Conceptual blending theory and psychiatry

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Abstract

Conceptual blending has been proposed as a model for a variety of cognitive phenomena, and has the potential to contribute to our theoretical understanding of psychopathology. For example, from the perspective of conceptual blending theory, delusions are the product of conceptual integration processes similar to those present in many normal cognitive functions; however, there is aberrant selection of an input space, resulting in blends with relations that would normally be regarded as unfounded. Similarly, chronic interpersonal difficulties can be viewed as the repetitive application of a particular input-space frame to the construction of blends. Future research could examine whether this framework can be applied more generally to other psychiatric disorders, and whether the explicit reconstruction and examination of conceptual integration networks can be useful as a psychotherapeutic technique.

Introduction

Since its inception, conceptual blending theory has been proposed as a model for a variety of cognitive activities. In conceptual blending, elements from different mental spaces are aligned with one another as well as selectively projected to a blended space, yielding emergent meaning (Fauconnier & Turner, 1998). Conceptual blending has been postulated as a general principle underlying the construction of meaning in a range of mental phenomena of different complexity. As described comprehensively by Gilles Fauconnier and Mark Turner (2002) in The Way We Think, such phenomena include relatively simple linguistic constructions like the sentence Tom is my father; as well as more complex operations used in metaphor, analogical problem-solving, scientific creativity, literature, ritual, and humor.

Conceptual blending theory is predicated on the existence of different mental spaces, each comprising a set of interrelated elements that can be activated as a unit. An example of an extremely simple mental space with minimal interrelation between the elements would be one consisting of two people (e.g. Jane and Robert) with no specified relation between them. An example of a mental space whose elements are related in a specific organization or frame would be one in which Julie buys coffee at Peet's Coffee Shop (from Fauconnier & Turner, 2002). Its elements include Julie, the

coffee shop, a cup of coffee, a salesperson, money, and so on. The frame specifies interrelations among these elements, e.g. that the salesperson gives the cup of coffee to Julie, that Julie gives money to the salesperson, and so on.

The process of conceptual blending involves the construction of relations between several different mental spaces in a conceptual integration network. These mental spaces include two or more input spaces, a generic space, and a blended space (the blended space can also be referred to simply as the blend). Elements in the generic space each map to an element in each of the input spaces, and represent what the input spaces have in common. In addition, selective mapping between elements across input spaces occurs, along with selective projection of elements from input spaces to the blended space. By establishing relationships between elements in different spaces, these processes create emergent meaning.

So far, there has been relatively little examination of how psychiatric problems might be viewed within the framework of conceptual blending theory. As an example of blending, Fauconnier and Turner (2002) cite the phenomenon of "lottery depression," in which holders of lottery tickets become depressed after losing, even though they acknowledge that the odds of winning were minute. This exemplifies the construction of a blend representing an imagined or counterfactual situation, in which the individual wins the lottery (with input spaces corresponding to the individual's actual situation, and to that of a prototypical lottery winner), with further elaboration of the blend by addition of imagined objects that the individual would acquire. Apparently, some individuals invested so much emotional energy in this counterfactual blend that they became depressed when they learned that it would not come true, feeling as if they had "lost" the fantasy objects they had acquired. Fauconnier and Turner (2002) also cite the example of anosognosia, a syndrome in which individuals acquire a neurological deficit but have no conscious awareness of it, as when a stroke patient with a paralyzed left arm is unaware of the paralysis, and gives other explanations for why she is not moving it which are false but which she consciously believes. This can be seen as another example of a counterfactual blend, but one that has taken on a character that the patient experiences as fully real.

Further examination of psychiatric problems from the perspective of conceptual blending theory could potentially contribute to our theoretical understanding of the cognitive abnormalities that lead to particular symptoms, and inform our efforts to treat them. In addition, if psychiatric disorders can be described in terms of abnormalities of conceptual blending, this would help support the ecological validity of this theoretical model, and could add to our knowledge of the empirical principles that govern which particular blends (out of all possible ones) people do or do not construct in different situations. The purpose of this article is to apply conceptual blending theory in an exploratory manner toward the analysis of two selected examples of psychiatric symptoms: delusions and chronic interpersonal difficulties.

Delusions as Conceptual Blends

One common psychiatric symptom, seen in a variety of disorders, is the delusion. Delusions have been defined as beliefs that are false, not accounted for by the patient's cultural background, and fixed (i.e. the patient does not consider any alternative interpretations as possible) (Kaplan & Sadock, 1998). Delusions can develop in different disorders, including primary psychotic disorders like schizophrenia or delusional disorder, mood syndromes like depression or mania, and

delirium due to medical causes or substance intoxication. Thus, analogous to a physical symptom like fever, delusions are regarded not as having a single possible cause, but rather as being the final common pathway of a range of underlying pathophysiologies. The content of delusions is also to some extent characteristic of the particular disorder causing them - for example, a belief that one is Jesus Christ would be most typical of mania, a delusion that all one's money has been taken away as punishment for a bad deed in the past would be characteristic of depression, and a delusion that one's thoughts or actions are being controlled by an external force (e.g. an implanted microchip receiving signals from the CIA) would be characteristic of schizophrenia.

To look more closely at delusional thinking from the perspective of conceptual blending, let us examine an example of such a case, one of delusional disorder of the paranoid type (described in detail in Spitzer, Gibbon, Skodol, Williams, and First (1994)). In this case, a 42-year-old married postal worker and father of two, with no previous history of any psychiatric problems, is brought to the emergency room by his wife because he has been insisting "there is a contract out on my life." According to the patient, four months previously, his supervisor wrongly accused him of tampering with a package. The patient appealed and was exonerated in a hearing. Two weeks later, the patient began to notice that when he approached co-workers, "they'd just turn away like they didn't want to see me." He then became sure that they were talking about him behind his back, and that all this was because his supervisor had taken out a contract on the patient's life, because the supervisor was "furious" that he had been "publicly humiliated." The patient then began noticing unfamiliar "large white cars" repeatedly driving up and down his street, became convinced that these cars contained "hit men" seeking to kill him, and became terrified.

The paranoid ideation in this case can be seen as involving the construction of new conceptual blends. These are double-scope blends (Fauconnier & Turner, 2002), containing input spaces with different organizing frames, and a blended space with its own organizing frame that draws structure from each of the input frames, yielding emergent structure. One input space (which we will term the thematic input space) has a frame incorporating the theme of the delusion, and another input space (the situational input space) includes elements of the patient's actual experience. Figure 1 schematically illustrates the conceptual integration network for the case presented above. The thematic space on the left has a frame in which hit men drive cars along the street where their quarry lives, intending to kill him for their boss. The situational input space on the right contains elements from the patient's experience - himself, his supervisor, and white cars which he has apparently seen driven repeatedly up and down the street where he lives. The generic space includes elements common to both input spaces - in this case, the presence of cars driven on a street on which a person lives. In constructing the network, the patient has made selective alignments between elements in the two input spaces - for example, mapping the apparently observed drivers and their cars to hit men and their cars, his supervisor to the hit men's boss, and himself to the hit men's target. Both members of each mapped pair are then projected to the same element in the blended space, so that in the blended space, the drivers whom the patient has seen become hit men, the patient's supervisor becomes the hit men's boss, and the patient becomes the intended victim. In addition, each input space has some elements or relations that have no counterpart in the other space, but are projected into the blended space, yielding emergent meaning in the

overall blend. For example, the relation between the hit men and their victim in the thematic space is that they intend to kill him. In the situational space, there is no such relation between the drivers and the patient - the white cars could conceivably be limousines that take this street to get to the airport, or belong to neighbors living on the street. Similarly, the relation between the hit men and their boss in the thematic space is that the boss has hired the hit men to kill the target, whereas in the real situation no such relation exists between the patient's supervisor and the drivers of the cars. Thus, relations from the thematic space are projected to, and lend their structure to, the blended space, adding organizing (but erroneous) meaning to elements projected from the situational space. Meanwhile, in the situational space, the cars' characteristics of being white and of being seen to drive up and down the street repeatedly, as well as the workplace relationship between the patient and his supervisor, are properties not specified in the thematic space. Thus, in the blend, the hit men have a predilection for white cars, and drive them up and down the street repeatedly without actually killing the patient, and the hit men's boss is targeting his subordinate in the workplace – emergent characteristics not present in a stereotypical "hit man" frame.
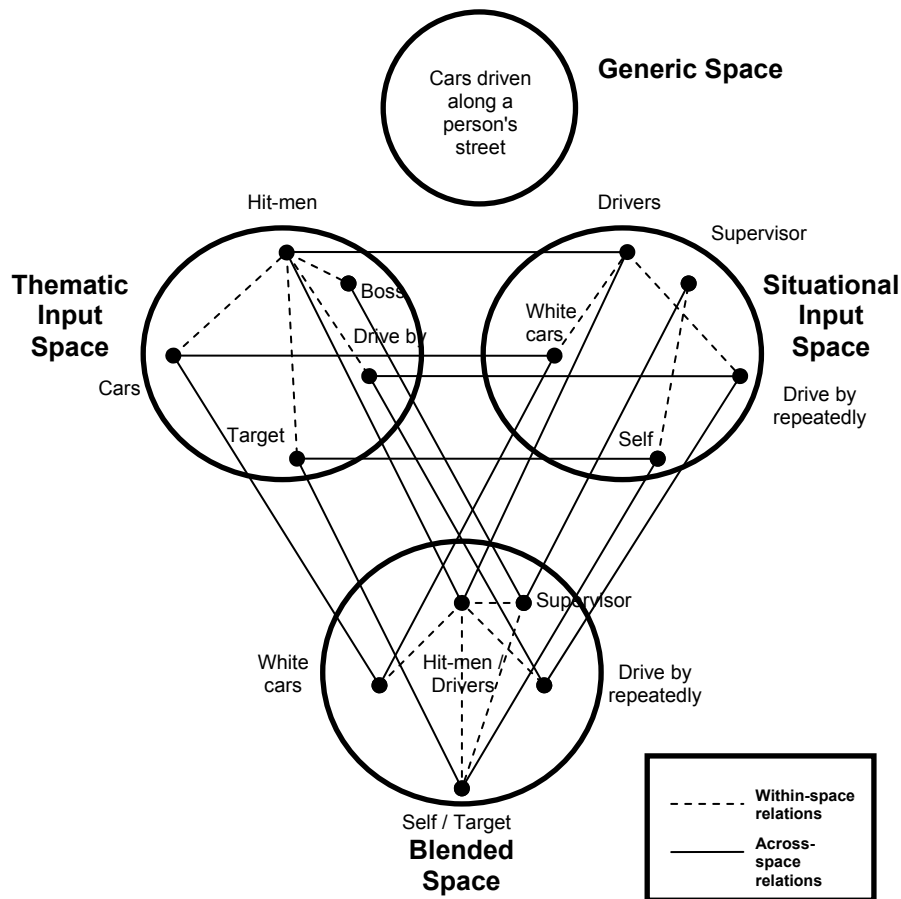

Figure 1. Blending diagram of hit man scene

In general, then, delusions can be seen as the product of the same kind of conceptual integration processes present in many normal cognitive capacities like analogy,

creativity, and metaphor; it is the selection of input spaces that is aberrant, resulting in blends with relations that would normally be regarded as unfounded. In the above example, the blend depends on the establishment of mappings between elements in the "hit man" thematic input space and the situational input space containing objects or events seen by the patient. To a normal individual, however, there is no evidence to support these alignments as appropriate. According to Fauconnier and Turner (2002), two of the principles governing the construction of blends are the need to maximize topological connections between mental spaces, and the need to maintain appropriateness of these connections. These two principles can oppose each other in a given situation, requiring the individual to find a blend that compromises by satisfying both to some degree. In the anosognosia example, the cross-space mapping between the patient and a person who can move her arm is seen by others as pathological because they see evidence to contradict it; thus, in this case topology is maximized at the expense of appropriateness. In contrast, Fauconnier and Turner's (2002) "Hide the Penny" example, in which a woman draws a parallel between her brother's present relationship difficulties and his childhood behavior, the mapping between the childhood and adult actions is seen as appropriate because of our belief that people's behavior patterns persist over time; however, in a hypothetical culture where there was no such belief, the mapping would be seen as unfounded. Thus, delusions are characterized not by an inability to construct conceptual blends, but rather by the selection of inappropriate combinations of inputs for these blends.

Although conceptual blending theory offers a characterization of the cognitive abnormality in delusions - namely, the inappropriate selection of input spaces for conceptual integration, it can not explain why a specific type of frame tends to be consistently overselected as thematic space in a particular illness. For example, it would be characteristic of a manic patient with grandiose delusions to believe that white cars repeatedly driving by his home contained spies seeking to kidnap him to find out the secret behind his special powers, while a woman with an erotomanic delusional disorder would be apt to believe that such cars contained a prominent person who was secretly in love with her and wanted to catch a glimpse of her. Conversely, although an unlimited number of thematic frames are possible, many of these are not seen empirically in delusions. For example, it would be unusual in any psychiatric disorder for a patient to develop a belief that he is a non-human animal or an inanimate object (such that, upon encountering a patient who said this, one would likely question whether he was feigning illness). As stated by Fauconnier and Turner (2002):

> What counts as a 'natural' match will depend absolutely on what is currently activated in the brain. Some of these activations come from real-world forces that impinge on us…others from bodily states…and many others from internal configurations of our brains acquired through personal biography, culture, and, ultimately from biological evolution.

A framework for further research is to explore the factors - whether biological, psychological, environmental, or a combination thereof – that determine why delusions in different disorders are characterized by the activation of particular thematic-space frames.

Conceptual blending theory does postulate, however, that, for blends in general, once their particular input frames are activated, the binding of elements in the subsequent conceptual integration network is often unconscious and can be very entrenched. The

processes involved in constructing the blend "operate for the most part automatically and below the horizon of conscious observation" which "makes the detection of biases difficult" (Fauconnier & Turner, 1998). This is consistent with the observation that delusions are relatively impervious to conscious questioning, whether by the individual herself, or in challenges from others. One factor contributing to this robustness of blends, including delusions, appears to be the rewarding sense of insight that they appear to engender. Achieving the topological alignments in a blend seems to "give us the feeling that 'one thing' is giving us insight into 'another thing'…strong emotions emergent in the blend can induce the feeling of global insight, because the highly compressed blend remains actively connected to the entire network" (Fauconnier & Turner, 2002). It also appears that maximizing the number of alignments can increase this feeling of insight, as long as the individual considers them appropriate. This process can be seen in the elaboration of blends, in which additional aligned elements are recruited, with this pattern completion contributing to the feeling of understanding. Thus, in the Hit Men example, the patient might next see the driver of a car talking on a cell phone, and then believe in addition that this "hit man" must be communicating with an associate in order to co-ordinate the hit. From an evolutionary point of view, a feeling of insight, security or certainty triggered by the elaboration of blends might be adaptive, since our evolutionary ancestors encountered situations where they needed to be able to recognize and complete patterns quickly in order to survive. For instance, if they perceived a large object moving quickly toward them in the dark, the most adaptive response would be to assume that this was a predator and to flee, even if this assumption might not be correct.

The role of this sense of insight in the formation and maintenance of conceptual blends is consistent with some existing theories of delusion formation. According to one theory of delusion formation in schizophrenia, the primary abnormality is one of dysregulated dopaminergic transmission which causes environmental stimuli to develop an abnormally salient character (Kapur, 2003). This theory is based on phenomenological observations in which schizophrenia patients report that, immediately before becoming delusional, they experienced a state in which normally unremarkable stimuli took on an unusually salient character, seeming to hold some strange but unknown significance. Thus, Sullivan (1994/1927) describes how "all sorts of trifling and wholly unrelated occurrences seemed fraught with great personal import, to bear in some signal but incomprehensible way upon him." This abnormal salience is also reflected in patients' own words: "It was as if parts of my brain awoke which had been dormant...I became interested in a wide assortment of people, events, places, and ideas which normally would make no impression on me" (Bowers & Freedman, 1966); or "my senses seemed alive, colors were very bright, they hit me harder...I noticed things I had never noticed before" (Bowers, 1968). Schneider (1959) described a patient with schizophrenia who attributed strange significance to a dog he had seen:

A dog lay in wait for me as he sat on the steps of a Catholic convent. He got up on his hindlegs and looked at me seriously. He then saluted with his front paw as I approached him. Another man was a little way in front of me. I caught up to him hurriedly and asked if the dog had saluted him too. An astonished 'no' told me I had to deal with a revelation addressed to me.

The strange sense of significance leaves patients perplexed and seeking some kind of explanation for it - e.g. "I was really groping to understand what was going on"

(Bowers, 1968). Kapur (2003) proposes that delusions are a "top-down" cognitive explanation that the individual then imposes upon these experiences in an effort to make sense of them. Delusions are thus to some extent imbued with the individual's particular personal history, psychodynamic themes and cultural context, so that within schizophrenia, one patient might attribute experiences caused by aberrant salience to the evil ministrations of a shaman, and another to technological machinations by the CIA. Once the patient arrives at such an explanation, though erroneous, it provides a "psychotic insight" which relieves her previous sense of uncertainty (Bowers & Freedman, 1966; Roberts, 1992). In terms of conceptual blending theory, in this model of delusion formation, the patient constructs new conceptual blends to explain the strange aberrant salience of stimuli. The patient's individual psychodynamics constrain the elements selected for the thematic input space, and hence the specific subject matter of her delusions. The reinforcing sense of insight gained by completing the blend might explain why delusions are so resistant to psychotherapy or rational challenge by others. An open question is whether this model of delusion formation - in which aberrant salience of stimuli is the primary cause, and the construction of explanatory blends is secondary – is generalizable to other disorders involving delusions, or whether some of these disorders may involve an overactive input frame as the primary pathology.

Conceptual blending and interpersonal difficulties

A different type of psychiatric problem to which conceptual blending theory might be fruitfully applied is that of interpersonal difficulties customarily treated with psychotherapy. Unlike delusions, which typically arise acutely in a previously normal individual, are believed to result from an illness state, and are treated most effectively by pharmacotherapy, these interpersonal difficulties tend to be chronic and are thought to result from the patient's personality development. Mitchell and Black (1995) describe a typical case, that of Emily, a professionally successful young woman.

> Emily came to treatment because of her difficulties in establishing satisfying relationship with other people, both men and women. She tended to put people off for reasons she did not understand; she found herself irritated and impatient with others. She tended to feel that in most of her activities - in her work, around her house, sexually in her bed - she could do it better by herself than relying on others. She was so good at what she did that the wisdom of this approach seemed to be substantiated again and again.

Over the course of psychotherapy, the therapist began to consistently feel that Emily was subtly dismissive of his efforts to help her.

> He became increasingly aware that he always felt he was interrupting something he perhaps should be staying out of…Emily at first…rejected this observation, as if to reassure the analyst that his efforts were appreciated. Eventually Emily was able to reflect more fully…On the one hand, she came for treatment because she knew she needed help and felt a great regard for the analyst's professional abilities. On the other hand…she did feel that she had been thrown off the track whenever the analyst spoke…it meant she had to deal with him, his thoughts, which could only be a distraction from…her own sense of where she needed to go.

It then came to light that during her childhood Emily perceived her father, a businessman, as self-absorbed and having little time for his children. He treated her mother as "imbecilic and incompetent," and her mother in turn "continually turned to Emily tearfully for reassurance." Thus, "neither parent seemed capable of attending to Emily's needs; they broke into her world only when they needed something from her."

A psychodynamic formulation of this case might draw parallels between the interpersonal dynamics of Emily's childhood world and her current interactions with others, including with her therapist. Thus, her preconception of others as being unreliable and self-absorbed, learned from her childhood experiences, have led her to approach current situations with the priority of maintaining independence or control, at the expense of strengthening interpersonal relationships which would benefit her in the long run.

In terms of conceptual blending theory, the way Emily approaches her current relationships can be seen as the repetitive creation of a particular kind of double-scope blend, containing a recurring thematic input space whose elements she has learned over the course of her personal developmental history, and a situational input space whose elements vary depending on the current interpersonal situation in question. As shown in Figure 2, the thematic input space includes herself as a child, and her parent when she was a child. The elements in the situational input space include Emily and another person with whom she interacts in the present (in this example, the therapist), and these are both projected into the blended space. The mapping between herself in the present and herself as a child involves an across-space identity relation between two different entities - herself at different times. The frame in the thematic space also contains another type of element – aspects of her parent, such as unreliability or self-absorption. These are projected to the blended space, so that these aspects are connected to the therapist.

This type of blend shares similarities with the blend that we proposed as a model for delusions. In both cases, the frame in the thematic space varies from one patient to another. Its qualitative character cannot be predicted by conceptual blending theory, but depends to varying degrees on the individual's personal history, biology or temperament. Nevertheless, it can be seen empirically that once a particular type of thematic-space frame becomes activated in an individual, it tends to be applied recurrently to different focuses, and the resulting integration networks are usually quite entrenched and not immediately conscious to introspection.

One difference between this blend and the delusion blend is that the latter contains a greater number of inappropriate projections. In the Hit Men example, the hit men and the drivers from different input spaces are projected to the same element in the blended space, leading to an identity compression, so that the patient believes that the drivers are actually hit men. An analogous process occurs for the patient and the intended victim, so that the patient believes he is actually a target of hit men. On the other hand, in the case of Emily, although there is an analogy mapping across input spaces between present-day Emily and Emily as a child, or between the parent and the therapist, only one of each pair is projected to the blended space. In other words, Emily does not actually believe that the therapist is really her parent, or that she is simultaneously both herself and herself as a child. Thus we can see that the

delusional individual, as compared to the neurotic individual, is increasing topology to a greater degree, at the expense of appropriateness.
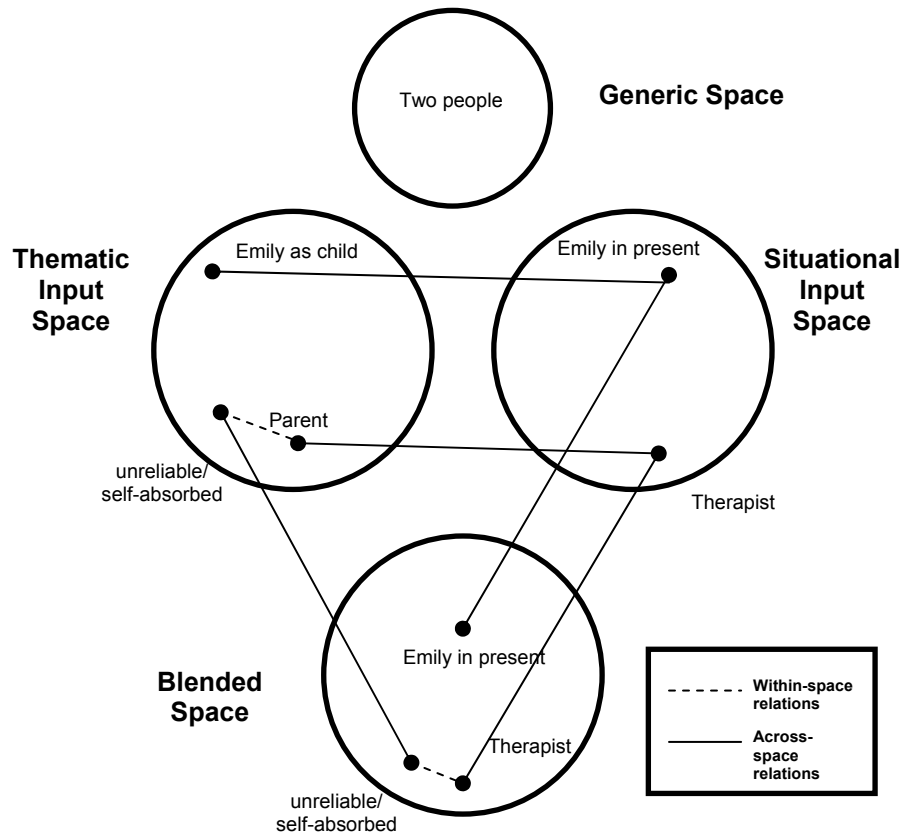

Figure 2. Blending diagram of Emily

Another contrast between the two blends is that in the chronic interpersonal problem the thematic input space is comprised of elements from the patient's childhood, whereas in the delusion, the thematic input space has elements generally characteristic of the illness rather than reflective of the patient's specific past experiences. This reflects the view that Emily's dysfunctional cognitive schema recapitulates conflicts from her early life, whereas that of the postal worker is a more generic one determined primarily by his biological illness. This comparison also highlights how the elements we, as theoreticians, choose to incorporate in the thematic input space when modeling psychopathology with a blend depend on our formulation of the etiology of the symptoms. Thus, in the case of the postal worker, an author who believed that the structure of the delusion was determined primarily by childhood interpersonal experiences might instead construct the thematic input space with elements from the patient's early life. Alternatively, since a conceptual blend can have more than two input spaces (Fauconnier & Turner, 2002), it could also reflect a formulation in which developmental experiences and a biologically-driven schema both contribute to the delusion, by representing each of these two frames with a separate thematic input space.

Perspectives on treatment

Although it appears that conceptual blending theory may help us better characterize the cognitive processes in psychiatric problems, to what extent can it inform our approach to treating them? In the case of delusions, blending theory may not be directly applicable to how one interacts with a patient, since - despite some reports of the efficacy of cognitive-behavioural therapy for delusions in a subset of patients (Rector & Beck, 2001) - psychotherapy has not in general been found to be effective in changing delusions, and pharmacotherapy is the treatment of choice. From the perspective of blending theory, some aspect of the pathogenesis of delusions limits the patient's conscious apprehension of the blended space, so that the patient while ill can only, in the words of Fauconnier & Turner (2000), "live in the blend" and is incapable of living "in the full integration network." It is unlikely that attempts to help the delusional patient achieve insight into the existence of the full integration network would be successful. In the case of interpersonal problems, however, psychotherapy is considered potentially effective, and thus conceptual blending theory could perhaps be applied toward refining the current repertoire of psychotherapeutic techniques.

Two different psychotherapeutic approaches in common use include psychodynamic therapy, and cognitive-behavioural therapy. One goal of psychodynamic therapy - used for example in the case of Emily described earlier (Mitchell & Black, 1995) - is for the patient to achieve understanding into how she manifests similar patterns of cognitions and behaviours across a range of interpersonal situations, including with the therapist, and to relate these patterns to historical situations in the patient's development that are believed to have contributed to these patterns (e.g. Book, 1998). Somewhat differently, cognitive-behavioural therapy focuses on identifying the "automatic" or barely conscious thoughts that the patient experiences in present-day situations, and the distorted assumptions that underlie these thoughts (Beck, 1995). The therapist aims to help the patient identify empirical evidence contradicting these assumptions, sometimes through assigned experiments designed to test them. The patient is also asked to come up with alternative thoughts or assumptions and to test their validity. Unlike in psychodynamic therapy, the genesis of distorted assumptions in childhood experiences is not an essential focus in cognitive-behavioural therapy, and is generally explored relatively late in the therapy, if at all, depending on the patient's apparent degree of access to these experiences and acceptance of their relevance.

It appears that implicit in the process and goals of psychodynamic therapy is insight into the "full integration network" which has previously not been fully conscious. From the perspective of conceptual blending theory, the essential goal of understanding how certain properties of childhood figures are repeatedly projected onto present-day ones can be viewed as the achievement of insight into how a particular thematic input space is repeatedly used in constructing blends. The patient comes to understand how persons from a situational space and properties from a thematic space are projected into the blended space, to construct an emergent stereotyped meaning that may lead the patient to respond in a self-defeating way.

In contrast, insight into the full integration network is not a crucial part of cognitive-behavioural therapy, where the emphasis is limited mainly to identifying the elements of the blended space. For example, if used with Emily, cognitive-behavioural therapy would primarily focus on how, across different situations, the blended spaces she

constructs consistently involve the compression of a person with the properties "self-absorbed" or "unreliable." The therapy would then examine evidence for or against the appropriateness of this compression. In addition, the development and testing of alternative thoughts and assumptions would involve the conscious construction of alternative blended spaces - ones in which different properties like "caring" or "considerate" are attached to the other person instead. The therapy, however, would generally focus on the blended spaces, as opposed to examining elements and their relations in the rest of the conceptual integration networks to which the blended spaces belong. Whether or not examining the network outside the blended space has any differential effect on the outcomes of cognitive-behavioral therapy is a potential question for empirical clinical study.

In psychotherapy, conceptual blending theory could potentially be used even more explicitly than in current methods of psychodynamic therapy. The therapy might then involve reconstructing, from the clinical data, the characteristic type of conceptual integration network that the patient appears to be activating that is responsible for their presenting difficulties. This would involve identification of the elements of the input and blended spaces, and the interrelations between them. The therapy would aim at achieving insight into these components of the network, and how they are activated repeatedly across different situations. Clinical studies could then test the effectiveness of this approach in achieving subjective and behavioural change.

Conclusions

The examples presented here suggest that conceptual blending theory can provide a useful framework for understanding the cognitive processes involved in different classes of psychopathological symptoms. Both delusions and chronic interpersonal difficulties involve the application of a characteristic type of input-space frame to the construction of conceptual blends, while the actual processes involved in constructing the blend are similar to those used in many normal cognitive activities. Patients often appear to have little or no insight into the processes involved in constructing these pathological blends, which is consistent with the resistance to conscious apprehension that has been noted for many other types of conceptual blends. A framework for further research is to examine whether conceptual blending theory can provide a general framework for understanding symptoms across the spectrum of psychiatric disorders. In terms of this model, future work can elucidate how biological, psychological and cultural factors determine the particular thematic-space frames that tend to be activated in specific disorders or particular individuals. Future research could also evaluate whether, and in what circumstances, the explicit reconstruction and examination of conceptual integration networks might be useful as a psychotherapeutic technique.

Acknowledgements

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