PERSPECTIVE ARTICLE

THE DYNAMICS OF FEAR AT THE TIME OF COVID-19: A CONTEXTUAL BEHAVIORAL SCIENCE PERSPECTIVE

Giovambattista Presti, Louise McHugh, Andrew Gloster, Maria Karekla, Steven C. Hayes

Abstract

COVID-19 is the relevant disease caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) transmitted via close contact between persons. On March 12th, 2020, WHO announced COVID-19 outbreak a pandemic, in view of its worldwide escalation. As the pandemic disease explodes, a parallel outbreak of fear and worry is also spreading. We react to fear symbolically, by arbitrarily relating it to other objects and events through derived verbal relations, so language may alter the way we experience events and consequently affects how we are functionally or dysfunctionally oriented to the world around us. In this paper we will outline the different human learning processes connected to fear responding, from the simplest type to the more complex cognitive ones, approaching them from the point of view of contextual behavioral science, a modern form of behavioral thinking. We will outline a model of intervention to foster psychological flexibility and more functional value-based actions. We will argue that in a pandemic and in the post-pandemic phase it could be a key for adapting to new and changed circumstances.

Key words: fear, relational frame theory, acceptance and commitment therapy, COVID-19, coronavirus, contextual behavioural science

Giovambattista Presti[1], Louise McHugh[2], Andrew Gloster[3], Maria Karekla[4], Steven C. Hayes[5]
[1] Department of Human and Social Sciences, UKE - Kore University of Enna (Italy)
[2] School of Psychology, University College Dublin (Ireland)
[3] Faculty of Psychology, University of Basel (Switzerland)
[4] Department of Psychology, University of Cyprus (Cyprus)
[5] Department of Psychology, University of Nevada, Reno (United States)

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Corresponding author
Giovambattista Presti
Department of Human and Social Sciences, University of Enna "Kore"
Cittadella Universitaria
94110 Enna (Italy)
E-mail: giovambattista.presti@unikore.it

Impact of COVID-19 pandemic

As of April 1 2020, more than 800,000 cases of Coronavirus disease 2019 also named COVID-19 disease and 40,598 deaths had been confirmed worldwide (WHO, April 1 2020). COVID-19 is the relevant disease caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and can be transmitted via close contact between persons (He, Deng, & Li, 2020). Severe and even fatal respiratory diseases (e.g., acute respiratory distress syndrome (ARDS) and acute respiratory failure) develop in patients and 5% of them end up in intensive care units (Guan, Ni, Hu, Liang, Ou, et a. 2020). Reports and calculation on its fatality rate are still contradictory in part because many people who are infected are asymptomatic. The most recent infection fatality ratio estimates (Russel et al., March 26, 2020; Verity et al, March 30, 2020) are converging on a rate of about 66%; case fatality ratios are at least two to three times higher broadly similar to the early estimate of 2% of cases (Mahase, 2020). Higher estimate range to 5.6% in China and 15.2% outside China, when considering a 14-day delay model that compares the death at a given date to the number of hospitalized patients 14 days earlier (Baud, Qi, Nielsen-Saines, Musso, Pomar, et al. 2020).

Human beings react cognitively to every known event, so pandemics are not simply biological diseases confined to health specialists, they also influence individuals and society more generally through symbolic relations. Given the worldwide scale of COVID-19, media coverage has amplified the psychological and social effects of this pandemic. These effects ranged from neglecting the threat initially, to later highlighting the virus and the disease in such a distinctive and dangerous way that sometimes stress, anxiety, and even a sense of panic were generated. For example, emotional responses elicited and amplified by media coverage, have led to unnecessary hoarding of various products, leaving empty shelves at supermarkets, even of products that have no real relation to the outbreak, such as toilet paper or water. In some cases hoarding and absence of prosocial choices have led to dangerous shortages of medically necessary supplies such as masks. Stigma and xenophobia have been fostered by deliberate attempts to relate the virus to its geographical origins, resulting in some areas in a rise in hate crimes against Asian people (Yang et al., 2020).

Public reporting of the virus presence tended to be linked only to the presence of the number who were infected or dead, altering the ways that individuals' personal and social histories relate led to needed preparation and behavior change. The reaction of citizens and government authorities in the United State

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provide a clear example. The presence of the virus in the USA was known and documented since the end of December 2019 (Nextstrain.org December 31, 2020). News about the severity of the disease and its rapid spread in China, Italy and in other European nations was widely circulated in the US media beginning in mid-January 2020. Nevertheless it was only in the second half of March 2020, with the rising number of cases in many U.S. cities, that attention was given to the public health threat of the virus by US federal and state authorities. This pattern had been replicated earlier in Italy, France, Spain, and the United Kingdom. Time and again, national governments reacted with policies advocated by public health officials only when the number of cases in one's own country soared (Yong, 2020).

When a pandemic disease explodes, patients, health professionals, and the general public are under overwhelming psychological pressure. The disease itself and the losses it imposes are frightening and costly but so too are the social and behavioral adjustments needed to combat the spread of disease. For example, multi-week lockdowns have been imposed in many countries to help "buy time" for hospitals to prepare the medical response and for researchers to find a solution to it. A review of the consequences of prolonged quarantines showed negative psychological effects include post-traumatic stress symptoms, confusion, and anger (Brooks et al., 2020). Duration, infection fears, frustration, boredom, inadequate supplies, inadequate information, financial loss, and stigma were identified as the most relevant stressors experienced in prolonged isolation of both sick and healthy people.

While the pandemic is still in its developing stages across the world, first reports are now emerging of its psychological impact in China, the nation in which the outbreak first appeared. It is already clear that it poses a major challenge to psychological resilience. Wang, Pan, Wan, Tan, Xu, et al. (2020) reported that half of 1210 Chinese respondents rated the psychological impact of the outbreak as moderate or severe. Moderate to severe symptoms of depression were reported for 16.5% of interviewed subjects and significant struggles with anxiety occurred for nearly one third of the participants. Three-quarters reported significant worry about family members contracting COVID-19. Early evidence of adverse psychological reactions in healthcare workers is also emerging. In a survey of nearly 4,679 physicians and nurses in 348 Chinese hospitals, Liu, Han, Jiang, Huang, Ma, et al. (2020) reported rates of symptoms of psychological distress (15.9%), anxiety (16%), and depressive symptoms (34.6%). Fear of shortage of health aids, medicine shortages, and continuous requests to adapt to sudden changes in hospital organization added to the obvious psychological pressure produced by the exponential increase of hospitalized patients.

In China psychological interventions have been implemented at different levels from the general population to specific groups. The National Health Commission of China published guidelines, outlining the principles for psychological intervention and how to establish assistance hotlines (National Health Commission of China, 2020). Online mental health education and counselling services and books were widely used for medical staff and the public. Online psychological self-help intervention systems included online cognitive behavioural therapy for depression, anxiety, and insomnia (Liu, Yang, Zhang, Xiang, Liu, et al., 2020). Interventions, including telephone counseling, self-help materials and one-to.one sessions were also offered to COVID-19 positive patients during hospitalization or quarantine (Yang, Wu, Hou, Wang, Dai, et al. 2020).

As the COVID-19 pandemic is developing worldwide, a parallel epidemic of fear and worry is spreading in the countries that are being progressively hit by the virus. High levels of public anxiety is being fueled by the lack of public knowledge about the virus and the disease, the lack of specific medical treatment, the circulation of misinformation, images of hospitalized patients and aligned coffins as seen on traditional and social media, and by the needed but drastic and unprecedented actions being taken by governments world wide (Ren, Gao, & Chen, 2020). The inability of families to be close and support to isolated patients and to those in intensive care units (ICU), can result in further distress, anger, sadness, and resentment, especially in who is mourning the sudden loss of beloved relatives. People are witnessing consequences also at a societal scale: the pandemic is disrupting economies and breaking health-care systems, separating people from workplaces and everyday spaces, undermining modern society on a scale that can be close, or even worse, to that of World War II. Under these conditions, close-minded attitudes and rumors often rise. According to Sylvie Briand, the World Health Organization's (WHO's) Director of Global Infectious Hazard Preparedness, fear and stigma should also be the target of interventions: "…Fear and stigma go together and when people fear, they tend to stigmatize some groups and what we try to do is to reduce this fear" (Leung, 2020).

Fear is a distressing emotion, that occurs in the presence of a danger and is often accompanied by emotional distress and behavioral avoidance. Like any other event that touches human senses and is in our context of experience, we react to fear symbolically, by arbitrarily relating it to other objects and events through derived verbal relations. Language may alter the way we experience events and consequently affects the way we are functionally or dysfunctionally oriented to the world around us, influencing our behavioral patterns. In this paper we will outline the different human learning processes connected to fear responding, from the simplest type to the more complex cognitive ones, approaching them from the point of view of contextual behavioral science (Zettle, Hayes, Barnes-Holmes, & Biglan, 2016) a modern form of behavioral thinking. We will sketch at the end a model of intervention to promote psychological flexibility and more functional value-based actions. We will argue that in a pandemic and in the post-pandemic phase psychological flexibility could be a key for adapting to new and changed circumstances.

Theoretical roots of fear development

Fear is widely regarded as a highly ubiquitous emotion, with obvious functional and evolutionary significance. There is nothing disordered about the emotion of fear or its conditioning basis per se. Aversive learning, specifically Pavlovian fear conditioning, is an established experiential risk factor in the etiology and maintenance of fear (Barlow, 2001; Bouton, Mineka, & Barlow, 2001; Griez, 1984; Mineka & Kihlstrom, 1978). Though numerous theoretical accounts have been put forth to explain the processes involved (e.g., Davey, 1992; Dawson & Schell, 1985; Mineka & Zinbarg, 1996; Öhman, 1996; Hugdahl, 1995; Reiss, 1980; Rescorla, 1988; Wagner & Brandon, 1989), Pavlovian fear conditioning can be readily described in procedural terms: a previously neutral stimulus (NS), after having been paired in a contingency with an aversive unconditioned stimulus (UCS) that reflexively elicits

an unconditioned response (UCR), will change the evocative functions of the NS such that, when presented alone, it functions as a conditional stimulus (CS) that can evoke both subjective and autonomic conditioned emotional responses (CRs) that we typically associate with fearful behavior (LeDoux, 1996; McNally, 1987; Öhman, 1979, 1983).

Even when stimuli are verbal, classical conditioning factors can still apply. For example, a few months ago the word "Corona" was a NS, at least with regard to fear as an emotional response. The words "virus," "illness," or "death" tend to be UCSs that when appear, elicit an UCR of fear. When this pandemic we face is said to be a direct result of the "Coronavirus" fear at hearing the word "Corona" could elicit fearful thoughts, feelings and somatic CRs.

Unlike classical conditioning that presents responses as induced by stimuli that precede the behavior, operant conditioning regards fear as a set of emotional and overt behavioral responses shaped and maintained by its consequences. In this learning process, the likelihood of exhibiting a specific behavior increases or decreases according to the consequences that follow it (reinforcement or punishment respectively). The main premise is that an environmental event or stimulus precedes a response, which is followed by a consequence that determines whether the response is more or less likely to occur again in the future (Rescorla, 1988, 1991; Kirsch, 1985). In the case of fear, a person may hear the news about the death toll as a result of COVID-19 (antecedent stimulus), and emit fearful responses (crying, avoiding watching the news etc.) that are followed by family members providing comfort (positive reinforcement) or decreasing fear (negative reinforcement), increasing the frequency of exhibiting such fear responses (especially ones of avoidance and escape) in the future. Pavlovian and operant Skinnerian procedures can readily combine to enhance these effects.

In addition, some events elicit fear due to evolutionary processes. The social contagion of fear, for example, appears in part to be based on primitive "survival circuits" in the brain, for example, that will elicit fear and avoidance at signs of threat, including other organisms showing fear (Mobbs, Hagan, Dalgleish, Silston, & Prévost, 2015). Social learning processes such as when children react to parents' fearful actions, also play a role, perhaps mediated by neurobiological reactions of this kind (Burke, Tobler, Baddeley, & Schultz, 2010). All of these direct learning processes can be used to elucidate a variety of complex learning processes before, during, and following conditioning that may contribute, in whole or in part, to the etiology, maintenance, and treatment of fear problems (Barlow, 2001).

Fear as an arbitrarily applicable relational responding repertoire

Models of fear conditioning and avoidance discussed so far cannot readily account for avoidance responses that do not have a direct history of experiential learning (e.g., Rachman, 1977, 1991). Relational Frame Theory (RFT: Hayes, Barnes-Holmes & Roche, 2001) is a behaviour analytic approach to language and cognition that attempts to describe how symbolic verbal relations can come to impact human emotion and action. RFT posits that complex human behaviour including language and cognition can be understood in terms of the learned capacity to relate events in multiple ways under contextual control, and to change the functions of related events on that basis. When such contextual control comes to include cues that can be provided based on social whim, the "arbitrarily applicable relational responding" (AARR) that results is referred to as relational framing (see Hayes, Barnes-Holmes & Roche, 2001). Via exposure to the socio-verbal environment humans learn a variety of patterns of relational framing under the contextual control of explicit or implicit conventional relational cues, including coordination (e.g., Vino is the same as Wine)[1], distinction (e.g., 'Ireland is different from Italy'), opposition ('Sick is the opposite of healthy'), comparison ('Water is better than coke') perspective ('I am here and you are there') and hierarchical relations ('COVID-19 is a type of coronavirus'; see O'Connor, Munnelly, Farrell & McHugh, 2017) among several others. To understand the meaning of 'contextual control' and its potentially arbitrary application, consider this example: I tell a child that "COVID-19 germs are worse than flu germs and flu germs are worse than common cold germs" and when I ask 'which is worse, the common cold or COVID-19 germs?' she answers "COVID-19 germs". Her reply is based not on her direct experience of physical relations but on an arbitrary (i.e., based on social convention) contextual cue 'worse than'. She has previously learned to 'relationally frame' stimuli in accordance with the relation of comparison in the presence of this cue and thus when she hears it, she frames COVID-19 and the common cold in this way and derives that COVID-19 is worse. If the "common cold" is something that the child has previously learned to despise, her reaction to "COVID-19" may now be intense, despite the absence of direct experience with regard to it.

This so-called 'transformation of function' effect can be highly useful in many contexts. However, it can also be problematic. For example, COVID-19 is also referred to as the "Corona virus." The popular beer "Corona" shares a name with the Corona virus but of course there are no physical or formal properties that are shared between the virus and the beer. When the Corona virus hit headlines in the United States as a highly infectious disease, sales in Corona beer dropped dramatically. In this case, the relational framing of coordination between Corona (virus) and Corona (beer) transformed the functions of 'infectious' and 'to be avoided' so that people stopped purchasing the beer.

According to Relational Frame Theory (Hayes, et al., 2001) the way in which we verbally relate stimuli may be at the source of a large proportion of psychological suffering. RFT suggests that we learn to relate stimuli in our environment and that this relating can change the psychological functions of those stimuli. Because relational framing can be arbitrarily based on context, transformation of functions across relations can have behavioral implications for humans that are maladaptive and poorly fitted to context. For example, just like the Corona beer started to take on some of the functions of the actual Corona virus so too can talking about a past or potential future traumatic event (e.g., death of a loved one from COVID-19) bring the feelings related to that event to the fore for an individual. With a strong cultural message that undesirable psychological content is a barrier to effective living, this simple transformation effect can create a problem for effectively coping with events that evoke negative feelings such as fear and anxiety based dominantly on relational framing.

In the current pandemic some of key issues that are heightened by derived relational responding are anxiety

[1] Another way to understand coordination is to say of the above example: "vino" is the same as "wine" in Italian.

and fear, disruption to sense of self. and emerging prejudices and discrimination of me/us from them. We will briefly examine each of these below.

(1) Anxiety and fear

Anxiety and fear have been shown to be heightened by arbitrarily applicable relational responding (Dymond & Roche, 2009). A key feature of derived relational responding is that verbal relations of that kind generalize across many different circumstances and situations. For example, when we think of COVID-19 we might have thoughts about anxiety and fear of the disease itself, the unknown, economic disruption and loss of job and what will happen to society. It is unlikely that thoughts occur across such a wide range of circumstances as a result of direct learning about each of those circumstances. According to RFT it is derived relational responding and subsequent transformation of functions that heightens our anxiety as our thoughts generalise across contexts. In a sense we live the realities of those thoughts when we derive them via transformation of functions without the circumstances having to be actually occurring in this moment (e.g., loss of job). That is, words and thoughts alone are able to evoke feelings which subsequently may determine behaviour. For instance, if a person worries about their health, the very word 'virus', or the thought of contracting a virus, may evoke related thoughts and feelings of anxiety and fear. In fact these thoughts can evoke the same feelings as would be experienced when the person was actually sick with a virus. These relations can trigger physical reactions such as anxiety and fear and the underlying neurobiological survival circuits they participate in (Hayes & Hofmann, 2018). For example, hearing someone talking about COVID-19 might evoke thoughts and feelings, as though the sickness were occurring *here* and *now,* in the present, and lead to behavioral mobilization to escape.

(2) Disruption to sense of self

As a result of the pandemic, ongoing separation from normal roles, colleagues, family and concerns about 'future me' (e.g., whether I will be sick / have a job and security, etc) may cause the disruption of our verbal sense of self (McHugh, Stewart, & Almada 2019). RFT offers an account of how it is we come to have a sense of self. Through relational framing we create a narrative about who we are. This sense of self includes descriptions, labels and stories about 'I'. From an RFT perspective, once the individual begins to relationally frame through her interactions with the socio-verbal community, she will thereafter continue to elaborate the network of objects, words, events and concepts that are framed for her both overtly (e.g., in conversation with others) and covertly (e.g., in thinking) and the psychological qualities of her environment will be transformed in increasingly complex and diverse ways. Naturally, her own behaviour and that of other people are a very important part of her world and thus they also become part of this network of relationally transformed stimuli and indeed become a critically influential part of it. From the RFT point of view, this is the beginning of the repertoire of a verbal sense of self.

When the descriptions and labels that we hold about ourselves are challenged this can leave people with a confused sense of self. The current pandemic has resulted in people having to change and adapt their roles with little or no lead in. Imagine an academic who is a mother of four children. She would identify herself as a hard-working colleague and an attentive mother. However, during isolation in the pandemic she finds herself having to mind her children and work from home at the same time. She is not able to make many meetings online that she typically would have attended, which challenges her sense of self as a hard-working colleague. She also does not have the time to homeschool her children which challenges her view of herself as an attentive mother. We should be aware that the pursuit of a coherent sense of self can sometimes be misguided in that, due to its powerful conditioned reinforcement value, we can end up seeking coherence within limited contexts to the neglect of coherent responding in more overarching and potentially important ones. Continuing with the example of the working mother in this case we would want to help the women to gain a broader sense of self that is more than the descriptions she holds about herself or the roles she has in her life.

Chasing a consistent and coherent sense of self can be stultifying. To counteract this process, we need to develop broader repertoires that allow the pursuit of a coherent sense of self in a more functional way. We need an alternative to believing the stories that we hold about our self to be true (e.g., I am a failure) and accepting these absolutes in our thinking about who we are. One alternative is to broaden our sense of self via perspective relations to see that 'I am an observer of my experiences'. Viewing myself as an observer will serve to comprehensively distance myself from the stories and allow me to observe the behaviour of myself and others more clearly. For example, in the case of the woman who holds the stories about herself as an attentive mother and hard-working colleague as 'who she is', it is important that she is able to see these as simply labels that she uses about herself. While the labels might make sense in many ways, they are not all that she is. Viewing 'hard working' as a label rather than who she is will make it less likely that she gets stuck in a trap created by her verbal behaviour.

(3) Prejudices and discrimination

At times of difficulty and crisis such as the global COVID-19 pandemic, prejudices and the discrimination of 'me/us' as different from 'others' can emerge. Just as in the "Corona beer" example, in this pandemic derived functions of the virus can transform the functions of people, countries, and regions in much the same way. A person who has been extremely sick from the flu, and has heard that COVID-19 is far worse might be terrified of COVID-19. Anything else that is in a frame of coordination with COVID-19 might acquire functions of 'bad', 'diseased' or 'dangerous'. For example, referencing the virus as the 'Chinese Virus' sets up a frame of coordination between China and the virus and by derivation a frame of distinction or comparison between people in other countries and Asian people. Such frames of distinction in the language used by leaders and social media to discuss the pandemic can thus easily fuel these prejudices and discrimination. Frames of distinction such as 'It is only old people not young people who get sick' or 'Only people with compromised health die' can easily undermine group unity such as 'We are all in this together'.

The repertoire narrowing effect of fear, anxiety, and worry

It can be useful to conceptualize different states of

threat imminence that can be involved when facing a threatening stimulus, such as the coronavirus. At one end of the continuum is fear, which can be thought of as an attempt to mobilize and protect an individual from immediate and certain danger. At the other end of the continuum is worry, which is a reaction to and preparation for distal, potential threat. Such a conceptualization is consistent with observations from other species-specific defense reactions (Fanselow & Lester, 1988). A common functional purpose of fear, anxiety, and worry is, therefore, to help prepare an organism to confront a threat. This preparation requires a degree of repertoire narrowing. That is its evolved function. The amount of repertoire reduction depends on where the response falls on the continuum just described. Intense fear responses will narrow the range of possible behaviors the most (i.e., in the almost involuntary fight or flight responses that can result), while anxiety and worry will also lead to restricted behavioral repertoires but to a lesser degree.

This suggests that it is important to modulate responses to fit the types of threat posed by a pandemic. During the pandemic most people will experience some increases in fear, anxiety, and worry. Such reactions can be fed by behavioral choices such as excessive media consumption (e.g., frequent and unnecessary examination of the number of new cases), repeated discussions about the potential economic fall-out and the like. The associated restricting in behavioral repertoires can be out of touch with actual contextual demands. various areas. For example, entanglement with near panic-like thoughts could overly restrict physical movement, willingness to eat, self-care, and other behaviors, etc. Thus, while fear and anxiety are natural, in the extreme form they can become dysfunctional and perpetuate themselves via reinforcement "loops." This seems especially likely with behavior regulated by rigid verbal rules (e.g., "I have not contracted the virus yet, therefore what I'm doing [worrying] is working" – even though many factors beyond our control contribute to this). Loops of that kind can restrict engagement in other vitality-increasing activities that are available; thus entanglement with worrying and anxious, can restrict engagement in healthy forms of non-corona focused activities.

Responding flexibly as an alternative

An antidote to anxiety-induced rigidity is psychological flexibility. Psychological flexibility refers to a set of inter- and intra-personal skills that can be defined as the skill to "recognize and adapt to various situational demands; shift mindsets or behavioral repertoires when these strategies compromise personal or social functioning; maintain balance among important life domains; and be aware, open, and committed to behaviors that are congruent with deeply held values" (Kashdan & Rottenberg, 2010). Psychological flexibility has been found to be an important determinant of mental health and well-being and the opposite, psychological inflexibility, is associated with numerous indices of dysfunction and psychopathology (Gloster, Meyer, & Lieb, 2017; Hayes, Luoma, Bond, Masuda, & Lillis, 2006; Kashdan & Rottenberg, 2010). The skills most commonly proposed to contribute to Psychological flexibility are: (1) acceptance and openness to one's experience (vs. avoidance, suppression, etc), (2) cognitive defusion or holding one's thoughts lightly (vs. cognitive fusion and entanglement), (3) flexible attention to the here and now (vs. loss of contact with the present moment or being in an "autopilot" mode of functioning, (4) having a stable and transcendental sense of self (vs. attachment to a conceptualized self), (5) clarification of and living based on deeply meaningful chosen values (vs. confusion about what is important and/or living life in incongruence to what is really important for the person (i.e. values confusion, behaviour discrepant from one's values), and (6) committed purposeful action (vs. inaction, impulsivity, non-functional or persistent avoidant behaving (Hayes, Strosahl, & Wilson, 2012).

Diminished psychological flexibility is a predictor of trauma and mental health problems following such crises as school shootings, devastating storms, or violent crime (e.g., Brockman et al., 2016; Gold, Marx, & Lexington, 2007; Kumpula, Orcutt, Bardeen, & Varkovitzky, 2011). These responses appear to be socially transmitted since parents' psychological flexibility predicts the trauma of their children when experiencing crises of this kind (Polusny et al., 2011). The World Health Organization has found that a self-help program based on Acceptance and Commitment Therapy (ACT; Hayes et al., 2012) that fostered psychological flexibility reduced psychological distress among displaced war refugees (Tol et al., 2020).

Psychological flexibility skills can be brought to bear on the rigid and repertoire narrowing effects of coronavirus induced anxiety and fear. For example, a multitude of stimuli are always available to us at any given moment and the degree to which focus is attended to the available stimuli, anxiety and fear are less likely to guide behavior. A few examples are the sounds in one's home, the feeling of fresh air on one's skin; the timbre of a friend's voice on the phone; the increased breathing and heart-rate (and maybe pain in a limb) when dancing to music; the different taste of cake between the first and second forkful. Likewise, if a person treats their thoughts *as thoughts* (vs. literal truths) and allow the existence of bodily sensations that accompany anxiety (vs. trying to escape one's own skin), research shows that it is possible to break away from the tendency for anxiety and worry to build into more complex problems over time (Spinhoven et al., 2016) . This might require making space for upsetting thoughts (e.g., "I have lost income"; "Someone I love has contracted the virus") instead of avoiding and exacerbating them. The payoff of such steps is that it allows one to then choose how to invest one's time and energy. When this is possible, people can choose to engage in the things they care deeply about, despite the anxiety. This differs from person to person, but often involves things such as helping others, caring for family, competently working, taking care of one's health. Indeed, experimental research on the impact of ACT shows that deliberate cultivation of such skills can lead to post-traumatic growth instead of PTSD following potentially trauma inducing events (Hawkes et al., 2013). Whereas the anxiety elicited by the pandemic will continue to pull for one's attention, psychological flexibility skills can help orient people back to the things that give them meaning. Quarantines will force everyone to adjust how they do what they care about, but psychological flexibility skills may just help one realize that within these uncertain times there is an opportunity to creatively seek out new, perhaps simpler, ways of living a vital life *despite* the corona pandemic.

Conclusions

The COVID-19 pandemic is having worldwide a huge impact with unpredictable psychological consequences. Some of them are directly related to the disease itself and its diffusion, others come from actions

to control it. A recent review (Brooks, Webster, Smith, Woodland, Wessely et al. 2020), for example, suggests that the psychological impact of quarantines is wide ranging, substantial, and can be long lasting. Increased exposure to social media in the context of lockdowns, isolation and quarantine increases the tendency to ruminate over information. Using data from social media Chinese network during the epidemic period, before and after the 19th of January 2020 declaration of the Chinese outbreak, an intensification in anxiety, depression and sensitivity to social risks, as well as a decrease in positive emotions and life satisfaction was recorded (Li, Wang, Xue, Zhao, & Zhu, 2020). Concern for health and family was expressed and less attention was given to leisure and friends.

This outbreak has emphasized the fragility of mental health and the need for the provision of evidence-based interventions to enhance psychological flexibility. When compared to other recent epidemics of infectious diseases, fear is perhaps more intensified now than during SARS period (Ho, Chee, & Ho, 2020). RFT is a behavioral account of language and cognition that offers an explanation of fear and avoidance responses that do not have a direct history of reinforcement. Transformation of function is crucial for understanding them, particularly when combined with existing behavioral principles, such as classical and operant. conditioning. The extensive literature on psychological flexibility (see Hayes, 2019, for a book length review) provides a strong empirical rationale for the use of mindfulness and acceptance based strategies such as ACT to increase psychological flexibility to help people cope with the coronavirus pandemic.

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