COVID, Mental Health and Interactive Screen Use, Complement or Override:
Mitigating the effects of (i)technology overflow in times of COVID

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As early as the late 1990's the relative negative to positive influence of our i-tech was a primary conundrum as scholars started to examine the emergence of pathological usage patterns (Orzack,1999; Shaffer, 1996; Young, 1998).

What I have learned over many years of hands-on research and data mining is that there is a plethora of socio-emotional and cognitive effects that expand far beyond the young, morph faster than a generation of iphones, and the impacts on our biology, and hence psychology too, are ever evolving (Swingle, 2014/16; 2019aa). But there are a few constants. Now that the majority of the Western world has increased its dependence on i-tech due to the imposed restrictions of COVID-19, being aware of these constants and their effects on our mental well-being is most important.

First, many of the concerning issues and mental effects are directly related to usage patterns (Swingle, 2013), pre-existing clinical and sub-clinical conditions (Caplan & High, 2011) and epigenetic factors (Swingle, 2019a). A good way to summarize this is: Problems do not arise from whether we do or do not use i-tech

but rather a combination of how, and why, we use it. This includes how often, how long, how young, and if we use our i-tech as a complement rather than an override to other embodied interactions (e.g., in schooling, parenting, socializing, entertainment, partnership and work).

COVID demanded mass logistic and functional adjustment and i-tech was ready. Within a matter of months, if not weeks, there was a comprehensive shift from in person interaction to digital interaction wherever and whenever possible. For vast swaths of the Western World, i-tech soon was no longer one of many mediums, a facilitator and a complement to work, entertainment, and school. It was work, entertainment, and school. The technologies were primed for this, and, apart from a few wonky backgrounds, zoom bombs and pant-less people much went off without the glitches one might expect from such a massive shift. Or did they?

Part A: The Imperative of Balance – Integration Versus Interference.

Central to many discussions on the benefits and harms of i-tech is the concept of balance. Balanced and purposeful usage is arguably non-problematic having many positives that outweigh the negatives. Balanced use is Integration. Use fits with modern life. Specific applications were/are adopted or replaced other methods due to superior efficiency, facility, or an ability to expand a desired trait. It does not override or eclipse the development, or maintenance, of other (healthy) behaviors, or relationships; it complements them. In contrast, unhealthy or unbalanced use is Interference. Here a technology, or its use, overtly or covertly eclipses, overrides, or rewires desirable states and traits and contributes to dysfunctionality and lack of mental as well as physical wellness (Swingle, 2014/16). It is not in balance with the physical or embodied world, biology, or

free will. Before COVID many of us from both a personal and cultural/societal perspective were struggling with balance, dancing on tipping points between integrated application and interfering use. Then COVID gave us a good push. Not all of us landed on our feet, or on the same side.

One factor that may have contributed to integrated versus interfering usage of i-tech is differential experience. The reaction to COVID did not affect us all the same: Many living alone, newly unemployed or out of school were reporting feeling increasingly lonely, devoid of purpose, proximity and touch. Many living together were expressing feeling cramped, smothered, overwhelmed with multiple compounded tiers of responsibility, desperately needing space, escape, distance and the relative calmness provided by the physical separation of a daily work-home-school routine. Still others, particularly those on the frontlines were feeling flooded on all fronts sacrificing selfcare for duty. There were some who found a way to take advantage, basking in previously lacking interpersonal family and solo time, but they were in the clinical minority and usually those of spatial and monetary privilege. These distinctions of experience predicate that bifurcations in i-tech use during COVID were/are not so much of specific online behaviours, and activities, per se, but of their purpose.

There are three classifications of Interference. 1) When i-tech *Functions as a tool of negative magnification or negative transformation: Use facilitates, accentuates, or accelerates a negative or previously neutral behaviour.* [The technology is no longer a neutral tool]. 2) When use *Alters a natural social behaviour, or natural drive to an unnatural dimension* [The medium replaces formerly embodied human relationships e.g., physical/contact sexuality is replaced by exclusive porn consumption] and 3) An *acceleration of a behaviour to the realm of obsessive-compulsiveness… when a person continues with a behaviour* [e.g., compulsive searching, watching

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or texting] *long after the purpose of the original quest has been fulfilled* (Swingle 2014/16). All are relevant to discriminating interfering behaviour and can compound. Classification three, however, is most relevant to our current unsettled times.

Continued use under the third Interference condition is due to an internal confounding of primary and secondary purpose: i.e., the confounding of cognitive (information seeking), social (communication and belonging) and affective soothing (emotional mediation) wherein, in short time, the latter supersedes the former two. Goal orientation and duration of activity here are also both relevant.

The affective function of excessive i-tech use has been explored extensively in multiple works of Caplan and High. Their body of work found that individuals use i-tech for two purposes: to regulate against potentially anxious mood states and to mitigate existing ones. Turning to screen mediated interactions to mitigate or alleviate affective distress, however, is a dysfunctional strategy; a momentary decrease in affective distress is followed by subsequent exacerbation. Individuals also develop increased, rather than decreased, deficiencies in self regulation (inability to manage moods) and cognitive preoccupation with the medium, i.e., obsession and inability to detach (Caplan & High, 2011).

In times of COVID, the line between seeking connection and using i-tech to effect such (healthy) versus using the modality to alter/affect mood state (not healthy) is blurring. The line between being alone and being lonely (with imposed, as opposed to selected), isolation is also increasingly obscured. As such, I believe both clinicians and their clients, as well as those not seeking psychological services would benefit from further behavioural insight.

Which brings me to the second and third constants. There is a very strong correlation between excessive and otherwise inappropriate i-tech usage, and anxiety, depression and the OCD spectrum. What I call 'The Big Three'. (See overviews,

Swingle, 2014/16; 2019aa). Again, not with all use but certain forms of use (Swingle, 2013). The third constant is highly aligned with the second: Excessive and/or inappropriate usage is highly associated with psychological or psycho-social instability.

These three constants, differentiated COVID related experiences, and diverse and distinct mental health baselines, may all be key variables and determinants of healthy versus unhealthy i-tech usage patterns. They may independently or concurrently determine individual affective reactions. Use that contributes to wellness, and lack thereof, therefore, I argue is better observed empirically. and with stochastic measurement.

The early and current literature is fairly consistent finding excessive or inappropriate i-tech usage a fulcrum point for declining mental health. Individuals who are, or become drawn to, excessive or inappropriate usage are often suffering from some form of sub-clinical pathology and/or psycho-social difficulty (Caplin & High, 2011). Loneliness, perceived need for escape, and ease of availability are considered primary risk factors wherein seeking solace in online activities/behaviours is the primary behavioural stimulus (Ibid; Shaffer, 1996). Turning to i-tech as opposed to friends, family or professionals, however, is highly associated with exacerbation rather than alleviation of the symptoms and sentiments that draw an individual to the need for escape and/or seek connection in the first place. (See body of work of Caplan et. Al., including Caplin & High, 2011; Caplan, Williams & Lee, 2009; Greenfield, 2015; Turkle, 2102; Twenge, 2017; Swingle; 2014/16, 2019a). What also should not be ignored in the current world politic are mounting sentiments of disenfranchisment. Feeling disenfranchised, or belonging to a disenfranchised group, is also a prime risk factor (Swingle, 2013).

So what to do when turning to family and friends is limited or only available via the medium that is potentially problematic? What to do in an environment of great individual and societal unrest when the ability to seek

in-person professional assistance is either not available or overtly discouraged while online activities and connections are? Here we have a clinical Catch 22 or, if you prefer another analogy, a perfect storm.

Many of us in the mental health professions postulated early in our first lockdown that, in addition to the physical threat of COVID, emotional unrest and emotional deregulation were bound to increase in both clinical and general population(s). Previously tributary declines in mental health had potential to become a serious, if not equal, threat to individual and collective health. What ever our individual and family circumstances, many of us, if not most of us, (in clinical and non-clinical populations) were feeling overwhelmed with emotions and uncertainty lending a certain urgency to understanding what specific behaviours contribute to exacerbating unrest versus relative maintenance of wellness.

Keeping in mind that each individual baseline and compounding circumstances may be unique, there are behavioural orientations of usage that decidedly help versus harm. The first is goal orientation.

Goal Orientation: Using i-tech to bridge personal and professional connection can have great benefit. From Zoom meetings, to Doxy tele-sessions and COVID cocktail hour with friends, screen interactions permit a sense of continuance of work and socialization. They limit disruption, and thus lend a sense of control. Similarly, using i-tech to maintain or (re)establish purpose and belonging for oneself and for others is arguably 'good' usage. Activities that help are reaching out to family and friends one used to be able to meet with in person or taking time to reconnect with those one has lost touch with (being too busy in other times). Equally, staving-off restlessness, time voids, and boredom with self-entertainment and social interaction by taking previously embodied interactive hobbies online (e.g., book clubs, exercise classes and choirs) are all good i-tech applications. Pivotal, however, in why these applications can be classified as contributing to health, as opposed to lack thereof, is each has a specific goal-oriented purpose. A second factor in all these activities is shared experience. Whether with a work acquaintance or your best friend, shared experience serves to foster, maintain, or otherwise secure belonging. This second positive however presents with limitations.

Social Capital, Community and Belonging: Digitally mediated experience has significantly less social capital

when compared to embodied experience. It should therefore be considered a stopgap rather than a long-term solution or substitution to in person meetings or gatherings. A second factor critical in calculating the extent of benefit of online gatherings is group size. In the game of numbers, once a group becomes too large, participation can become a depersonalised experience. Larger embodied gatherings that contribute to well-being, sense of community, and belonging, incorporate other components such as collective laughter, song, dance, and tribalistic vocalizations which all trigger physiological response serving to unite a group (SEE MULTIPLE WORKS of Dunbar).[1]

A solution is to layer the meeting experience and avoid unilateral top-down presentation. Small break-out rooms/ sessions within larger meetings appear to mitigate negative or neutral larger group effects. They permit individual attentional factors and interpersonal detail that make an individual feel they matter within a collective. Smaller groups within a larger group screen-event appear to foster both group cohesiveness as well as individual belonging. Anecdotal reporting suggests that these types of structural changes may be a key difference between a personalized group experience versus a depersonalized collective one. Systematic research, rather than individual reporting, would help to further understand to what extent personal characteristics and/or group characteristics and structural components contribute to variation in affective response.

Tricks and tweaks of online activities however cannot replace one-on-one face-to-face, heart-to-heart, and larger embodied community interaction. In the big picture of our well-being, we are a social species that requires active links to other human beings. Interaction with stronger ties (e.g., friends & family) and weaker connections (e.g., familiar faces in the community) are both predictors of subjective well-being. They have been found to be of equal importance and are predictors of belonging (Sandstrom Elizabeth Dunn, 2013; 2014). In our new COVID reality we have substantial interaction loss. Online meetings, no matter how they are tweaked, layered, or broadened may not capture water cooler style talk or the little lift one gets from the smile from the counterperson at the coffee shop across the street from the office. With our current focus on functional work connection and major social connections,

1   There is one relevant exception: belief--specifically, religion and by extension politics. This is a whole other topic on to itself and hence beyond the scope of this paper. But it should be duly noted, especially in the current world politic.

the value of secondary connections is underplayed in our feelings of belonging and community. All forms of social capital contribute not only to a physical support network but a psychological one.

Part B: Lost in Translation

The Role of Psychophysiology: Online experience is fundamentally different from embodied experience. The reasons for this are often purely psychoneurophysiological. We do not have, or get, the same biological response(s) to screen-based experience as we do to embodied experience [2] or they are notably altered.

A prime reason for this is the muting of sense perception. Here muting refers to the transfer of less, lesser, or different information for the brain and therefore the body and person to process. Digitally mediated experiences inherently have information gaps as well as reduced clarity of messaging. In other words, we have less to process and what we do process is less reliable. I postulate the brain thus fills in the sensory input blanks and/or becomes unsettled with the lack of cue input.

From subtle blushes to variation in pupil dilation, perspiration, breathing patterns, minute mouth twitches, smirks and swallows, standard subtle physiological variations are either not read or read poorly via screen interface. Reduced ability to read these usually present subtle cues and smaller expressions deamplify the transmission of affect and thus the ability to read/feel and transmit feeling and other non-verbal meaning. This can result in neutralized experience, negative experience, and projected misinterpretation. What some clients have described is a feeling of discomfort with a missing piece, or longing for something not tangible. Much like the fidelity of sound of which most of us are fully cognizant of when it fails, here we have lack of fidelity of affect. Contributing to disquiet, loss of affective interpretation can be destabilizing as it is a largely unconsciously interpreted/ processed. Screen size, speed and feed quality can lessen or augment the 'volume' of perception to some extent but in large part all remains muted.

A compounding factor, or not so odd little factoid, is that many of us spend a significant amount of time looking at ourselves rather than at other(s) while on screen interface. This is not necessarily vanity or screen-based narcissism, just a very unnatural medium-based visual awareness of self and therefore preoccupation with self when faced with self. Needless to say, if we are looking at, reacting to, and adjusting ourselves for the camera, we are significantly reducing our attention to others and our abilities to perceive or receive what is already somewhat muted by the medium. This includes both facial cues and voice prosody. This can be easily mitigated if one removes one's ability to see one's own image after set up or otherwise blocks the capacity to see oneself.

Other modalities have similar limitations. Texting, in particular, tends to be completely devoid of affective meaning. Texting is just fine for the brief functional messaging it was originally designed for, but not so much for the way most of us now use it. The condensed form of micro-communication (reductionist construction and grossly reduced phrase length) strips communication down to bare essentials thus requiring affective interpretation on the part of the receiver. Enter the emoji (e.g., winky for sarcasm, smiley for warmth or humour), emotive acronyms (e.g., lol & ROTFL) and character manipulation (e.g., boys vs boyz or listen vs LISTEN, etc.). All these serve to fill in affective blanks providing a second embedded layer of communication or as Chatfield (2015) stated: stage direction. Here layered communication is arguably required because the simple format is often insufficient.

Returning to physiology, in texting the reductionist format and inconsistencies in expected versus delivered temporal sequencing, also affect anticipatory cycles. Thus the modality itself can contribute to anxiety and generalized feelings of disquiet. Here solutions are easy. In times of unrest such as COVID, supplement your texting or replace your texting with voice calls wherein temporal sequencing is governed by pre-established and stable cultural and linguistic norms. In voice calls, affect is evident by speech patterns and silence / non-response holds meaning whereas it may, or may not, via text. Affective interpretation is also facilitated by voice prosody and utterance patterns. There are lessons here beyond COVID times. When COVID restrictions are lifted do consider more embodied interactions. Silence in person (versus text or voice call), can have very positive features and, in contrast to texting or voice call, can be a sign of increased rather than decreased comfort unique to shared experience and relationships of belonging (e.g., sitting watching a sunset

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2   Consolidating this is a main objective of VR research and development.

together in silence).3

Sound Fidelity, Voice Prosody and Attention: At risk of sounding like a luddite, if you still have a landline, use it. --And consider your call / reach-out, your primary purpose. Divided attention (albeit now the norm) reduces the intimacy of voice calls. Calling while driving, tending to work or household tasks, and even walking can reduce the perceived value of the interaction as well as mute affective perception (as outline above). There may be exceptions, such as cooking together, but this would be under the differentiated classification of shared experience. Also be aware of the effect/affect of sound fidelity. Stop-start, echo, intermittent freezing, voice-image synchronisation issues, and volume inconsistency contribute to arousal variation. These can raise distress and/or lower attention. In sum, varying levels of communication fidelity also interfere on affective level(s). In person, communication (verbal and non verbal) is a consistent (reliable) flow of information for all neurotypical and fully-able (non-hearing and non-visually impaired) individuals.

Overload: In the last section, I reviewed the affective processing deficits of screen-based interaction. Now I will switch to its polarity: Overload. Affective overload can equally contribute to lack of well-being. Once again, the issue involves pacing and its ability to manipulate arousal. It can also influence cognitive processing. Attention levels and information load in screen use are guided by many factors including activity choice, platform choice, program choice, and search engine. Platform dependent, our use is steered by varying levels of passive or active engagement. There is also pseudo-passive engagement wherein decisions are guided, if not made for us, by algorithms based on data determinants (previous patterns of use). Games, Facebook, YouTube and other news, information, commerce, and entertainment search modalities (e.g., engines) function under additional user-developer strategies than those found in meeting, text and facetime exchanges. Medium

here, is critical in a program or product's inherent ability to manipulate arousal. Some mediums' function rules (arousal determinants) are incapsulated within a specific program (e.g., a gaming program) while others rely on algorithms to guide and manipulate consumption patterns (including content choice, speed, attention and duration of activities). All this has an affective price. It also has a purely financial one.

Entraining Attention: Our screen engagement is the financial foundation of both the information and entertainment economies which, in turn, fuel the attention economy. They function on a base principle wherein maintaining screen consumer arousal, ensures continued engagement. For this to work, individual (and collective) arousal must be manipulated to keep individuals continuously and consistently engaged with various screen-based devices. It is a fully circular cycle: Our engagement is monitored (cookies, smart readings, etc.) and produces vast swaths of individual as well as collective data. This data (the true commodity) is then commercialized. It is monetized for multiple and precisely refined purpose(s) (e.g., product placement/promotion, political influence, etc.). This is the basis of the Attention Economy (Davenport & Beck, 2001; Swingle, 2019a). In the digital world, data collection (and sale thereof) is now more valuable than product and service charges.

Biological Cost: The mechanisms / effects of the attention economy, however, have another cost. As biological beings we have evolved over thousands of years to function with varied levels of functional arousal and quiet throughout an environmentally established, typically 24-hour, circadian cycle. Continuous (heightened and extended) hyper stimulation (arousal) is relatively new in human history. Until recently it was usually triggered only by imminent threat such as war or natural disaster wherein an individual must stay aroused to facilitate survival. Be it war or i-tech, consistent unrelenting hyperarousal can reek havoc on physical and mental homeostasis. From the amygdala, to the adrenals, we remain on functional biological alert and hence altered (emergency) brain electrical-chemical circuitry. We burn out or alter. Attention can only be sustained so long without causing deregulation (Small &

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3   Again beyond the scope of this paper, some conversely find comfort and power shielded behind a screen. They further explicitly use it to control temporal sequencing, affect, and language to their advantage fostering alter-ego like personality characteristics not present in embodied interaction. See Disinhibition Effect and body of work of Delmonico et, al.

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Vorgan, 2008; Swingle, 2017a; 2017b; 2019a; 2019b). When arousal is too high or sustained for long periods just below maximum threshold, our biology must adjust in order to sustain said attention. Developmentally it interferes with vestibular system function. Cognitively it interferes with inhibition and judgement. Emotionally it interferes with the regulation of arousal (mood) which can develop into hypo or hyper arousal and/or higher baselines for depression and anxiety (Small & Vorgan, 2008; Swingle, 2019a). It also interferes with sleep (Walker, 2017).

Information Overload: Constant barrages of information (Twitter, texts, Facebook, COVID and US political news on TV, as well as our own searches), feed hyperarousal. Both the format and the features of presentation contribute to the heightening of arousal by continuously seeking to stretch the boundaries of our attention. Many platforms and mediums use multilayered and multidimensional complex features to keep us engaged: search engine, page, click, flash, shift, and scroll design; Bing, YouTube, and Facebook links, etcetera, as well as television. Many news programs will now have a presenter interviewing three people simultaneously, two breaking news feeds, and a response feed streaming below--all on colour blocked highly graphic and often moving background(s). Back to the 'rules' of the attention economy, these forms of presentation esteem attentional factors and affective reaction, over information features overriding the value, and efficiency, of information transmission.

Processing: This constant barrage of high-paced, embedded information overload of our senses, has a second caveat. It leaves screen consumers little or no time to pause, think, and most importantly integrate information. It leaves no space to derive or reform independent conclusion(s). This ability to process information is not only key in mitigating affective reaction(s) it is crucial for cognitive processing. We need opportunity to reflect and assimilate information on both cognitive and affective levels before consuming more. A good analogy here would be the digestive system: The human body needs to pause after eating while the stomach empties and the intestines work to separate nutrition from excess and waste before we fill ourselves up again, in theory, in 4, 6 or 10 to 12 hours. Back to screen consumption: when we don't, or are not able to pause for integration to occur, we can be left with sentiments of befuddlement, lack of (free) will, lack of control and lack of choice, all potentially contributing to affective distress. We can have fight, flight, or freeze

effects from our lounge chairs and couches as opposed to entering an analytical mode necessary to make informed choices. Lack of processing can also fuel an informational echo chamber. (See note above on religious and political belief).

What to do? If you want to mitigate against hyper-arousal and anxious states break the engagement and therefore the arousal cycle. Pause, fully disengage, and set consumption limits. News tends to be systematically recycled with a lot of hype and surprisingly little new information just different delivery mechanisms (e.g., a different host, guest, or location) and different audio-visual components which can trick the brain into constant arousal continually scanning for something new or novel. Even in times of great change and/or need for information, most individuals can consume news once a day and be relatively up to date on the necessary information as opposed to falling for the traps of superfluity.

We are full circle back to Integration versus Interference and the need to recognise when objectivity becomes clouded or compromised. When a screen-based activity ceases to be motivated by a specific social, cognitive, material, or entertainment goal/drive, and is used for affect mitigation it ceases to be a beneficial or neutral tool. (Swingle 2014/16; Caplan & High, 2011). Here again a little developmental biology may help clients understand why regulating their screen-time during times of stress, fear and the unknown can be so important for the maintenance of mental health.

Part C: Biological Interference – Mismatched technological evolution and biological evolution.

Despite Kurzweilian optimism (2005) regarding our NEAR-future ability to transcend our biology through technology, many of our current issues stem from the incongruity in the interface between them. As things currently stand, our i-tech is both outpacing and lagging behind our biology. We are out of phase.

Outpacing: Sensory Output
On many levels we can't biologically keep up with our i-tech; hence our deregulation. Here a central contributor to affective dysregulation is how we manipulate our screen-tech to function on a significantly higher delivery pace (frequency, speed, and intensity) than our biology can comfortably manage.   Our biological processing

capacities (senses regulating our socio-emotional and cognitive processing) are thus easily pushed out of phase if not coherence. This is critical in early development (e.g., vestibular system and attention thresholds) and disturbing thereafter.

Lagging Behind: Sensory Input.

Both the sympathetic and parasympathetic branches of the autonomic nervous system function via sensory input. The way they compete and collaborate interpreting signals determines not only our states (e.g., homeostasis, hyper and hypo arousal) and traits (e.g., anxious or depressed presentation) but our mental health and generalized well-being or lack thereof.

Much of what our nervous system processes vis-a-vis social engagement / social communication is transmitted by facial expression and vocalisation, and our attention to them. We (biologically) depend upon our ability to interpret them (ability to see/perceive and listen/hear). All is filtered by the myelinated vagus (in the brainstem) which thereafter sets off a physiological chain to establish both the base state from which we function, as well as the manner in which we react. The system is primed in early infancy and central in both developing and refining brain circuitry that teaches us fear-safety, security and belonging (Porges, 2011). It is a building block of attachment (and attachment theory). When sensory input is compromised, so too is the 'interpretation' of the physiological chain.

Competition versus Cooperation

To date much of i-tech is outpacing, lagging behind, overshadowing and hijacking, rather than piggybacking on and fulfilling, biological need. Another obvious limitation of (most) i-tech to date is touch. Touch is one of the most important biological messaging systems and is highly implicated in psychological well-being. It remains important throughout the life cycle protecting us in many ways. Touch embodies social support and is a means to

cope with and process stress. It has also been found to modulate the effects of both physical and emotional pain. Embodied support defends against threats on multiple levels (Field, 2001; 2010; von Mohr, Kirsch, & Fotopoulou, 2017; von Mohr, Crowley, Walthall, et. al, 2018). The absence or loss of touch for individuals (particularly the elderly and those living alone) cut off from friends and family due to COVID restrictions should not be underplayed. Screen connection here is not a sufficient substitute. Although it can bring some comfort and familiarity, some individuals can be left with a greater sense of lack of human connection and lack of fulfillment. Something inherent is missing. After screen encounters some can be left with a feeling of longing rather than satisfaction (Swingle, 2019a).

In sum, much can be gained and lost in digital connection and unilateral i-tech dependency. Our i-tech has demonstrably proven it can rise to the occasion and function almost seamlessly as a much- needed, all-encompassing tool keeping us all physically safe, emotionally stable, and functionally connected as the COVID storm passes. But it can also be a catalyst for harm. In the extreme it can feed public hysteria, paranoia, fear mongering, ostentatious disregard and harmful behaviours. It can also potentiate individual private suffering including anxiety, depression, loneliness, frustration, fear and anger, helplessness and hopelessness. It all boils down to how we use and wield the tool. It is not if we do or do not use i-tech; it is how and why we use it.

Being fully cognizant of social, functional, and biological limitations as well as biological-technical competition can go a long way towards successful bridging though these most difficult times. Our awareness will also give us much needed insight when deciding what aspects of the technological shift we wish to maintain, versus shelve, when embodied alternatives are once again possible. These are good things to keep in mind long after the imminent threat of COVID-19 dissipates. <<

REFERENCES:

Caplan, S.E. & High, A.C. (2011). Online Social Interaction, Psychological Well-Being, and Problematic Internet Use. In K.S. Young & C.N. Nabuco de Abreu (Eds.), Internet Addiction (pp.35-54. Hoboken, NJ: John Wiley & Sons.

Caplan, S.E. (2010). Theory and measurement of generalised problematic internet use. Cyberpsychology and Behaviour, 10, 234-241.

Carnes, P., Delmonico, D., Griffin, M.A., & Moriarity, J. (2007). In the shadows of the net. Center City, MI: Hazelden.

Chatfield, T. (2015). Netymology: From apes to zombies: A linguistic celebration of the digital age. London, UK: Quercus.

Cooper, A., Delmonico, D.L. Burg, R. (2000) Cybersex users, abusers and compulsives: New findings and implications. Sexual addiction and Compulsivity, 7, 5-29.

Davenport, T.H. & Beck, J.C. (2001). The Attention Economy. Boston, MA: Harvard Business Press.

Dunbar, R. (2007). The Social Brain Hypothesis. In. Evolution of the Social Minds. Eds. J. P. Forgas, M G. Haselton, W. von Hippel (Eds.). (pp. 21-28). NY, NY: Psychology Press

Dunbar, R. (2014) Friendship. New Scientist., 2970, 34-36.

Field, T (2001) Touch. MIT Press: Cambridge, MA

Field, T. (2010). Touch for socioemotional and physical well-being: A review. Developmental Review, 30(4), 367–383.

Greenfield, D. N. (1999). Psychological characteristics of compulsive internet use: A preliminary analysis. Cyberpsychology and Behavior, 85(4)403-412.

Greenfield, S. (2015). Mind Change: How Digital Technologies are leaving their mark on our brains. NY, NY: Random House.

Kurzwell, R. (2005). The singularity is real. Penguin: Ny, NY.

Orzack, M.H. (1199). Computer addiction is it real or virtual? Harvard Medical Health Letter, 15(7), 8.

Porges, S.W. (2011). The Polyvagal Theory: Neurophysiological foundations of emotions, attachment, communication and self-regulation. NY, NY: Norton

Sandtrom, G.M. & Dunn, E.W. (2014). Social Interactions and Well-Being: The Surprising power of weak ties.). Personality and Social Psychology Bulletin, 40(7) doi.org/10.1177/0146167214529799

Sandtrom, G.M. & Dunn, E.W. (2013). Is Efficiency overrated? Minimal social Interactions lead to belonging and positive affect. Social Psychological and Personality Science, 5(4).   doi.org/10.1177/1948550613502990

Small, G & Vorgan, C. (2008). iBrain: surviving the technological alteration of the mind. Harper Collins: NyYNY.

Shaffer, H.J. (1996). Understanding the means and objects of addiction: Technology, the internet and gambling. Journal of Gambling Studies, 12(4)461-469.

Swingle, M.K. (2013). Electroencephalographic Patterns of Internet Addiction. PhD Dissertation. Fielding Graduate University.

Swingle, M.K. (2014/2016). i-Minds: How Cell Phones, Gaming, and Social Media are Changing Our Brains, Our Behavior & the Evolution of Our Species (2014 Portland, IWP / 2016 Gabriola, New Society Publishers).

Swingle, M.K. (2017a). Gaming Addiction. Biofeedback, 45(1) 14-18.

Swingle, M.K. (2017b). Internet Addiction: The Effects of Constant Connectivity on the Brain and Behaviour. Biofeedback Federation of Europe, Aviero, Portugal.

Swingle, M.K. (2019a). i-Minds (Second Edition): How and Why Constant Connectivity is Rewiring our Brains and What to Do about It. Gabriola, BC: New Society Publishers.

Swingle, M.K. (2019b) The State of Quantitative Electrophysiology in Psychological Treatment: Understanding Clinical Research and Practice with Electroencephalography (EEG). Section Features Speaker Canadian Psychological Association 80th Annual Conference. Halifax NS, Canada.

Turkle, S. (2012). Alone Together: Why we expect more from technology and less from each other. New York: Basic Books.

Twenge, J.M. (2017). iGen. New York: Simon & Schuster

von Mohr, M., Crowley, M.J., Walthall, J. et al. (2018). EEG captures affective touch: CT-optimal touch and neural oscillations. Cognitive Affective and Behavioral Neuroscience 18, 155–166. https://doi.org/10.3758/s13415-017-0560-6

von Mohr, M., Kirsch, L.P. & Fotopoulou, A. (2017). The soothing function of touch: affective touch reduces feelings of social exclusion. Scientific Reports 7(1). https://doi.org/10.1038/s41598-017-13355-7

Walker, M. (2017). Why we sleep. NY, NY: Scribner.

Young, K. (1998). IA: The emergence of a new clinical disorder. Cyberpsychology & Behavior, 1(3), 237-244.