Effectiveness of mental footnotes in the cognitive therapy for panic attack: two case-studies

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ABSTRACT

New findings in the area of experimental, cognitive psychology point out that the implicit meanings determine the information that is being processed. The so-called *mental footnotes* can even modify the path trajectory in a driving task. This influence has been proposed to go beyond this kind of task. Mental footnotes have been proposed as determining factors in the information processing in specific psychopatological syndromes. The objective of this study is to evaluate the adequacy of applying these *implicit pieces of information*, in form of mental footnotes, to stop the series of catastrophic thoughts in the panic attack syndrome. Following the theory of mental models and the iconic representation of the real world, two cases of panic attack have been treated. By using the *negation illusory-reality technique*, a mental footnote of *this does not have to happen* was added to the catastrophic representation of the world in patients with this syndrome. As a result, these two patients have not reported panic attacks in, at least, 2 year after the last session of therapy. A deeper study of the efficacy of this technique is encouraged in order to be recommended for the treatment of patients who suffer from panic attacks.

Key words: Panic attack; Cognitive therapy; Mental footnote; Mental models.

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Citation: Vilchez Tornero, J. L., (2019). Effectiveness of mental footnotes in the cognitive therapy for panic attack: two case-studies. *Research in Psychotherapy: Psychopathology, Process and Outcome, 22*(1), 123-127. doi: 10.4081/ripppo.2019.337

Conflict of interest: the author declares no potential conflict of interest.

Funding: none.

Ethical statement: this study was carried out in a clinical, psychological context and it respected all the agreements of Helsinki 1975, both in the treatment of information and in obtaining the respective informed consent.

Received for publication: 21 September 2018.
Revision received: 10 January 2019.
Accepted for publication: 10 January 2019.

Research in Psychotherapy:
Psychopathology, Process and Outcome 2019; 22:123-127
doi:10.4081/ripppo.2019.337

Introduction

Cognitive therapy is based on the way subjects structure and represent their world. This way determines their behavior and emotions (Beck, 1967). All new information processed is accommodated to the knowledge humans already possess, by means of mental representations (Beck, 1976). If the acquisition of new information depends on *toxic concepts* (in term of Vilchez, 2016), mental problems can arise. In terms of Piaget (1928), the representations of the world that surrounds us set up our preconceived ideas, which guide us both in the storage of information and in the manner we deal with the information already stored (in the form of *schemes* of action). These mental schemes determine how we look at the world. When maladaptive, mental schemes trigger unpleasant emotions, our daily life can be interfered. For this reason, it is necessary to change the mental representations/schemes that delay our normal, personal development. By using the cognitive restructuring, those concepts that are harmful and, therefore, our emotions can be changed; *emotive rational therapy* (in terms of Ellis, 1958, 1962).

When dealing with information, our representations not only structure the knowledge we already have, but also determine the reasoning of new problems, as well as the formation of new concepts (Neisser & Weene, 1962). In this sense, in the literature individuals have been proposed to reason based on *mental models* (in terms of Johnson-Laird, 1983, 2006). These mental models are generated from our previous concepts, in combination with the present information we are processing. These mental models

of reality are the representation of the common characteristics (and the dynamic relationships between them) of a variety of entities related to a given problem (Barwise, 1993). When we decode new information through an expression (either verbal or iconic), we imagine what is possible with regards to the meaning of it. In this sense, for human beings, something will be true if the meaning of that expression is sustained in each and every one of the mental models we generate. On the other hand, something will be a lie for us if we can find at least one mental model in which that expression does not hold. In other words, a sentence will not be true for us if we find data that are an exception to, and therefore refute, what is stated in the expression (*e.g.*, Johnson-Laird, 2006).

The theory of mental models (Johnson-Laird, 1983) proposes that the representations of the world are as iconic as possible. In this way, the imagination is the base of many reasonings such as deductions, inductions or probabilistic inferences. The mental models are created from different sources such as perception, imagination or the understanding of verbal propositions. The products of the acquisition of information are mental images whose structure is analogous to the structure of reality. The nature of our manner of representing reality makes it easier for us to reason with metaphors, which we can draw mentally with greater detail (Lakoff & Johnson, 1980). In the reasoning based on the mental models, the context plays an important role (Thompson, 2000). The simplest example of this modulation of reasoning by information that is not present in an expression is denial. To represent the negation of something, the subjects do not represent false clauses of that meaning but imagine what is true and add a *mental footnote* (in terms of Bucciarelli & Johnson-Laird, 2005) that captures that what is being processed is false. Mental footnotes are defined as pieces of information that "are set out to be the general framework where other kinds of thinking take place, as *the color of the glass we look through* (in terms of Shrauger & Schoeneman, 1979)" (Vilchez, 2016, p. 159). Bucciarelli and Johnson-Laird (2005) investigated this way of representing reality by using deontic logics; the logic used to formally analyze propositions that deal with norms. Participants made a list of the representations they were imagining when dealing with propositions such as "workers are obligated/forbidden to go on holidays in August". When the word used was *obligated*, the subjects imagined the workers on holidays in August. However, when the word was *forbidden*, the participants imagined the workers on holidays *not* in August (Byrne, 2005), denying that specific possibility. A simple example of the functioning of this type of processing could be appreciated if the reader was asked to "not imagine an elephant". In this case, the reader would probably imagine an elephant and add a mental footnote to deny that possibility.

On the side of the emotional consequences of maladaptive reasoning, panic attacks may be the most extreme case of a faulty reasoning. These attacks are terrors characterized by being accompanied by tachycardia, chest pain, shortness of breath, and dizziness (American Psychological Association, APA, 2013). In the diagnostic manual of the APA, the terrors must be sudden. In this sense, although the subject perceives the sensation of terror suddenly, from an information processing point of view, this fear of losing control is the last step of a whole series of automatic reasonings (Vilchez, 2016). Classical literature has linked the panic attacks to catastrophic imaginations (Beck, Laude, & Bohnert, 1974; Ost & Hugdahl, 1983). Considering that the panic attack disorder is the product of a maladaptive reasoning in which the subject vividly imagines a catastrophic illusory reality (Vilchez, 2016), mental footnotes of negation were introduced for the treatment of two cases of this syndrome. Negation (as a contextual modulator of reasoning) can help to avoid the spiral of catastrophic reasoning regarding to: i) stopping the panic attack once the process has been started; ii) not even triggering that spiral of thinking and, therefore, addressing the problem at the first stages of the information processing (since, because of classical conditioning, the very first stages of the reasoning process will be associated now to a very different kind of thinking and, therefore, emotions). I call this technique the *Negation of the Illusory Reality* (NIR).

The Negation of the Illusory Reality technique

The technique consists in applying the mere addition of a mental footnote of "this isn't going to happen" to any mental model of a catastrophic situation that patients are mentally representing (*e.g.*, Johnson-Laird, 2006). The goal of this implementation is that, since individuals are imagining a *reality* that is illusory (Vilchez, 2016), the plain negation of that mental representation (based on the mental footnote of denying of Bucciarelli and Johnson-Laird, 2005), will stop the circle of panic escalation, the physiological activation and, therefore, the subsequent more catastrophic representation of the future. The expected outcome is not only the cessation of the current panic attacks but the cease of the panic attacks that the subjects will have in the future.

Materials and Methods

Participants

Participant 1

FN was the first subject to whom the technique of NIR was applied; 25 years old, male and Portuguese. FN was a lifeguard in a gym in the city of London, United Kingdom. FN had a stable female partner although he was unfaithful on sporadic occasions. FN reported being jealous and believing that his partner was also unfaithful. In the patient's history, he had suffered only two panic attacks

prior to a series of seven episodes that occurred in the period before treatment (6 months before the first individual, clinical session). When working as a lifeguard, and according to the regulations of the country of residence, FN could not use any electronic device or read any book or newspaper during his work. He had only three periods of 10 minutes for resting in an 8 hours working day. The subject reported that, when he was working, his mind *flew*. In the case of Participant 1, the panic attacks spun around imagining his partner (who worked in the same gym franchise but in another location) having intimate relationships with her co-workers. Patient FN gave great importance to his physique and respected the signals of physical power of others, so the catastrophic imagination spun around she falling in love or having sex with somebody stronger than him. On suspicion that his partner was being unfaithful, FN called by phone or wrote messages to her (if he was not around) or went to the place where she worked with the excuse of training with her, which prevented the catastrophic thoughts of infidelity from taking their course.

The problems arose when FN was working and he could not control his thoughts by contacting his partner and confirming that, at that moment, she was not being unfaithful. In these cases, catastrophic thoughts of his partner training with someone who could attract her sexually, having a date with him or even having sex flew in FN's mind. This type of thoughts increased the level of arousal in FN, which turned into a feeling of lack of control that triggered the panic attack. When he perceived that his body was abnormally active in a circumstance of physical inactivity, FN felt that he had no control over his body and vivid, catastrophic images of him having a heart attack or even dying settled in his mind. When panic attacks happened, FN's supervisors let him out of the pool until his emotional state returned to normal.

Participant 2

HS was the second patient to be applied the NIR technique; 67 years old, male, married for 30 years, British and also resident in London. Individual sessions were also taken with this patient. HS had held a position of responsibility in the local government of his community, had been a professor at one of the universities in London and, although retired, was hired sporadically for advisory services in human resources management for large national companies. HS had also been very active in the struggle for gay, lesbian and bisexual rights in the United Kingdom's *Stonewall* Association. Participant 2 reported "being the organizer of the family". He had taken a more predominant role than his husband both in the family economy and in making decisions that concerned the family. This organizing role came both from his personality and from the jobs that HS had worked in. Participant 2 agreed with this hypothesis. The first panic attack reported by HS took place in a stressful travel to a pleasure trip that he and his partner used to enjoy in other past occasions. The large body size of HS made him being uncomfortable on planes. The couple used to travel intercontinentally, which prolonged flight hours and sustained uncomfortable circumstances for longer. HS also suffered from respiratory problems (chronic bronchitis) that were aggravated by the height and stale air of the aircraft. All these factors caused that on three occasions, the subject had panic attacks on the plane. When Patient 2 arrived at the clinic, he reported that he was suffering from panic attacks in his own home for 3 months, apart from those he had had during his travels. HS woke up in the night with cold sweats and breathing problems that were not caused by the aforementioned health condition. In his case, the catastrophic thoughts revolved around losing control, not being able to respond to the adverse circumstances caused by his medical situation and "not trusting his partner to know how to react to an emergency situation".

Procedure

For both cases, during the first individual session (of one hour of duration), the problematic circumstances were analyzed and the contexts and triggering elements were identified. Participants were instructed to record the line of thoughts they followed just before the panic attacks began, examining step by step how the process was like. In the second session (of one hour duration as well), the registered catastrophic thoughts of both patients were studied. The problem was conceptualized as coming from an excessive skill for imagination and creativity. It was clarified that this ability could benefit them and help them in their professional and personal life. However, it was explained that this ability also had a *dark side*. Both patients reported that they were unable to control their imagination and, during treatment, they were encouraged to not even try to do so.

Materials

Given that the problem in both cases was identified as an *over-activation* of the patients' imagination ability, they were given explicit permission to imagine everything they wanted; when they wanted. Since the technique was developed in the theoretical analysis of how reasoning is carried out as a cognitive process, after expounding how human beings reason based on iconic mental models of reality and how we represent denial by means of mental footnotes (Bucciarelli & Johnson-Laird, 2005), participants were asked to add mental footnotes to their catastrophic mental representations, denying the illusory reality represented (Vilchez, 2016). The mental footnotes were of the type of: "the fact that I am vividly representing that something bad is going to happen, does not mean it will happen". This mental footnote was not necessarily said loudly like a mantra.

Results

Patients were free to call at any time to arrange the next appointment in the following months after the last session. In this sense, FN called after 3 weeks and HS did it approximately one month later, both of them simply to inform that a third appointment would not be necessary in either case. The two patients also reported that no panic attack had happened in that period of time and commented that they feel much better physically. Although both patients reported that the initiations of panic attacks were still present, both of them declared that they were able to control these *conati* by applying the technique of adding mental footnotes to the illusory reality that was being represented, in order to deny it.

They applied the technique simply adding a mental footnote of "this isn't going to happen" to any mental model of a catastrophic situation they were representing in their working memory (in term of Baddeley & Hitch, 1974). Following the mental model theory (*e.g.*, Johnson-Laird, 2006), subjects represent the real world by means of dynamic and iconic ideas of they are reasoning with or imagining. Since this *reality* is illusory (Vilchez, 2016), the technique applied (NIR technique) was the plain negation of this mental representation, based on the mental footnote of denying of Bucciarelli and Johnson-Laird (2005). It has been more than 2 year, since the last session that was held with each patient. During this period of time, there have been follow-up communications with both. Both have reported that panic attacks have never happened again and that even the initiations of them have diminished considerably until they are totally insignificant in their life. An automation of the application of the NIR technique was also reported.

Discussion

As detailed above, the processing of information is expressed both in the behavior and in the emotion experienced by individuals (Beck, 1967; Ellis, 1958, 1962). In the case of panic attack disorders, the influence on behavior and emotion is extreme. In the case of FN, the symptomatology seems to be related to the *theory of mind* (Premack & Woodruff, 1978). Patient 1 was being unfaithful to his partner, therefore, it seemed that his thinking was imbued in the reasoning "if I am being unfaithful, she is also being". A chain of images about intimacy of his partner with other people was flowing in his thinking. The escalation of anxiety began with mental images of his partner in certain activities with other co-workers. Patient FN gave great importance to his physique and respected the signals of physical power of others, such as their musculature or their technique in martial arts such as Brazilian *jui jitsu*. The fact that his partner shared time with attractive people triggered in his mind the logical step of imagining his partner feeling attracted to men with these qualities. When he perceived that his body was abnormally active in a circumstance of physical inactivity, FN felt that he had no control over his body and vivid, catastrophic images of him having a heart attack or even dying settled in his mind. With the denial of that vivid but unrealistic representation (by using a mental footnote), FN was able to control the disturbing thoughts about his partner, which used to trigger the panic attacks. By avoiding increasing his level of arousal, collaterally both panic attacks and its *conati* were avoided.

In the case of HS, it must be taken into account that this patient already had respiratory problems caused by a non-psychological source. It was the perception of these problems in a catastrophic manner what increased these problems (he breathed even more difficulty than normal). The fact that the patient (because of his role family and the psychological pressure exerted on himself; see Herrera Santi, 2000) was not used to have his partner taking control of problematic situations makes him not to trust that his partner could assist him in a medical, emergency case. At the end of the treatment, HS was able to control both the triggering of panic attacks and its *conati* by using the NIR technique, denying the mental representation of his partner not being able to assist him. In this case, the awakenings with startle in the middle of the night also stopped and the subject even reported the initiation of a reorganization of the management of responsibilities between his partner and him (which is interesting from a Systemic Psychology point of view).

The restructuration of the concept of "I am unable to control my thoughts" to the concept "my creativity and imagination are very powerful but can be re-directed" made possible, in both cases, the acknowledgement of their idiosyncratic personal characteristics. This *rethinking* also liberated their imagination from the role of *controller* of their emotions, which used to provoke the panic attacks (Vilchez, 2016), to a role more free and creative.

Mental footnotes have been proposed to be present in much wider, social contexts (Vilchez 2018, 2019). The technique of NIR can be also proposed, used and evaluated in situation out of clinical context. The working and educational areas are the easier areas in which apply this technique. Denying the illusory reality can be beneficial for those workers who feel that they "are not worthy enough" or they "can't get whatever they deserve", in order to increase their self-confidence and prevent working accident, for example. In educational context, this technique can increase the ability of self-learning to make student more independent in their knowledge constructivism.

Conclusions

Taking into account the results reported in this study, deeper studies of the efficacy of this technique are encouraged. This technique has to be verified in its adequacy for

this kind of mental problems, in order to be recommended for the treatment of patients who suffer from panic attacks. Different kind of subjects and different clinical contexts must be sound out before applying this technique in a wider manner.

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