# A Critical View on Conceptual Blending Theory

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### Abstract

This study addresses conceptual blending theory, originated by J. Fauconnier and M. Turner. The author raises some criticism of the theory's underpinnings and methodology. Particularly, he points at the lack of cultural-historical analysis and the neglect of experimental data as the shortcomings of the theory as stated. It is shown in the paper that the view on blending as an important tool to adapt knowledge to the experience of average people is more correct than its interpretation as a basic instrument for the creation of new knowledge.

**Keywords:** conceptual blending; criticism; cultural-historical approach; popularization.

## Introduction

Conceptual blending (or conceptual integration) theory is, without a doubt, one of the central conceptual pillars of modern cognitive linguistics, and it has considerable influence on cognitive science in general. According to the authors, J. Fauconnier and M. Turner, conceptual blending is "a great mental capacity that, in its most advanced "double-scope" form, gave our ancestors superiority and, for better and for worse, made us what we are today. We investigate the principles of conceptual blending, its fascinating dynamics, and its crucial role in how we think and live" (Fauconnier, Turner 2002, V; for an extended commentary see: ibid., 389-396). In other words, conceptual blending here is claimed to be the key to the mystery of human evolution and cognition.

At first sight, such a groundbreaking point would be expected to lead to an intensive debate and to meet strong criticism from the less radical researchers. However, in fact, there are no heated debate around conceptual blending theory. We can find a number of papers raising some objections (Gibbs 2000; Harder 2003; Brandt 2005; Oakley, Hougaard 2008, 12; Ferguson, Sanford 2008, 610), but a comprehensive analysis of the theory's underpinnings, methodology, and heuristic potential is a matter of the future. This paper can be considered as a step in that direction.

## Theoretical underpinnings and structure of conceptual blending theory

Although this may be familiar information to some of readers, I will start with a coarse-grained description of the Fauconnier and Turner's attitudes. It allows more relevant understanding of my criticism in the second part of the paper. To be sure, some aspects of conceptual blending theory were touched earlier, but its first systematic description holds, presumably, in Fauconnier, Turner 1994.

Fauconnier, Turner 1996; Fauconnier, Turner 1998; Fauconnier, Turner 2000; Sweetzer 2000; Fauconnier, Turner 2002; Fauconnier, Turner 2008; Fauconnier 2009 should be mentioned as the salient milestones in the theory's development.

The gist of the theory can be formulated as follows: a) the unique feature of human beings is the capacity to create new meanings from existing ones; b) the main way to implement this capacity is to perform double-scope blending, that is, to build an integrated mental space on the base of a number of input spaces.

A star example illustrating that point is the Buddhist Monk riddle: "A Buddhist monk begins at dawn one day walking up a mountain, reaches the top at sunset, meditates at the top overnight until, at dawn, he begins to walk back to the foot of the mountain, which he reaches at sunset. Make no assumptions about his starting or stopping or about his pace during the trips. Riddle: is there a place on the path that the monk occupies at the same hour of the day on the two separate journeys?" (Fauconnier, Turner 2002, 39).

This riddle has an elegant solution if we imagine the monk strolling up and down on the same day, in other words, combine both walks. In such a blended space the monk is to meet himself and that place is the positive answer to the riddle question. The authors illustrate the solution with the following schema:
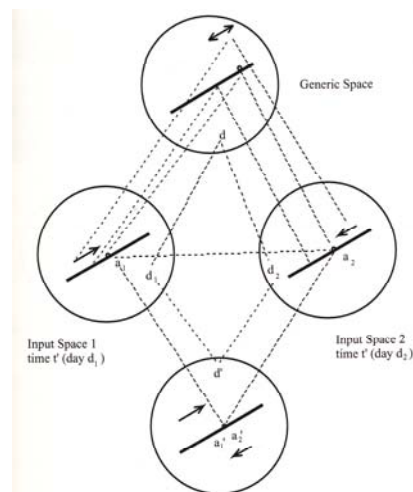


**Fig. 1. The basic schema of the Buddhist Monk riddle (Fauconnier, Turner 2002, 45)**

We can see here the two input spaces (the day of climbing on and that of climbing down), blended space and generic space, containing "what the inputs have in

common: a moving individual and his position, a path link-ing foot and summit of the mountain, a day of travel, and motion in an unspecified direction" (ibid., 41)).

Another striking example is "The Debate with Kant"[1]. Authors suggest to imagine a contemporary philosopher discussing the issue whether reason is innate capacity when leading a seminar. During that dispute he appeals to Kant as his opponent, namely, states his point, then poses hypotheti-cal objections retrieved from Kant's treatises, then again come up with his own counterarguments, etc. For the audi-ence it looks as face-to-face debate of two modern scholars. For the authors we have here the two input spaces connected with modern philosopher making claims in English and with Kant thinking and writing German. In the blend we find two philosophers speaking English to discuss ultimate phi-losophical problems. Thus, the blended space emergent structure in some aspects differs from that of input spaces radically reflecting the novel mental (but not ontological) reality.

The next example is so called *Regatta*. The backstory for it holds such facts: "The clipper ship *Northern Light* sailed in 1853 from San Francisco to Boston in 76 days, 8 hours. That time was still the fastest on record in 1993, when a mod-catamaran, *Great American II,* set out on the same course" (ibid., 63). According to authors, "a few days before the catamaran reached Boston, observers were able to say: *At this point, G r e a t  A m e r i c a n  I I  is 4.5 days ahead of N o r t h e r n  L i g h t "* (ibid.). This sentence con-structs blended space in close similarity with the Buddhist Monk riddle; like two monk trips above, two 140-year-distanced voyages are combined into a novel event, in this case, into the boat race. Such time scale compression paves the way for a pictorial perception of two voyages just as "The Debate with Kant" blend provides the audience's emo-tional engagement in the process of philosophical reasoning.

How wide the field covered by conceptual blending theory is, can be illustrated with two examples below. The first one is complex numbers, the second one is the com-puter desktop. As is well-known, complex numbers, expressed in the form *a+bi,* can be viewed as points or position vectors in a two-dimensional coordinate system called the complex plane where the real part of a number is represented with the horizontal projection, and the imaginary part with the vertical one. The authors suppose this representation to be the blend, where the first input space holds points in oriented plane with its vector transformations, whereas the second one contains real numbers with operations of addition and multiplication. The generic space in this case holds commutative ring operations on pairs of elements. In that perspective the blended space have a number of new features with regard to input ones (unlike real numbers there is not an order relation between two complex ones; unlike points and vectors complex num-bers can be multiplied and divided by each other). So, for

authors, conceptual blending is an important tool used to create the new knowledge in mathematics (see also Alex-ander 2011).

A computer desktop, for authors, is the blend of our day-to-day experience space (where we open folders to place or extract documents, throw old folders into a trash can, etc.) and space of formal operations performed in a computer (an abstract language of computer commands which correspond to virtual motions in the blend). In this case, again, the structure of the blend has obvious novelty as compared with input spaces.

Conceptual blending, the authors state, is an impor-tant tool to create novel grammatical and lexical construc-tions in language. Thus, the construction *Noun-Phrase Verb Noun-Phrase Prepositional-Phrase*, found in a great number of languages to express caused motion, is a con-ceptual blend of two different actions (e.g., *Jack threw the ball into the basket* includes three steps: Jack acts on the ball; the ball moves; the ball is in the basket. The blend combines the beginning and the end of the action, omit-ting the middle part). In some languages, like English, it can be extend to some other classes of action, e.g., *Anna sneezed the napkin off the table* or *The commander let the tank into the compound,* etc. (Fauconnier, Turner 1996; cf. Mandelblit 2000).

Such figures of speech as metaphor and metonymy are also blends, according to the authors. They describe highly conventional source-target metaphors as *single-scope networks*, where the integrated space frame is sup-plied by only one input space; e.g., *Murdoch knocked Iacossa out* for companies *Murdoch* and *Iacossa*. The integrated space here is a blend of a boxing match and business competition, but the blend topology has no in common with business, it is completely defined by the boxing space frame (Fauconnier, Turner 2002, 126-129).

Meanwhile, only a narrow class of metaphors can be represented by single-scope networks. For instance, this representation is impossible for the expression *digging one's own grave* (e.g., *They dug their own financial grave*). In this case the blend inherits the structure from "digging the grave" and "unwitting failure" inputs. How-ever, in the blend the input frames are not simply juxta-posed; the emergent structure is radically different from both of them in some aspects. Thus, in "digging the grave" space people dig the grave not for themselves, but for other people, who have already died. Furthermore, this action here is not a big blunder as opposed to the blend frame. In a similar vein, unwittingly failed (particularly, in the financial sphere) person is unlikely to operate with a real spade as his counterpart in the blend.

This type of integration frame entitled double-scope network characterizes, as mentioned, the unique human capacity distinguished human beings from other species. They date the emergence of this capacity to the epoch about 50,000 years ago and draw the birth of religion, art and language as a conclusion (ibid., 180-187). The gist of their argumentation can be formulated in the form of the following syllogism: a) the general process to provide the

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[1] All the examples discussed can be found in Fauconnier, Turner 1998 as well as in Fauconnier, Turner 2002.

human culture development is the emergence of novel conceptual structures on the base of existing ones; b) in double-scope networks the emergent blend structure has a novel quality with regard to the input spaces; hence, c) double-scope conceptual integration can provide the development of a wide range of cultural forms created by humans.

It is noteworthy that Fauconnier and Turner don't analyze concrete data to argue for this point, and their approach looks a bit like an "ivory tower" theory. At the same time such analysis can be found in the papers of other researchers working within Fauconnier and Turner's paradigm, particularly, in Sweetser 2000. In her work the author describes a hypothetical buffalo hunting ritual where primitive hunters perform a ritual dance in order to provide success in a real hunt in the future. In accord with Sweetser's views, such a ritual is a blend "between (Input 1) the ritual setting and participants and (Input 2) a hunting scene and its participants" (ibid., 319). The blended space holds the new elements which have no counterpart in the input spaces; a buffalo rock painting is transformed here into a real buffalo which is struck in the ritual dance, etc.

A researcher working with blending as a real cognitive process encounters the two general questions: which phases does this process have in on-line regime and what are the criteria to select the elements in the input spaces for the projection into the blend. Fauconnier and Turner try to tackle these issues, although it is hard to say if they are clear about that.

According to authors, "there are three operations involved in constructing the blend: *composition, completion,* and *elaboration*" (Fauconnier, Turner 1998, 144). The first stage is characterized by composing the blend from the elements of input spaces; then, the blend is completed with a great range of background conceptual structure; and on the last stage it is developed "through imaginative mental simulation according to principles and logic in the blend" (ibid.). The model described, however, did not rest on any experimental data and it is a problem to check whether it holds water.

With regard to the second issue the authors speak about *constitutive* and *governing* principles of conceptual integration. The first ones are connected with the general laws of logic and the rules of language, the second ones are more flexible and not so strictly defined. The authors mark out the overarching goal driving all of the governing principles: *Achieve Human Scale,* and several subgoals, namely, *Compress what is diffuse*; *Obtain global insight*; *Strengthen vital relations*; *Come up with a story*; *Go from Many to One*. Alongside with that, they suggest a number of more concrete principles, such as, *Topology Principle* ("Other things being equal, set up the blend and the inputs so that useful topology in the inputs and their outer-space relations is reflected by inner-space relations in the blend" (Fauconnier, Turner 2002, 327)) or *Integration Principle* ("Achieve an integrated blend" (ibid., 328)), etc. Again, the algorithm of applying these principles to particular cases is not transparent; e.g., it is not clear how to find out if topology is useful or not.

Given the overview of conceptual blending theory as completed here, let us move on to the next step.

## Some objections against conceptual blending theory

There are three aspects of conceptual blending theory as stated to be cast in doubt.

A) Contrary to Fauconnier and Turner's interpretation, almost all examples they suggest are connected with *the form* the conceptual operations are presented in, but not with their *essence* (the only exception is, perhaps, the quite specific Buddist Monk riddle). The main task of the blend in the examples given is to represent conceptual structure in a convenient, compact, familiar for an average person form; in other words, to provide its *popular* presentation[2]. The direct link between the popularization and conceptual blending is clear in the popular science literature, where extremely abstract ideas are represented in the form of visible images to be processed by the less educated audience. The S. Hawking's analogy between balloon in which cover tension holds air pressure within it and star where the gravitational interaction between atoms are balanced by the star gas pressure is a classic blend from conceptual blending theory perspective (the input space-1: a balloon, located near the earth's surface; a rubber cover; gas within the balloon; the input space-2: a star; helium and hydrogen atoms within the star; the blend: the star is a balloon with heated air inside, situated among other stars).

Another striking example of such "popular science blend" was suggested by A. Einstein to explain the space curvature in the general theory of relativity. It is the analogy between hypothetical "flat beings" existing in two dimensions and humans living in the three-dimensional space. The "flat beings" are able to perceive the line curvature, but not the space one; the humans can comprehend the curvature of the plane, but the curvature of the space is beyond their comprehension. The blend here holds human beings living inside the plane.

Let us now look from this perspective at Fauconnier and Turner's examples described above. Given "The Debate with Kant" story, the emergence of the blend has no impact on the essence of the problem discussed (in this case, as mentioned, the question whether reason is innate capacity). Such a debate could be held with another philosopher who shared Kant's ideas or, say, in inner dialog of the philosopher with himself. The format described by the authors gives the opportunity to adopt the disputed issue to the audience; it is a "pedagogical trick" transforming an abstract philosophical matter into a kind of

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[2] This point can be illustrated with a presentation at a conference. The quality of presentation is not directly connected with the quality of the idea. From time to time we encounter an attractive presentation representing a dull or controversial theory and vice versa.

performance, in other words, coming up with a story.

The "Regatta" example has the same structure. The blend gives here a visible and attractive picture of the events, while touching no ground or even distorting their ground (thus, it is not clear, if the context of the regatta described is relevant to the clipper *Northern Light,* which goal it pursued during the voyage from San Francisco to Boston, etc.).

The computer desktop example is consistent with the ones examined above. The emergence of the blend helps an average user to work with a computer because it transforms an abstract machine language into the set of objects from his day-to-day experience. Here again we deal with the adaptation of the conceptual structure to the cognitive horizon of the lay observer.

The "complex numbers" case, which is, perhaps, the strongest argument for blending as creation of novel conceptual knowledge, rests on misunderstanding. Complex numbers, as mentioned, are an ordered pair of real numbers which can be represented as a point in oriented plane. However, real numbers can also be represented as a point in oriented line or as a vector which reference point coincides with the origin of coordinates. We can only wonder why the authors address such representation for complex numbers and don't apply it to real ones. A geometric representation of complex numbers is in demand much less than an algebraic or a trigonometric one. The gist of complex numbers has no connection with properties of points in oriented plane or plane vectors. The gist of complex numbers as expansion of real numbers is determined by introducing "imaginary unit" $i$ ($i= \sqrt{-1}$) and by a lot of interesting properties connected with that. The analogy with points in plane provides visual image for complex numbers; hence, this case is situated in line with the ones examined above.

The construction *Noun-Phrase Verb Noun-Phrase Prepositional-Phrase* works, by and large, in the similar direction. Omitting middle links and pointing out only the beginning and the end of the process offer a more visible and dynamic process description which facilitates its perception.

To sum up my contention here, I would like to get to the general point: blending can not provide the emergence of new conceptual knowledge; its function is to adapt existing knowledge to the needs of average people. To consider blending as great mental capacity, which brought about the emergence of various forms of culture, means to put shoes on the wrong foot.

B) The lack of cultural-historical analysis is the next defect of the Fauconnier and Turner's approach. In order to illustrate that let us return to the metaphor *digging one's own grave.* This expression is likely to appear in different languages in the first decades of the 20th century. According to The Oxford English Dictionary, its earliest example dates back to 1934. Similarly, in Russian language it arises as metaphor in the 1920th alongside with its emergence in direct meaning (e.g., *Chasto jertvy prinujdalis' ryt' sebe sami mogilu (Often victims were forced to dig their own grave,*

*1924))*. If it is so, we can suppose that the metaphor *digging one's own grave* came into being as the comprehension of the new social experience of the first quarter of the 20th century, reflected by literature and language. The picture of people digging their own graves at gun point turned out so vivid and emotionally affecting that it entailed its expansion in other regions. Given this assumption is correct the metaphor structure proves to radically differ from the authors' description. To be sure, we can find here double-scope blending (a man digging his own grave at gun point performs this action by necessity, whereas a man plunging into financial adventure operates by choice; so, it is not fairly correct to speak about direct mapping of the "digging" input space onto the blend), but the other thing is important. Importantly, this or that construction emerges in the here and now, but not in the transcendental reality; in that, its emergence is brought about by socio-cultural shifts, but not by abstract schemas like one suggested by Fauconnier and Turner.

E. Sweetser's interpretation of the buffalo hunting ritual is, perhaps, even a more representative example of distortions influenced by eliminating socio-cultural aspect from the analysis. In order to argue that we need to address the school of cultural-historical psychology and, particularly, the concept *complex thinking* originated by L. Vygotsky (Vygotsky 1986). The Russian psychologist defined complex as a structure where the bonds between its components are contextual and flexible rather than abstract and fixed. He illustrated his approach with the striking Darwin's example: «A child's use of 'quah' to designate first a duck swimming on the pond, then any liquid, including the milk in his bottle; when he happens to see a coin with an eagle on it, the coin is also called a 'quah', and then any round, coinlike object. This is typical of a chain complex[3]—each new object included has some attribute in common with another element, but the attributes undergo endless changes» (ibid., 127). When thinking in complexes a child keeps in mind the same objects as an adult (which provides the right communication between them), but his way of operating these objects, and his mental schemas are radically different.

Given this concept as the ground, Vygotsky, among other things, explained the French cultural anthropologist L. Lévy-Bruhl's account of Bororo (the tribe of Northern Brazil) views which sounded counter to Aristotelian logic (Lévy-Bruhl 1978, Lévy-Bruhl 1979). For instance, the Bororo (the tribe in Northern Brazil) boasted that they were red araras (parakeets), which did not merely signify that they would become araras after their death, or that araras metamorphosed the Bororo, but they claimed that they were araras at the current time, which was their actual identity. Levi-Bruhl defined this operation as the law of participation and such way of reasoning as pre-logical thinking.

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[3] A chain complex is one of the ways of complex thinking.

For Vygotsky, the Bororo and araras make up a single complex; they are not two discrete entity. A great number of such complexes can be found in primitive and ancient cultures. For instance, magical operations with the name of the enemy were used to damage him, and because of that people endeavored to keep their true name in secret.

The buffalo hunting ritual is the part of the phenomenon described above. A buffalo rock painting and a genuine buffalo are not the two separate objects; they are the elements of the same object, namely, a complex with the topology, rather unusual for the modern people. If it does, to find the blend in this ritual is an obvious mistake.

Reasons of this kind cover a lot of other expressions examined by Fauconnier and Turner (particularly, their analysis of *the Grim Reaper* metaphor). The lack of the cultural-historical component in the analysis leads (at least, in some cases) to failure to reveal the true causes of blend emergence and evolution and to account for the real conceptual structure of the phenomena investigated.

C) It is also to the point to address here a set of experimental researches providing us with some data to estimate the correctness of conceptual blending theory from the psycholinguistic perspective. We will focus on the investigation of counterfactual conditionals as a significant example of such researches (de Vega et al. 2007; de Vega 2008; Ferguson, Sanford 2008; de Vega, Uritta 2011). Fauconnier and Turner take great pains to examine counterfactuals. Such counterfactuals as *If Clinton were the T i t a n i c , the iceberg would sink* alongside with the Buddhist Monk riddle or "The Debate with Kant" story would be considered as arch examples of conceptual blending. This sentence, for the authors, is the double-scope blend of *Titanic* and President Clinton mental spaces; in the blend Clinton collides with the iceberg and the iceberg is sinking. In this case blend is figured out as the novel mental space with the unique topology.

A part of experimental data in this field is completely consistent with the interpretation given. Thus, when participants read short stories like *Marta switched on the radio and heard the winning lottery numbers. Since she won the lottery prize, the first thing she did was to buy a new Mercedes car* and *Marta switched on the radio and heard the winning lottery numbers. If she had won the lottery prize, the first thing she would have done was to buy a new Mercedes car* and after reading were asked to verify a test probe belonged to the beginning of the story ("heard"), they verified it faster in the counterfactual than in the factual stories, which means, according to the authors, that in counterfactual story the situation model is not updated and the attention of the readers focuses on the initial information. This observation, in turn, argues for the view on counterfactual mental spaces as endowed with special qualities in comparison with factual ones (de Vega et al. 2007; de Vega 2008, 296-297).

The fact that correct comprehension of counterfactuals requires knowledge about both real and counterfactual worlds is also in line with the conjectures of conceptual blending theory (de Vega 2008, 298-299; Ferguson, Sanford 2008, 610; de Vega, Uritta 2011, 962-963).

However, the more precise analysis gives the strong evidence that Fauconnier and Turner's attitudes are too speculative to account for a real time cognitive process. The key question in this context is whether mental spaces are exclusively mental structures, which have no connection with human perception, or they are based on human sensorimotor experience. Although *de jure* the authors of conceptual blending theory stress the second opportunity, *de facto* they work with the first one.

In the meantime, the data of the experiments testifies the sensorimotor anchoring of meaning for counterfactual expressions, at least, for special groups of words. Thus, the results of de Vega, Uritta 2011 show that in the process of blend construction counterfactuals apply to the sensorimotor anchors similar to their factual counterparts. Similar point is formulated in Ferguson, Sanford 2008. The authors claim that the processing of a true utterance in the factual context and of a false utterance in the counterfactual one face similar obstacles at the first stage, and the principles of counterfactual space topology are comprehended by the reader only at the second stage of this process.

In other words, the schema of three phases in blend construction (composition, completion, and elaboration) doesn't work, at least, in two aspects. Firstly, the background conceptual structure doesn't complement the blend on the second step; it is kept in mind from the very beginning. Secondly, even after the blend constructed, its elements are perceived at the first phase as objects in the real space with all spectrum of sensorimotor reactions, and only afterwards they are replaced in the counterfactual space.

## Conclusion

I would like to sum up by saying that conceptual blending theory contains a lot of fascinating observations and provocative ideas extending the horizon of our knowledge. At the same time the authors seem to be prone to unreasonable generalizations, and they are not fairly correct in revealing the cognitive meaning of the operation they discovered. The view on blending as an important tool to adapt knowledge to the experience of average people seems to fit the gist of this procedure better than the intention to look at blending as a basic instrument for the creation of new knowledge.

The second weak point of conceptual blending theory is the lack of cultural-historical analysis as well as the absence of experimental data justifying it. It may therefore be interesting in this context to address the demarcation between formal *as-if* theories and *heuristic* theories, fitting the process in on-line regime (Gigerenzer, Todd 1999; Hertwig, Hoffrage 2012). Fauconnier and Turner present their theory as heuristic, but, to considerable extent, it looks like as-if theory. The elimination of this contradiction could provide a new impulse for the theory development and strengthen its heuristic potential.

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