# Complement to a theory of the cognitive distortions

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Paul Franceschi
University of Corsica
http://www.univ-corse.fr/~franceschi

## ABSTRACT

The purpose of this study is to describe a conceptual framework for cognitive distortions, which notably allows to specify more accurately their intrinsic relationships. This conceptual framework aims at inserting itself within the apparatus of cognitive therapy and of critical thinking. The present analysis is based on the following fundamental concepts: the reference class, the duality and the system of taxa. With the help of these three notions, each cognitive distortion can be defined. A distinction is also made between, on the one hand, general cognitive distortions and on the other hand, specific cognitive distortions. The present model allows then to define within the same conceptual framework the general cognitive distortions such as dichotomous reasoning, disqualifying a given pole, minimisation and maximisation. It also allows to describe as specific cognitive distortions: disqualifying the positive, selective abstraction and catastrophism. Furthermore, the present model predicts the existence of two other general cognitive distortions: the omission of the neutral and requalifying in the other pole.

The cognitive distortions, introduced by Aaron Beck (1963, 1964) and Albert Ellis (1962) are traditionally defined as fallacious reasoning that plays a crucial role in the emergence of certain mental disorders. The cognitive therapy in particular is based on the identification of these cognitive distortions within the everyday way of thinking of the patient, and their replacement by alternative reasoning. Traditionally, the cognitive distortions are represented as one of the twelve following irrational modes of reasoning: 1. Emotional reasoning 2. Overgeneralization 3. Jumping to conclusions (or arbitrary inference) 4. Dichotomous reasoning 5. Should statements (Ellis 1962) 6. Fortune telling or mind reading 7. Selective abstraction 8. Disqualifying the positive 9. Maximisation and minimisation 10. Catastrophism 11. Personalisation 12. Labelling.

Under their classical form which is that of an enumeration, the cognitive distortions plays a central role within the field of cognitive therapy. Considering also their widespread nature in normal reasoning, it is allowed to think however that an adequate understanding of the cognitive distortions proves also to be useful outside the field of psychopathology. In particular, the cognitive distortions can also be considered as part of the apparatus which constitutes *critical thinking*. For these reasons, it appears that a conceptual framework, notably allowing to define the relationships between the different cognitive distortions, could also turn out to be useful. In what follows, we shall set out to present a general theory of the cognitive distortions, which brings a certain number of supplementary elements in comparison with classical theory.

# 1. Main notions

The present framework allows to represent several classical cognitive distortions: dichotomous reasoning, disqualification of one of the poles, selective abstraction, minimisation and maximisation. To these, one can add two other cognitive distortions of which the present model allows to predict the existence and which are closely related to the classical cognitive distortions, although they are not included, to the knowledge of the author, among these last. It consists of the *omission of the neutral* and of the *requalification in the other pole*.

The cognitive distortions can be constructed, in the present model, from three main notions: the *reference class*, the *duality* and the *system of taxa*. It is necessary, in a preliminary way, to set out to describe these three notions. The *reference class*, above all, is constituted by a set of phenomena or objects. Several examples can be given here: the class composed of the events and facts of the patient's life; the class of the future events of the patient's life; the class constituted by all the parts of the patient's body; the class which is made up of the patient's character's traits.

The notion of *duality*, second, corresponds to a pair of concepts such as Positive/Negative, Internal/External, Collective/Individual, Nice/Ugly, etc. A duality corresponds then to a criterion under the angle of which the elements of the reference class can be considered or evaluated. Let us denote by A/Ā a given duality, where A and Ā constitute then *dual* concepts. An enumeration (necessarily partial) of the dualities is as follows: Positive/Negative, Internal/External, Quantitative/Qualitative, Visible/Invisible, Analytical/synthetic, Absolute/Relative, Abstract/Concrete, Static/Dynamic, Unique/Multiple, Aesthetics/Practice, Definite/Vague, Finite/Infinite, Simple/Composite, Individual/Collective, Implicit/Explicit, Intentional/Unintentional.

Finally, the patient's *system of taxa* consists of a taxonomy which allows the patient to evaluate and to classify the elements of the reference class, according to the criterion corresponding to a given duality A/Ā. These taxa can be considered as "what can see" the patient. The system of taxa consists of a system of values which is inherent to the patient or of a filter through which the patient "sees" the elements of the reference class, i.e. the phenomena or the objects of reality. The figure below represents an optimal system of taxa.
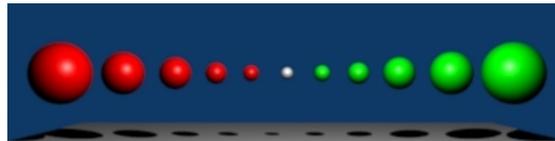

*Fig.1. The optimal system of taxa*

This last is composed of 11 spheres which represent each a given taxon. The system of taxa is optimal, because all taxa are present. On the other hand, if the patient does not have some taxa, he cannot see nor count the corresponding elements. For example, if he/she lacks the taxa of the duality A/Ā corresponding to pole A, he cannot see the corresponding elements. In the same way, if the patient has no neutral taxon in his/her system of taxa, he cannot see the neutral elements of the reference class. More formally, let us consider then a series of $n$ elements $E_1$, $E_2$, ..., $E_n$ such that each of them has, in a objective way, a degree $d[E_i]$ in a duality A/Ā comprised between -1 and 1 ($d \in [-1, +1]$). We can consider then a series including 11 elements, $E_1$, $E_2$, ..., $E_{11}$, which present an objective increasing degree (the choice of 11 elements is here arbitrary, and any other number would also do the job). Let us pose then: $d[E_1] = -1$, $d[E_2] = -4/5$, $d[E_3] = -3/5$, $d[E_4] = -2/5$, $d[E_5] = -1/5$, $d[E_6] = 0$, $d[E_7] = 1/5$, $d[E_8] = 2/5$, $d[E_9] = 3/5$, $d[E_{10}] = 4/5$, $d[E_{11}] = 1$. Let us also define a subjective degree $\Delta[E_i]$ such that it is attributed by the patient to each of the $E_i$. So, $E_1$-$E_5$ corresponds to the pole A of duality A/Ā, $E_6$ to the neutral taxon and $E_7$-$E_{11}$ corresponds to the pole Ā. Moreover, this optimal system of taxa can be assimilated with one Likert scale with 11 degrees.

At this stage, we are in a position to define the main cognitive distortions, and it is worth considering them in turn. The cognitive distortions can be defined as a type of reasoning which leads to favour,

without objective grounds, a subset of the taxa applicable to a given duality A/Ā, in order to qualify a given reference class. It also proves to be useful to draw a distinction, in a preliminary way, between the general cognitive distortions and the specific cognitive distortions. The general cognitive distortions relate to all reference classes and all dualities. By contrast, the specific cognitive distortions are mere instances of the general cognitive distortions which are inherent to a given reference class and to a given duality.

## 2. The cognitive distortions

### 2.1 Dichotomous reasoning

In the present context, dichotomous reasoning (or *all-or-nothing thinking*) can be defined as a general cognitive distortion which leads the patient to consider a given reference class only according to the two extreme taxa which relate to every pole of a given duality. With this type of reasoning, the patient ignores completely the presence of degrees or of intermediate steps. In his/her taxa system, the patient has as well the two extreme taxa corresponding to poles A and Ā. The defect in that way of considering things is that facts or objects corresponding to intermediary taxa are not taken into account. So it results from it a reasoning without nuances nor gradation, which proves to be maladapted to properly apprehend the diversity of human situations. Formally, dichotomous reasoning consists in taking into account only the elements of the reference class such as $|d[E_i]| = 1$, or $d[E_1] = 1$ or $d[E_{11}] = -1$, by ignoring all the others.


*Fig. 2. Dichotomous reasoning*

### 2.2 The disqualification of one of the poles

In the present model, the disqualification of one of the poles is the general cognitive distortion which leads to give an arbitrary priority to one of the poles of a given duality, in order to qualify the elements of a reference class. It consists then in the fact of attributing more importance to one of the poles rather than to the other one, in the lack of objective motivation. The taxa corresponding to one of the poles of a given duality are lacking in the patient's system of taxa. So, the patient sees things only through the prism of pole A (respectively Ā), by ignoring completely the viewpoint of the opposed pole Ā (respectively A). Formally, the disqualification of one of the poles leads to consider only the $E_i$ such that $d[E_i] \leq$ (respectively $d[E_i] \geq 0$), by ignoring any events such that $d[E_i] > 0$ (respectively $d[E_i] < 0$).
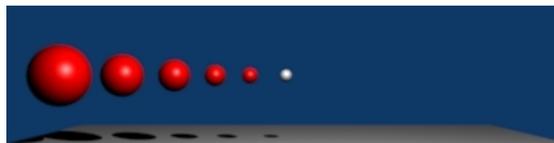

*Fig. 3. Disqualification of one of the poles*

An instance of the disqualification of one of the poles consists in the *disqualification of the positive*. This last can be analysed, in the present context, as a specific instance of the disqualification of one of the poles, which applies to the Positive/Negative duality and to the reference class including the facts and events of the patient's life. The patient tends then to ignore positive events, by considering that they do not count, for any reason. Such instance finds to apply in the cognitive therapy of depression.

Another instance of the disqualification of one of the poles also applies to the Positive/Negative duality and to the reference class which comprises the character's traits of the patient. He/she completely ignores

his/her positive character's traits (qualities) and only directs his/her attention to his/her negative character's traits (defects). This encourages then him/her to conclude that he/she "is worth nothing", that he/she is "a failure". Such instance also applies in the cognitive therapy of depression.

### 2.3 Arbitrary focusing on a given modality

Another type of cognitive general distortion consists in arbitrary focusing on a modality of a given duality. In the present context, this type of general cognitive distortion leads to favour one taxon in the patient's system of taxa, by ignoring all the others. In arbitrary focusing, the taxon being discussed is present in the patient's system of taxa, and is affected to a unique element of the reference class. There is an occultation (in general temporary) of others taxa and of other elements of the reference class, so that the patient is haunted by this specific element.



*Fig. 4. Arbitrary focusing*

A particular instance of this type of general cognitive distortion, relates to the reference class of the facts of the patient's life, and to the Positive/Negative duality. It is a specific cognitive distortion, which consists in focusing on a negative event of the patient's life. It identifies itself with one of the classical cognitive distortions, defined as *selective abstraction* (*Mental filter*), which consists in the fact of choosing one detail with a negative connotation and to focalise on it. Suchlike, the patient sees only this detail, and his/her vision of reality is darkened because it is entirely tinted with this particular event. Such instance applies in the cognitive therapy of depression.

One can also mention another instance of arbitrary focusing, which also applies to the Positive/Negative duality, but relates to the class of reference composed of the hypothetical future events of the patient's life. In that case, the patient focalises on the possible happening of a very negative event. Such instance finds to apply in the cognitive therapy of generalised anxiety disorder.

Another specific instance of arbitrary focusing applies to the Nice/Ugly duality and to a reference class which identifies itself with all the parts of the patient's body. The patient focalises then on a detail of his/her anatomy which he considers to be ugliness. The patient has well, in his/her system of taxa the Ugly taxon in question. Moreover, he/she affects this taxon to a unique part of his/her body, while all the others taxa are temporarily occulted. Such specific cognitive distortion finds to apply in the cognitive therapy of body dysmorphic disorder (Neziroglu and Yaryura-Tobias 1993, Veale and Riley 2001, Veale 2004).

### 2.4 The omission of the neutral

The present model also leads to predict the existence of another type of general cognitive distortion, which consists in the omission of the neutral. This latter cognitive distortion results from the absence, in the patient's system of taxa, of the neutral taxon. It follows that the elements of the reference class which can objectively be defined as neutral with regard to a given duality $A/\bar{A}$, are not taken into account by the patient. Formally, the patient omits to consider the $E_i$ such that $d[E_i] = 0$. The omission of the neutral sometimes plays an important role, notably when there is a gaussian distribution of the elements of the reference class, where the elements objectively corresponding to the neutral taxon are precisely those which are the most numerous.
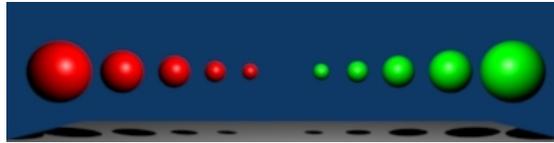
*Fig. 5. Omission of the neutral*

*2.5 The requalification in the other pole*

The present model also leads to predict the existence of another type of general cognitive distortion. It is the reasoning which consists in re-qualifying an event belonging to a given duality A, in the other duality Ā. Formally, the subjective degree attributed by the patient to a given event E is the opposite of its objective degree, so that: $\Delta[E] = (-1) \times d[E]$.
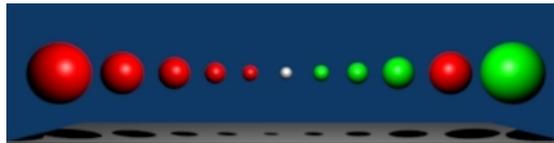

*Fig. 6. Requalification in the other pole*

A characteristic instance of requalification in the other pole consists in the specific cognitive distortion which applies to the class of the events of the patient's life and to the Positive/Negative duality. This consists typically in re-describing as negative an event which should be objectively considered as positive. By requalifying positive events in a negative way, the patient can reach the conclusion that all events of his/her life are of a negative nature. For instance, by considering the past events of his/her life, the patient notes that he/she made no act of violence. He/she considers this to be "suspect". This type of instance also finds to apply within the cognitive therapy of depression.

Another instance of requalification in the other pole consists in the specific cognitive distortion which applies to the class of the parts of the patient's body and to the Nice/Ugly duality. Typically, the patient re-qualifies as "ugly" one part of his/her body which is objectively "nice". Such specific cognitive distortion relates to the cognitive therapy of body dysmorphic disorder.

*2.6 Minimisation and maximisation*

This general cognitive distortion consists in attributing to an element of the reference class, a taxon according to the criterion of a duality A/Ā which proves to be lower (*minimisation*) or greater (*maximisation*) than its objective value. It consists here of a classical cognitive distortion. The subjective degree $\Delta[E]$ which is attributed by the patient to an event E differs significantly from its objective degree $d[E]$. In *minimisation*, this subjective degree is distinctly less than, so that $|\Delta[E]| < |d[E]|$. In *maximisation*, by contrast, the subjective degree is distinctly greater, such that $|\Delta[E]| > |d[E]|$.
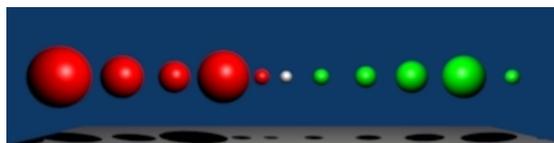

*Fig. 7. Maximisation and minimisation*

A specific instance of minimisation relates to the class of the facts of the patient's life and to the Positive/Negative duality. The patient tends to consider certain facts of his/her existence as less positive than they in reality are. In maximisation, he/she considers certain facts of his/her life as more negative than they really are. In the present context, the classical cognitive distortion of *catastrophism* (or

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*dramatisation*) can be considered as a specific cognitive distortion, which consists of a maximisation applied to the negative pole of the Positive/Negative duality. The patient attributes then a subjective degree $\Delta[E]$ in the Positive/Negative duality to an event, while the absolute value of its objective degree $d[E]$ is very distinctly lesser. Such instance applies to the cognitive therapy of depression.

## 3. Conclusion

As we see it, the present theory provides several elements, in comparison with classical theory, that allow to define and to classify the classical cognitive distortions, within the same conceptual framework. These last are considered, either as general cognitive distortions, or as specific cognitive distortions, i.e. as instances of the general cognitive distortions which relate to a given reference class and duality. Thus, *dichotomous reasoning*, *maximisation* and *minimisation* constitute general cognitive distortions. In addition, *disqualifying the positive*, *selective abstraction*, *selective negative focus* and *catastrophism* constitute then specific cognitive distortions. Besides, the present analysis has allowed to describe two additional general cognitive distortions: the *omission of the neutral* and the *requalification in the other pole*.

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