problem-solving, selective attention, inhibition of irrelevant responses, and initiation of appropriate search strategies and is thus needed for retrieving specific memories and for constructing specific future episodes (Dalglish *et al.*, 2007; Suddendorf & Redshaw, 2013; de Vito *et al.*, 2012).

#### *Evaluation of possible futures*

The second prospection fault concerns the evaluation of future scenarios. Whereas the above problems are about the construction of specific scenarios, evaluation problems are about *generalized* expectancies (O'Connor & Cassidy, 2007). As Miloyan *et al.* (2014) outline in their valuation model, depressed people tend to overestimate, overweigh, and over-attend to risk – and this produces more negative expectations of the future. Depressed people not only judge bad things as highly likely but also generate more reasons why this would be the case (Alloy & Ahrens, 1987; MacLeod, Tata, Kentish,



Carroll, 1997). These predictions are overblown (Strunk, Lopez, & DeRubeis, 2006), yet greater depression goes hand-in-hand with greater certainty about these predictions (Miranda & Mennin, 2007). Depressed people not only expect bad outcomes, but also expect to have little power to change them, even following experiences of success (Abramson, Garber, Edwards, & Seligman, 1978; Seligman, 1972). These negative expectations have even been found on implicit measures of future-thinking (Kosnes, Whelan, O'Donovan, & McHugh, 2013).

At the extreme end of pessimism, we find hopelessness and depressive predictive certainty, a black-and-white expectation that negative outcomes will occur and positive outcomes will not (Abramson *et al.*, 1989; Andersen, 1990; Beck, Weissman, Lester, & Trexler, 1974; Miranda, Fontes, & Marroquín, 2008). Depressive predictive certainty is toxic: People who are certain that good things will not happen tend to have more suicidal ideation, even after adjusting for depressive symptoms and general hopelessness (Sargalska, Miranda, & Marroquín, 2011). Likewise, hopeless people are at a higher risk of killing themselves (Kovacs & Garrison, 1985), and hopelessness may be sufficient for causing depression symptoms (Abramson *et al.*, 1989; Hamilton *et al.*, 2013; Joiner, Wingate, & Otamendi, 2005).

These general negative expectations are related to specific simulations of the future: For instance, repeatedly simulating emotionally charged scenarios makes them more believable, so repeatedly simulating negative (and not positive) events should produce negative expectations for the future (Szpunar & Schacter, 2013). Indeed, the fewer positive events a person imagines, the greater his/her hopelessness (MacLeod *et al.*, 2005; Sidley, Calam, Wells, Hughes, & Whitaker, 1999). Clearly, both specific simulations and general expectations are important to target in interventions, and CBT does just that (Beck, Rush, Shaw, & Emery, 1979).

### *Negative beliefs about the future*

The third problem with depressed people's prospection concerns their templates for understanding what the future holds. *Future event schemas* are patterns of representations about the future (Andersen & Limpert, 2001) that, like all schemas, help people organize incoming information (Piaget, 1926). Depressed people are just as fast and just as negative in making predictions with or without extra attentional load (Andersen, Spielman, & Bargh, 1992), suggesting that they rely on automatic, negative templates for predicting the future. This may be influenced in part by the executive function issues described above: Deficits in planning, problem-solving, cognitive flexibility, and the like could make it difficult to generate and evaluate a diverse array of outcomes (McDermott & Ebmeier, 2009).

We propose that a template we call *pessimistic predictive style* is particularly relevant to depression. This parallels pessimistic explanatory style (PES), a characteristic tendency to explain past and present events with certain causes (Peterson *et al.*, 1982). A person with a PES explains negative experiences with causes that are personal, pervasive, and permanent (Peterson & Seligman, 1984): Bad things happened because of one's own shortcomings, which poisoned all domains of life, and always will. Depressed people tend to have a marked PES (Alloy, Abramson, Metalsky, & Hartlage, 1988; Peterson & Seligman, 1984; Seligman, Abramson, Semmel, & Von Baeyer, 1979). In parallel, depressed people explain good events with impersonal, transient, and specific causes.

Explanatory style is just the past side of the coin, however, and the future side has been neglected. To appreciate the shortcomings of explanatory style theorizing and to

appreciate why the present framework is an advance, we must return to the scientific atmosphere of the late 1970s. Behaviourism was just giving way to cognitive psychology, but cognitive psychology was only about memory and perception, not about expectations of the future. When explanatory style was first formulated (Abramson, Seligman, & Teasdale, 1978), theorizing about mental life had just become acceptable, but only if the mental life was about the present and the past. This unstated premise of avoiding future-oriented cognitions permeated both explanatory style theory and Beck's theory as well. Why? Essential to behaviourism and to early cognitive theory is that no reference should be made to teleology; its mission was to explain the apparently forward-looking behaviour of animals only by the past and the present. Drives and reinforcers might be more varied for humans, and humans might be capable of longer stimulus-response chains and wider stimulus-generalization, but there were to be no exceptions to the mechanical model – notions such as expectations of as yet non-existent future events were an invitation to untestability at best, and obscurantism and incoherence at worst.

Cognitions about past experience and present events would, it was hoped, determine cognitions about the future. So when explanatory style was formulated, it was about past and present events, with the unspoken premise that these would somehow determine cognitions about the future. Even in the 1970s, this premise was shaky, since as Brickman *et al.* (1982) astutely pointed out, explanations for the cause of a problem do not imply parallel explanations for its solution: The cause of facial disfigurement might be external, temporary, and local (a madman throwing acid at my face) but the implications for the future (endless surgeries and social rejections) permanent and pervasive.

Explanatory style theorizing needs another side of the coin: Predictive style (attributions about the causes of future events). This is a relatively neglected area of research. A pessimistic predictive style (PPS) should have the same features as a pessimistic explanatory style: Depressive predictions about if-then sequences in the future are likely (1) pervasive, (2) permanent, and (3) personal (e.g., 'if I don't perform well on this test, then I'll never succeed and I'll die a failure'), and the predictive style about good events should be the opposite. Explanatory style about the past and present might be strongly correlated with predictive style about the future, and this is a good topic for research (Alloy & Ahrens, 1987; Weiner, 1985). More importantly, empirical work should compare the power of explanatory style and predictive style regarding the cause and maintenance of depression: Within the prospective framework of depression, we hypothesize that people's predictions about the future should influence their behaviour more than their explanations of the past and of the present.

### **A vicious cycle**

We have proposed that faulty simulations, evaluations, and beliefs about the future drive depression. We suggest that these three problems interact with one another to create some of the hallmark characteristics of MDD: first and foremost, depressed mood, irritability, low energy, amotivation, apathy, and suicidality. We also suggest that problems in prospection drive much of the overall dysfunction seen in MDD. We do not argue, however, that poor prospection causes *all* symptoms of MDD listed in the Diagnostic and Statistical Manual (DSM; American Psychiatric Association, 2013); for instance, it is more difficult to imagine how prospection would cause concentration problems, loss of pleasure, or psychomotor agitation. This may be because the DSM does not necessarily carve nature at the joints – that the varied MDD symptoms listed in the DSM do not constitute a single distinct disease (Gorman, 1996; Haslam, 2003; Haslam & Beck,

1994; Ruscio & Ruscio, 2000). Regardless, faulty prospection is neither necessary nor sufficient for MDD (as it is now defined). Rather we hypothesize that faulty prospection is the primary cause: That it accounts for more of the variance in MDD than other causes such as the negative view of the self, negative view of the world, and pessimistic explanatory style.

We also propose that faulty prospection sets up a vicious cycle. It produces depression, and depression, in turn, maintains poor prospection in at least three ways. First, depressed people withdraw socially, limit their activities, and rely on avoidance coping, and thus have fewer positive experiences (Holahan, Moos, Holahan, Brennan, & Schutte, 2005; Kasch, Rottenberg, Arnow, & Gotlib, 2002). Because of this, they have fewer raw materials for constructing positive future scenarios, as we use information about the past to prospect about the future (Szpunar, 2010). Second, depression leads people to act in ways that create stressful experiences and interpersonal conflicts (Hammen, 2006; Liu & Alloy, 2010) – and these negative experiences provide raw material for vivid negative simulations of the future. Third, simply being in a sad mood can make one more likely to remember a negative past and imagine a negative future (Buchanan, 2007; Hepburn, Barnhofer, & Williams, 2006; de Jong-Meyer, Kuczmera, & Tripp, 2007; Miloyan *et al.*, 2014; O'Connor & Williams, 2014).

## **Part II: Improving prospection with cognitive-behavioural therapy**

If faulty prospection drives depression, then interventions should aim to fix prospection. CBT therapists already have some future-oriented strategies in their quivers (Seligman *et al.*, 2013) and these deserve to be formalized, extended, and grouped together. One can be a competent CBT therapist and focus entirely on future cognitions or ignore them altogether. CBT adherence protocols do not explicitly rate attempts to change faulty prospection. The Collaborative Study Psychotherapy Rating Scale (Hollon *et al.*, 1988), for example, lists 32 CBT procedures; none of them explicitly target prospection and only three implicitly target prospection (setting up behavioural experiments to test beliefs, exploring realistic consequences of actions, and scheduling pleasant activities).

Here is a hypothetical that highlights the difference between CBT interventions that neglect versus target prospection: A depressed woman has argued with her husband, and her therapist uses a cognitive intervention to challenge her distorted, upsetting thoughts about the argument. The therapist chooses one of two interventions, both of which are classic CBT (Beck, 1995): Intervention A neglects the woman's thoughts about her future, whereas Intervention B squarely focuses on them.

In Intervention A, the therapist considers the client's automatic thoughts about the fight and decides that this one is the most important: 'He must think I'm a horrible person'. (In the depressive cognitive triad, this reflects a negative view of the self.) The client and therapist identify the cognitive distortion underlying this thought (mind-reading) and then consider the evidence for and against the thought. They consider times in the past when the client's husband has said positive things about her, times when she has acted in a caring way towards him, and times when they reconciled after a fight and did not judge each other harshly. The client decides that her husband probably has a balanced and compassionate view towards her, and she feels better for now.

This is a perfectly adherent cognitive intervention, but it leaves the client's faulty prospection intact. Even as the client comes to believe that her husband still loves and respects her, she is bothered by a nagging fear that it is just a matter of time before he



leaves her. She disqualifies the past evidence (e.g., that he has forgiven her after past fights), saying to herself, ‘that was then; things will get worse this time’. She still runs if-then simulations that end with divorce, and she still vividly imagines a sad future: Visions of divorce papers, a living room filled with boxes containing her husband’s belongings, and courtroom appearances about child custody. She is still deeply pessimistic, and still prone to feeling depressed whenever she runs these recurring negative simulations.

In Intervention B, which targets prospection, the therapist decides to explore this automatic thought instead: ‘I am going to drive this relationship into the ground’. (In the depressive cognitive triad, this reflects a negative view of the future.) The client and therapist identify the imagery tied to this prediction. They spot the cognitive distortions of fortune-telling and catastrophizing, and then consider the evidence for and against the prediction (Beck & Weishaar, 1989; Burns, 1980). They generate other possible outcomes (e.g., reconciling, using the incident to strengthen their bond, etc.), and they review the evidence for these. They also explore actions that would lead to positive outcomes (e.g., change communication styles in couples’ therapy). The client decides that her marriage is not doomed and she feels better.

This, too, is an adherent cognitive intervention, but it directly addresses the client’s thoughts about her future. The best possible outcome of this intervention would be an end to the client’s catastrophic predictions and imagery about her future. She considers a broader, more realistic, and more empowering array of if-then scenarios. Of course, this change will not come quickly or easily; initially such future-based interventions will likely be very effortful because the client’s faulty prospection is so entrenched. This is exactly why such interventions are needed, however, and in the long run, we hypothesize that these interventions will prove more protective than other cognitive interventions.

CBT therapists face many decision points during a single therapy session. Which problem should be prioritized? Which automatic thought should be targeted? Which Socratic questions should be used to examine distorted thoughts? If faulty prospection is indeed central to depression, then therapists should abide by two guiding principles when making these decisions:

1. When there is a choice to work on one of several automatic thoughts, target the thought about the future, unless there is a compelling rationale to do otherwise.
2. When no dysfunctional thought about the future is immediately evident, search for it. If needed, *downward arrow* questions (Friedman & Thase, 2006) should be used until the underlying prospective thought is discovered.

We hypothesize that when therapists systematically and extensively target depressive prospection, then CBT will work better. Here, we summarize how CBT already improves prospection and then we outline promising new future-oriented treatment strategies.

### **How CBT already targets faulty prospection**

At least four CBT manoeuvres already fix prospection, and there is evidence that CBT improves future-thinking (Andersson, Sarkohi, Karlsson, Bjärehed, & Hesser, 2013; MacLeod *et al.*, 1998). First, therapists work to change clients’ pessimistic predictions: They help clients spot future-focused distortions like catastrophizing and fortune-telling (Burns, 1980; Sullivan, Bishop, & Pivik, 1995), and they use Socratic questions to coach them in creating accurate predictions (Beck, 1995). Second, therapists train clients in goal-setting and planning strategies, and goals, to be sure, are inherently future-directed (Malouff, Thorsteinsson, & Schutte, 2007; Rupke, Blecke, & Renfrow, 2006; Wright,

Basco, & Thase, 2006). Third, therapists use cognitive rehearsal to plan how to overcome obstacles (Beck *et al.*, 1979). Fourth, therapists use behavioural activation to help clients schedule pleasant, mastery-inducing experiences in the future (Jacobson, Martell, & Dimidjian, 2001; Martell, Addis, & Jacobson, 2001). Importantly, the creation of new positive experiences provides raw material for new positive simulations, as memories influence prospection (Williams *et al.*, 1996). To maximize impact on prospection, the therapist could use specific strategies to link the clients' positive experiences with their simulations of the future. For instance, the therapist could guide the client in vividly imagining and elaborating each positive experience, as elaboration could allow the positive memory to be more easily retrieved later (Boland, Haden, & Ornstein, 2003).

In addition to these four techniques, CBT may promote better prospection in two general ways. First, therapists may generate hope. Technique aside, clients can start envisioning a brighter future simply because they are taking steps to feel better and they have found support (Snyder, Michael, & Cheavens, 1999). Second, CBT therapists may promote better prospection by shifting focus from the past and the present to the future (Beck, 2005; Ellis, 2001).

Several treatment packages combine various techniques to systematically target future-thinking. These include future-directed therapy (Vilhauer *et al.*, 2012), hope therapy (Cheavens, Feldman, Gum, Michael, & Snyder, 2006), solution-focused therapy (de Shazer, 1985), goal-setting and planning (MacLeod, Coates, & Hetherington, 2008), and future-oriented group training (van Beek, Kerkhof, & Beekman, 2009). In most cases, these interventions still need more randomized controlled evaluations before being considered empirically supported treatments (Chambless & Hollon, 1998), but their initial findings, noted below, are promising.

First, future-directed therapy (FDT) is a 10-week intervention intended to decrease depression and increase well-being by teaching skills aimed at promoting a paradigm shift from dwelling on the past, or highlighting one's limitations in the present, towards creating more positive expectancies about the future (Vilhauer *et al.*, 2012, p. 103).

These skills include generating positive expectancies, practicing mindfulness, identifying and working towards values, simulating outcomes and processes, and solving problems. In a non-randomized pilot, FDT produced greater improvements in depression than treatment-as-usual (Vilhauer *et al.*, 2012).

Second, hope therapy is 'a treatment protocol designed to increase hopeful thinking and enhance goal-pursuit activities as described in hope theory' (Cheavens *et al.*, 2006, p. 64). This protocol focuses on five skills: Setting goals, finding multiple paths to goals, increasing motivation, monitoring progress, and flexibly modifying goals and pathways. In the initial RCT, hope therapy reduced depression symptoms better than a waiting list control (Cheavens *et al.*, 2006).

Third, solution-focused therapy (de Shazer, 1985) is built on the premise that a future-orientation is necessary for positive change (Lankton, 1985). This therapy encompasses a whole suite of techniques, at least three of which are clearly future-oriented (Bozeman, 2000): The miracle question technique (de Shazer, 1985), the scaling questions technique (de Shazer, 1982), and the first session formula task (de Shazer, 1985). Solution-focused brief therapy has demonstrated positive outcomes in treating depression (Bozeman, 2000; Rhee, Merbaum, Strube, & Self, 2005; Smock *et al.*, 2008; Sundstrom, 1993).

Fourth, goal-setting and planning (GAP) is a manualized well-being intervention focused on developing and pursuing positive goals, rather than solving problems or directly targeting depressive symptoms (MacLeod *et al.*, 2008). It has been tested in

group-based and individual self-help formats and found to decrease depression in both (Coote & MacLeod, 2012; Ferguson, Conway, Endersby, & MacLeod, 2009).

Fifth, future-oriented group training (van Beek *et al.*, 2009) is a newer intervention specifically targeting suicidality, intended as an addition to other treatment. Over the course of 10 workshops, participants learn how to change their future-oriented thinking and behaviour, and work towards goals that will make life worthwhile. Results of the initial trial, yet to be published, indicate that this training did not significantly reduce suicidality (above and beyond treatment-as-usual); however, it did improve overall psychiatric symptoms, distress, and quality of life, suggesting that further refinement and testing is worthwhile (van Beek, 2013).

Clearly, these treatment packages are not radical departures from standard CBT. Instead, they use strategies that emphasize the importance of fixing faulty prospection. These interventions merit further investigation in randomized controlled trials. There is moreover a need to develop new future-oriented treatment strategies and so we now speculate on several new techniques.

### **Promising new future-oriented techniques**

#### *Route-based imagery*

Imagery techniques have not been fully exploited in CBT for depression. Popular, sometimes footless, self-help programs emphasize the importance of visualizing the outcomes you want in life (e.g., Byrne, 2006). But it is not enough to visualize a better future; it is essential to visualize the route that leads there (Kapes & Oettingen, 2011; Oettingen, Hönig, & Gollwitzer, 2000; Taylor *et al.*, 1998). Route-based imagery involves identifying behaviours, thoughts, or feelings that lead to the desired outcome – and this planning provides a foundation to work from in striving towards goals. In a series of experiments, students who visualized routes fared better than students who visualized outcomes: They got higher test scores, finished projects more quickly, and used more active coping strategies (Taylor *et al.*, 1998).

This finding is relevant to treatment: Depressed people who visualize themselves taking small, concrete steps towards well-being might recover faster than those who just visualize good outcomes (or do not visualize at all). Visualizing good events can lift mood (Quoidbach, Wood, & Hansenne, 2009) but failing to visualize the route there could be risky. If a person vividly sees a wonderful future but remains convinced it is blocked, this could maintain depression; indeed, depressed and hopeless people, and those with recent suicidal behaviour, do not necessarily abandon their goals but rather they have painful engagement, seeing their goals as both essential for happiness and too hard to achieve (Danchin, MacLeod, & Tata, 2010; Dickson, Moberly, & Kinderman, 2011; Hadley & MacLeod, 2010; Vincent, Boddana, & MacLeod, 2004).

#### *Manipulations of time perspective*

When using Beck's (1970) *time projection* technique, therapists help clients to relax deeply and then to project themselves into the future and vividly imagine rewarding experiences. This is similar to Erickson's (1954) *pseudo-orientation in time* procedure, in which clients first project themselves into a time when their troubles are resolved (Miller & Berg, 1995). They then converse with the therapist as if they were truly in the future, and they describe the process by which they improved their

lives and solved their problems. Do time perspective methods work? Research is limited and outdated, and findings are mixed (Beck, 1970; Burton, 1979; Erickson, 1967; Lazarus, 1968). Likely, time projection needs to be refined to better target relevant mechanisms. Specifically, the research of Taylor *et al.* (1998) suggests that time projection techniques will fail when they emphasize outcome simulations and not route simulations.

#### *Anticipatory savouring*

It is important that clients not only simulate small steps forward, but also that they enjoy these steps. Route-based imagery could easily focus just on necessary evils: Clients could be coached in simulating unappealing small steps (e.g., working through manageable chunks of a big problem concerning money). This would be unfortunate, because it is important to have something to look forward to. Why, indeed, should people have something to look forward to? Simulations of a positive future make people pre-feel positive emotions (Gilbert & Wilson, 2007) and, we propose, pre-experience a sense of connectedness, meaning, or mastery. These small uplifts could be especially important against a background of crushing depression.

Therapists can teach depressed people *anticipatory savouring* (Loewenstein, 1987), as well as mindful awareness and appreciation of the process of striving for meaningful goals (McCullough, 2002). One positive psychotherapy (PPT) exercise called the *three good things* technique can be modified to be future-focused instead of past-focused (Seligman, Rashid, & Parks, 2006). In the original exercise, people keep daily logs of three positive things that happened, and what they did to make these things happen. In the prospective exercise (*three good things tomorrow*), depressed clients would keep daily logs of three good things they expect to happen tomorrow, and what they could do to make it more likely that these things will indeed happen. Whereas the original exercise targets pessimistic explanatory style, the reformulated exercise targets pessimistic predictive style. Of course, no one can ensure that good things will happen; even the most likely outcomes and the most realistic goals can be unexpectedly blocked. This *three good things tomorrow* exercise could prove useless or even harmful if it were to set up fragile expectations and frequent disappointment. To mitigate these risks, the exercise can also include writing down three ways to manage if the good things one expects do not actually happen; these could include coping strategies (e.g., call my sister, exercise, pray) and/or alternative routes towards a goal (e.g., consult with my old boss about other opportunities).

#### *Strengths-based work*

Even after depressed people learn to vividly simulate positive futures, they may still refuse to believe these could actually happen to them. One way to make positive simulations feel personally relevant is to help clients discover their strengths as in positive psychotherapy and solution-focused therapy (O'Connell, 2012; Seligman *et al.*, 2006): When clients identify and develop what is good about themselves, they may feel that positive outcomes are both more attainable and more deserved. They can also simulate using their strengths to pursue meaningful goals. Recent developments in strengths-based CBT are promising (Padesky & Mooney, 2012).

*Building purpose*

Meaning and purpose are integral parts of psychological well-being, and they may buffer against despair and suicide (Lester, Harms, Bulling, Herian, & Spain, 2011; Ryff & Keyes, 1995; Seligman, 2012). Although the terms are sometimes used interchangeably, purpose differs from meaning in being more future-directed: Purpose is about the intention to accomplish something important, a 'central, self-organizing life aim that organizes and stimulates goals, manages behaviours, and provides a sense of meaning. . . [and] directs life goals and daily decisions' (Damon, Menon, & Cotton Bronk, 2003; McKnight & Kashdan, 2009, p. 242). Meaning and purpose fit very well within a prospection-based CBT intervention.

How can CBT build purpose? First, it can help clients clarify their highest values and chart a course towards them as in acceptance and commitment therapy, a third-wave CBT approach (Hayes, Strosahl, & Wilson, 1999). Second, clients can be guided in taking on *personal projects* and pursuing them over time to attain a valued outcome (Little, 1983); such projects may help depressed clients to be drawn into a meaningful future and not be mired in a dark past. Third, CBT therapists could use a new technique we call the *forward arrow* technique. This is inspired by the classic CBT *downward arrow* technique (Burns, 1980; Friedman & Thase, 2006) in which the therapist drills down to the core fear underlying a client's distress (e.g., 'I'll die alone and unloved, which will mean that my life was a failure'). The forward arrow technique uses similar methods towards a different end: The therapist elicits a positive scenario and then asks the client what exactly makes this scenario so fulfilling. This questioning is repeated until the client arrives at the core purpose that draws him into the future (e.g., 'Then I would know that I had really made my family happy and made the world better for future generations'). The therapist can then use this positive vision to help propel the client through obstacles, as in ACT and motivational interviewing (Rollnick & Miller, 1995). This positive vision could also combat depressed people's tendency to set fewer approach goals, more avoidance goals, and to pursue approach goals for avoidance-related reasons (e.g., to earn a promotion so that one's family will not be disappointed) (Dickson & MacLeod, 2004; Sherratt & MacLeod, 2013; Vergara & Roberts, 2011).

### **Part III: Limitations and future directions**

Prospection gone awry may be relevant, even central, to a number of other disorders. This special issue is indeed devoted to this possibility, so we will leave it to others in this issue to elaborate. Importantly all of these approaches can be thought of as *transdiagnostic*. Transdiagnostic approaches assess and target the core underlying processes that produce and maintain pathology (Forgeard *et al.*, 2011; Harvey *et al.*, 2004; Mansell *et al.*, 2009). These processes span traditional diagnostic boundaries; two disorders can manifest in different symptoms and yet be driven by the same fundamental problem. We have argued that faulty prospection is the fundamental problem driving depression. Faulty prospection may also undergird a diverse range of psychopathologies, including bipolar disorder (Johnson, 2005) and substance use disorders (Bickel & Marsch, 2001). If this is so, clinicians should identify and repair faulty prospection (a core process) rather than just identifying and repairing symptom clusters.



**Shortcomings of the prospective framework**

The prospective framework has limitations related to several unanswered questions: (1) What really is the evidence for a causal link between prospection and depression? (2) What are the risks of emphasizing prospection? (3) What is the role of negative self-concept in depression?

*What is the evidence for a causal link?*

The research we have reviewed here clearly points to a strong association between prospective processes and depression. We posit that the link is causal, and longitudinal studies hint that this is the case (e.g., Andersson *et al.*, 2013; Carver & Gaines, 1987; Rholes, Riskind, & Neville, 1985), but more empirical work is needed to directly test this. In addition, more research is needed to determine whether prospection plays the same role in major depressive disorder and in the milder dysphoria of non-clinical samples (a distinction we have not made in summarizing and interpreting the literature cited here).

*What are the risks of emphasizing prospection?*

Prospection is generally adaptive for emotion-regulation and problem-solving (Seligman *et al.*, 2013; Taylor *et al.*, 1998). But can it become too much of a good thing? Is it possible to be excessively future-minded, and devote too little attention to the past and present? Intense future-directedness might lead people to miss out on savouring the present moment, benefiting from reminiscence, or enjoying flow (Bohlmeijer, Smit, & Cuijpers, 2003; Csikszentmihalyi, 1988; Quoidbach, Berry, Hansenne, & Mikolajczak, 2010; Wong & Watt, 1991). This is a matter for future research.

Likewise, positive prospection (e.g., optimism) carries its own risks. Negative prospection is often adaptive (Miloyan *et al.*, 2015; Norem & Chang, 2002), and therapists would do depressed people a disservice if they set up untenable positive expectations, given life's inevitable sorrows both great and small. So while it is indeed useful to help depressed people change their overblown negative expectations and fight against the pull of hopelessness, this is not the whole picture; it is also important to help such people become less reactive to disappointment and learn to 'cope ahead' (Linehan, 2014) – as well as to set meaningful goals, visualize multiple routes towards these goals, and make good judgments and decisions. In short, visualizing and expecting good things is not enough.

Future research should examine the relative merits of present-focused and future-focused treatment approaches. The concept of mindfulness (an accepting awareness of present experience) has become more popular, and there is a growing body of evidence to support therapies linked to mindfulness: For instance, present-centred therapy for PTSD, acceptance and commitment therapy for mixed anxiety and depression, and mindfulness-based cognitive therapy for depression (Classen, Butler, & Spiegel, 2001; Hayes, Luoma, Bond, Masuda, & Lillis, 2006; Segal, Williams, & Teasdale, 2012). More research is needed to understand (1) the relative benefits and risks of prospective techniques versus present-centred techniques, and (2) to what extent present-centred and mindfulness-based therapies actually work by correcting faulty prospection (for instance, by helping people to disengage from catastrophic thoughts about the future).

*What is the role of negative self-concept? Despair versus depression*

We have suggested that a negative view of the future is more important than a negative view of the self in driving depression. We certainly recognize that negative self-concept is highly relevant, however, and we wish to explore the possibility that it might even be a necessary condition of depression. To highlight the conceptual issues at play, consider a concentration camp prisoner. He might have a negative view of the world and a negative view of the future, but as an unjustly imprisoned victim and a virtuous person, he might have quite a positive view of himself. What follows? Despair certainly may follow, but does depression? For Beck (1974), the negative view of the self is necessary and despair, when rational, does not equal depression, nor is despair a disorder. On the other hand, the reformulated hopelessness theory of depression does not require internal attributions and despair counts as depression (Abramson *et al.*, 1989).

One possible resolution is that the self is a particularly long-lasting and relevant subset of the future and nothing more. To appreciate this, contrast a negative view of the world to a negative view of the self. A negative view of the world is of almost no moment to depression *if one also believes that the world will get much better tomorrow*. A negative view of the world, then, can be subsumed by a negative view of the future, as it matters most for depression if it projected long into the future. Hence, within the prospective framework, we can dispense with a negative view of the world, leaving only a dyad (the future and the self, but not the world) to account for depression.

But can the negative view of the self also be dispensed with? The self (unlike the weather) is a robustly stable factor and projects far into the future; self-concept is a stable, multifaceted, organized perception of *who I am* (Shavelson, Hubner, & Stanton, 1976) – and thus, of who I will be. Indeed, stability is so important to us that we may seek out negative rather than positive feedback if it allows us to maintain a stable view of the self (Swann, Griffin, Predmore, & Gaines, 1987; Swann & Read, 1981). It is possible, then, that the self only matters for depression insofar as it portends a bad future. If an individual believed that he/she was unlovable, but only for today, this would not be so discouraging; the thought ‘I am unlovable’ is distressing because it implies ‘no one will *ever* love me’. On the other hand, self-concept may matter beyond its implications for the future; the active role of self might be moral as opposed to merely predictive – hence guilt, and anger turned inward (Freud, 1917). Even if a person believed he could redeem himself in the future, he might nevertheless feel intense distress and guilt over bad deeds done in the past, which could feed depression.

This is an empirical issue as well as a conceptual issue. Does despair without self-blame produce the same symptoms with the same intensity? Does partialling stability out of internality remove the negative view of self as a risk factor for depression? Does eliminating a negative view of the future in therapy, without targeting a negative view of the self, relieve depression? We encourage innovative research on these important questions.

**Future directions**

We hypothesize that when CBT (or therapy generally) is oriented towards prospective thoughts, it better relieves depression. Careful clinical research can begin to uncover whether this is true. There are several priorities for such research. First, researchers need to identify the qualities of ‘good’ prospection. For instance, when it comes to resisting depression, these qualities may include flexibility, vividness, fluency, overall accuracy, and a slight overestimation of positive possibilities. These qualities are unlikely to be

universally beneficial, however. For example, for resisting mania, individuals may need to remind themselves of negative possibilities ('my partner will be furious if I blow thousands of dollars on a whim') and not overestimate positive possibilities ('maybe I'll strike it big at the casino!'). Similarly, prospection that protects against depression may differ from prospection that promotes overall well-being.

A second priority for research is measurement. More work is needed to determine how much time depressed people actually spend thinking about the past, present, and future – and how much they should spend. Some research hints that depressed people may be less future-oriented (e.g., Breier-Williford & Bramlett, 1995), but measurement is not yet adequate: Existing self-report measures of future-orientation include items tapping self-regulation, conscientiousness, optimism, and hope, and they also do not clearly differentiate between a positive future versus a negative future (Hirsch *et al.*, 2006; Zimbardo & Boyd, 1999). With advances in measurement, we can better answer key questions: Does the sheer amount of future-directed thinking (compared to past- or present-directed thinking) predict treatment outcome? Does the balance of positive versus negative future-thinking predict treatment outcome? Researchers should also examine the impact of therapists' use of future-oriented language. When therapists focus more on the future, rather than the past or present, does this enhance treatment outcomes? These questions can be approached using sophisticated new methods of language analysis (e.g., Schwartz *et al.*, 2013), which use machine learning models to detect patterns of temporal orientation in texts such as therapy transcripts.

A third priority is to determine whether recovery depends on fixing distortions versus fixing prospections. Traditionally, cognitive therapists help clients to change distorted thoughts: 'I am a bad mother' becomes 'I am a mother with strengths and weaknesses, like any other'. Is it possible to dispense with fixing distortion and simply fix prospection? Can the therapist move directly to the topic of how to be a good mother tomorrow? It is important to test whether treatment progress is caused by more accurate thinking generally, by more positive prospective thoughts, or both.

Fourth, randomized controlled trials are needed to test the efficacy of prospective treatment methods. In particular, clinical trials should compare prospection-based CBT to more traditional cognitive therapy and to behavioural activation to determine whether it is indeed superior. In general, such clinical trials of prospection-based CBT should measure three types of outcomes: Symptoms, overall functioning, and well-being. It may be that some residual symptoms remain after treatment with prospective CBT, but that clients are better able to handle these symptoms and engage in meaningful lives in spite of them.

In conclusion, prospection belongs front and centre in the study of depression. Empirical work is needed to determine whether faulty prospection drives depression, and how prospection can be improved. We encourage clinical scientists to invest in research on prospection to shed more light on a crucial and under-appreciated transdiagnostic process that may underlie much more than depression. An understanding of how prospection shapes psychopathology may enable researchers to create more effective treatments and help distressed individuals to create brighter futures.

## **Acknowledgements**

This publication was made possible through the support of a grant from the John Templeton Foundation. The opinions expressed in this publication are those of the authors and do not necessarily reflect the views of the John Templeton Foundation. The authors also gratefully

acknowledge Dianne Chambless, Angela Duckworth, and Grace Cormier, who provided valuable feedback about this work.

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Received 6 August 2014; revised version received 17 April 2015