Hormesis: the difference between a poison and a medication

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Editorial

As a holistic psychiatrist and integrative psychoanalyst who is dedicated to facilitating deep and enduring change in psychotherapy patients, my commitment is to understanding why patients with longstanding emotional injuries and scars are so often reluctant to relinquish their maladaptive ways of being and doing, even when those dysfunctional behaviors are costing them dearly. Although once necessary and even adaptive, those defenses have long since outlived their usefulness.

My interest in the seemingly intractable – albeit unconscious – resistance to change that such patients demonstrate has prompted me to focus on their "dose response" to the variably stressful psychotherapeutic interventions that therapists will offer in an attempt to incentivize their patients to let go of the deeply entrenched "compulsive repetitions" and "relentless pursuits" that are causing such intense suffering and distress [1-4]. Over the course of time, I have come increasingly to appreciate the transformative power of "optimally stressful" interventions that both challenge and support – the judicious use of which can "provoke" healing.

Indeed, the most powerful tools in the armamentarium of mental health practitioners are these anxiety-provoking – but, ultimately, insight-enhancing and growth-promoting – interpretations designed to make patients more aware of both the price they pay for their refusal to let go of their dysfunction and the investment they have in holding on to it even so. My contention is that just the right combination of challenge (to provoke destabilization of the patient's dysfunctional defenses) and support (to create opportunity for their restabilization at a higher level of functionality and adaptive capacity) is sometimes exactly what the unintentionally resistant patient needs in order to evolve from "less healthy" to "more healthy."

Behind this "no pain / no gain" approach is my firm belief in the underlying resilience that patients will inevitably discover within themselves once they are forced to tap into their inborn ability to self-correct in the face of environmental challenge. Strategically formulated interpretations – custom-designed to provide just the right level of stress – can indeed motivate in this way, resulting ultimately in the transformation of unhealthy "defensive reactions" (like "cursing the darkness") into healthier "adaptive responses" (like "lighting a candle").

Historically, the toxicological literature has embraced a linear no-threshold (LNT) dose-response model, whereby environmental toxins are assumed to be poisonous at whatever their dose. But the hormetic (biphasic) dose-response model, whereby biological agents generally considered harmful (or inhibitory) are found to be beneficial (or stimulatory) at low enough doses, is gaining increasing recognition and popularity. Acceptance of hormesis as a viable alternative dose-response model is largely a result of the meticulous and exhaustive research being conducted by the avant-garde toxicologist Edward Calabrese [5-7] and his colleagues at the University of Massachusetts. Their hypothesis is that the hormetic phenomenon speaks to a system's "modest overcompensation" in the face of threatened disruption to its homeostasis.

Variability of dose response is certainly also relevant for psychotherapy patients, who will react / respond in any one of three ways to intentionally stressful – and, if done right, incentivizing – interventions:

On the one hand, too much challenge, too much anxiety, too much stress will be too overwhelming for patients to process and integrate, triggering instead defensive collapse and at least temporary derailment of the therapeutic process. Too much stress will be traumatizing – "traumatic stress."

On the other hand, too little challenge, too little anxiety, too little stress will provide too little impetus for transformation and growth because there will be nothing that needs to be mastered. Too little stress will serve simply to reinforce the (dysfunctional) status quo.

But just the right combination of challenge and support will generate just the right level of destabilizing stress and incentivizing anxiety, thereby laying the foundation for therapeutic change. The father of stress, Hans Selye [8,9], refers to this level of health-promoting stress as "eustress" and Stark [2-4,10] and others [11] refer to it as "optimal stress."

Like the three bowls of porridge sampled by Goldilocks – one too hot, one too cold, but one just right – so too the dose of stress provided by the therapist's interventions will be either too much, too little, or just right.

In an effort to optimize the therapeutic action, psychotherapists – moment-by-moment – must therefore keep their finger on the pulse of the patient's level of anxiety and capacity to tolerate further stress. Whenever possible, the therapist will challenge (thereby increasing the patient's anxiety); whenever necessary, the therapist will support (thereby decreasing the patient's anxiety). Alternately challenging (by speaking to what the patient "knows" with her head) and then supporting (by resonating empathically with what the patient "feels" with her heart) will enable the therapist to titrate the level of stress being generated and, in this way and over time, to optimize the level of "galvanizing-to-action" internal tension that the patient is experiencing.

Again, the concept is one of precipitating disruption in order to trigger repair, that is, controlled damage to incite healing. With each cycle of disruption (in reaction to challenge) and repair (in response to support), the patient will come increasingly to understand – with both her head and her heart – that she has almost no choice but to relinquish her tenacious attachment to dysfunctional defenses which she now appreciates cause more pain than gain, no choice but to surrender her maladaptive patterns of behavior – despite their erstwhile robustness – in favor of more adaptive ways of acting, reacting, and interacting.

In closing, I turn now to chaos theory to inform our understanding, on a more fundamental level, of both how people change and what must be overcome if they are to do so. When, as is now being done in some academic circles, people are understood to be open, complex adaptive, self-organizing systems with emergent properties that remain fairly constant over time, then their dysfunctional ways of being and doing can be seen as a reflection of the well-known "resistance to perturbation" that characterizes all such complexly ordered systems, be they neural networks, fashion trends, the stock market, or natural disasters [12].

From this it then follows that – against a backdrop of empathic attunement and authentic engagement – a patient must be sufficiently stressed by input from the outside (that is, by optimally stressful interventions that both challenge and support) that there will be impetus (that is, force needed to bring about change) for the dysfunctional status quo of the patient's defenses to be destabilized, thereby allowing for restabilization at a higher level of integration, balance, and harmony.

It therefore behoves those mental health practitioners who are intent upon helping their patients evolve from rigid defense to flexible adaptation to become more comfortable with, and more adept at, offering optimally stressful interventions that generate neither too much nor too little but just the right degree of stress – such that there will be sufficient leverage to overcome the patient's inherent resistance to change.

Indeed, the difference between a poison and a medication is the dosage thereof [13,14].

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