The Challenge of Self-Mastery in “The Future of Work”

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Abstract: The acceleration of technological change due to Industry 4.0 causes a need for new features of old virtues. Recent discoveries in neuroscience and in cognitive behavioral therapy complement classical virtue theory, especially that of Aristotle and Aquinas, to offer new scientific appreciation for classical virtues and more effective strategies for their acquisition. Self-mastery requires the ability to maintain focus on the task at hand in accord with one’s commitments by avoiding rumination, intrusive thoughts, and distractions. Mindfulness, positive psychology, and neuroscience complement the recent philosophical study of the virtues of acknowledged dependence (MacIntyre) and offer strategies for embracing stress for personal and community growth through work within teams shaped by shared goals. The freedom to focus in accord with personal commitments can both contribute to and benefit from the shared goals of a team that is shaped by a common hope.

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1. Industry 4.0

Across disciplines of learning, many recognize today that we are amidst the fourth industrial revolution. The idea of Industry 4.0 arose in German technical terminology among large, high-tech industrialists around 2010. The concept coalesced in 2013 when the German Federal Government formulated Industry 4.0 as a strategic economic goal. Large technological industry innovators recognized the opportunity for the accelerated development of integrated networks to sustain a new phase in economic and social development. Today, the European Commission sponsors a strategic initiative to promote the international project of digital transformation to achieve a specific set of goals by the year 2030.²

By assigning the number 4.0 to this new industrial revolution, innovators purposefully fostered historical contextualization by looking both backwards and forwards. In addition to specifying future goals, Industry 4.0 considers the history of technological innovation and enumerates the major milestones of industrial production throughout human history. The first industrial revolution came in the late 18th and early 19th century. It relied upon the steam engine and, by leveraging the characteristic cotton gin and the railroad, began to move economic production from the fields to the factory and shifted labor from manual work to manufacturing processes. The second industrial revolution, characterized by the automobile industry, began in the second half of the 19th century. It accelerated in the early 20th century with its reliance upon electrification, the assembly line, and mass production. Beginning in the late 1960's, the semiconductor enabled digital, electronic control systems to ignite the third industrial revolution which rapidly advanced the automation of manufacturing, transportation, and a myriad of

complex systems from nuclear power plants and fighter jets to clock radios and home air conditioning. With this third industrial revolution, information became more and more actively embedded within the operation of machines in such a way that they began to resemble humans by sharing embedded features of human intelligence. The fourth industrial revolution, like its three predecessors, now promises not only an acceleration of efficiency, but also an acceleration of the acceleration of customization—and interconnectedness. It will affect, thus, the points wherein producers, products, and consumers mix and even blend through the networked, real-time integration of personal choice and data to achieve highly complex, integrated systems that rely upon the actively dispersed “cloud” collection of both knowledge and calculation. Car sharing services are just one example of such highly complex systems of integrated knowledge, calculation, and machinery. It involves “artificial intelligence” while incorporating a multitude of technologies to surpass traditional notions of ownership while offering an easy to use service at a low cost for many.³

2. Acceleration of the Acceleration and COVID’s Contribution

With respect to degree, intensity, and speed, and in comparison to the previous three revolutions, the 4th revolution has already, in just a few years, effected a much greater impact upon humans with regards to our self-awareness and our networked relationships of acknowledged dependence.⁴ Indeed, the “acceleration of the acceleration” of the pace of change throughout human history, with respect to connections between economics, politics, and personal

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3 “Artificial intelligence” is a controversial concept. I use it here simply to indicate a machine's emulation of human knowledge and calculation.

lifestyle, symmetrically corresponds to the acceleration of the acceleration of change with respect to personal identity in community. Nowhere is this accelerated transformative change more determinative of our identity than in the most vital area of work. Indeed, with each industrial revolution comes a transformation of how most of us engage in our productive livelihood, whether within the home or outside of it. Within the current industrial revolution, once again, work is the touchstone for appreciating the importance of the transformation and, therefore, also for predicting the impact upon our very humanity.

As I began to work on this paper, SARS-CoV-2 had not yet been discovered. Now, in the midst of the COVID-19 pandemic, the acceleration of the fourth industrial revolution has sped up once again in its rapid movement towards greater global networking of the internet of things (IoT), machine to machine communication, and the multiple layers of interfacing of networked machines and humans. The transformation of our conference on “The Future of Work” from a localized setting for face to face communication to digital encounters mediated by bandwidth, screens, and microphones symbolically exemplifies the acceleration of the acceleration that can occur in living systems and most especially in those systems that are informed by the human capacity for creative knowledge that allow for inventive, transformative leaps in quality that condition our identity as humans. Instead of requiring airline transportation and hotels, our conference will depend on remote videoconference technology. Perhaps none of us participants desired this transformation but we must all find ways to adjust our expectations and our activity. All of these adjustments will lead to new habits regarding our interactions with machines, our relationships with others, the cohesion of our communities around a shared

mission, and our own personal identities. An even greater socioeconomic transformation is underway as pressure builds on a shrinking middle class. As the move to remote work accelerates, and, if recent predictions are verified, people will move from densely populated urban centers to more rural areas.  

The experience of a global pandemic with its concerted confinement of billions of people, all within the context of an accelerating industrial revolution, offers an exquisite opportunity to reflect upon the meaning of work and the challenge to work virtuously and well. The central feature of this transformation, and therefore of the future of work, hinges upon the determination of the relationship between ends and means and therefore of the quality and of the kind of human agent responsible for self-determination. The powerful networking of knowledge, control, and automation can be leveraged to enslave or to liberate, to instrumentalize and manipulate, or to empower and capacitate with new freedom.

3. Technology’s Potential for Integrated Freedom or for Alienation

Throughout history, technology has often been applied to advance productivity with a view to making the worker little more than a cog within a machine. The integration of today’s new discoveries risks transforming the experience of new technologies, including entertainment, into a new slavery and a trap whereby one's personal preferences are unconsciously manipulated.
by the buyers and sellers of one's own attention and interest. Technological progress always entails plusses and minuses. On the one hand, productive work becomes more efficient by eliminating repetitive tasks and the physical labor once constitutive of the greater part of those jobs whereby most of us were once able to earn a living for ourselves and our families. Such an increase in mechanical efficiency is already eliminating the need for many workers who are being rapidly replaced by machines. On the other hand, and more hopefully, these new technologies leverage human capacity to augment our personal creative reach and connectedness, thereby multiplying opportunities for deeper interpersonal relationships, even from afar.

Consequently, men and women are challenged to work at a higher level of creativity instead of being measured by their mere brawn. Once repetition and physical strength are replaced by automated machines, humans become less comparable to mere material resources and should be more readily recognized as members of communities who cooperatively act in concert for shared goals and ideals. Nonetheless, with the connectedness that overcomes distance, concepts like outsourcing and offshoring seem simplistic when much work can be readily distributed among individuals located anywhere on the globe. Neither distance nor time zone can now inhibit the new models for managing employees, not as a mere resource but, hopefully, more and more as stakeholders, wherever their current location.  

No one, no matter what their talents or preferences for employment, can escape the revolutionary transformations of work. This is so whether one works on a farm, in a hospital, a factory, or, of course, in the knowledge class. The intrusion of new technologies will affect us all and challenge us to work not as cogs, but as purposeful agents of our destiny; not as inanimate

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instruments, but as reflective and creative agents of self-determination within a network of community interactions. It occurs within a hierarchy of production and service and within a cooperative relationship with users, customers, clients, guests, fellow team members, and patients. However, with this more hopeful vision of a marketplace of networked and creative workers, comes a greater challenge regarding the cohesive relationship between the members of a team in accord with the organization's mission.

4. New Features of Old Virtues and Scientific Complementarity with Classical Philosophy

Moreover, the challenge constituted by the need for such intrinsically ordered, self-driven, creative agents includes a hidden requirement for new features of old virtues.8 The multidisciplinary complexity of the revolution that we are experiencing, with its technical, economic, and political implications, requires a multidisciplinary response integrating the philosophical, psychological, and theological in addressing how men and women can advance personal identity within the challenge to develop these new features of the old virtues so dearly needed to excel at the work required by the fourth industrial revolution.

It seems providential, therefore, that at this historical moment of extraordinary transformation, there is, likewise, an extraordinarily coincidental complementarity between the scientific discoveries of psychology and neuroscience with the enduring principles of classical virtue theory. This complementary coincidence of principles and discoveries can offer a response to today's revolutionary challenge. Damien Fair, a neuroscientist and psychiatrist at Ohio State University, offers a succinct summary of the core of the solution, that connects these

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complementary fields of research in philosophy, psychology, and neuroscience. Fair broadly affirms that: “The human capacity to maintain task goals, selectively attend to relevant information, and avoid distraction is unrivaled.” By “unrivaled”, I take Fair to mean on the whole and in general. Indeed, there is nothing in the universe of greater importance than this human capacity for self-mastery, that is, precisely what classical philosophy called freedom, the capacity to determine oneself in the good. There is nothing greater than this in the universe because human freedom orders, shapes, and directs everything else in the material universe in concert with the human intellect's understanding.

In the first place, and Fair would surely agree, this human capacity must direct oneself by ordering oneself to one's understood goal and aim, not just once or twice, but here and now consistently over time. This consistency requires the habits of moral excellence that Aristotle called virtue. Moreover, this capacity to maintain focus on one's goals requires ordering everything to one's end and, therefore, the successful achievement of a certain unity of one's life. This can be best understood as a heroic journey informed by a plot whose end constitutes one's definitive personal success. Such focus, attention, mindfulness, and commitment to one's goals requires living as the protagonist of a story with the promise of a happy end. To live such a life of focused commitment is to be the author of one's own life.

10 See St. Thomas Aquinas, Summa Theologiae, 1.2.89.6.
11 Aristotle, Nicomachean Ethics, II vi, 1107a, translated H. Rackham (1934: Cambridge, Massachusetts, Harvard University Press): "Virtue (arete) then is a settled disposition of the mind determining the choice of actions and emotions, consisting essentially in the observance of the mean relative to us, this being determined by principle, that is, as the prudent man would determine it."
12 For a proposal for understanding work as an inherently meaningful component of one's own autobiographical narrative, see my "From Aristotle's Ethics to St. Josemaria's Divine Comedy: Practice and Narrative as Constitutive Components," in G. Faro's Pensando il lavoro, Edusc, 2018. For an extensive monograph on the philosophy and psychology of autobiographical narrative as constitutive of one's own identity, see Omowumi Omoyemi Ogunyemi, Autobiography, Time, and Narrative in Philosophy and Psychology, EDUSC, Rome, forthcoming in 2020, with Foreword by Robert Gahl (pp. 9-11).
Fair's appreciation of freedom concurs with that of many psychologists and neuroscientists who value the capacity to maintain focus on what one wants to focus upon as central to and constitutive of mental health. And they all concur with classical virtue theory as expounded by Aristotle. Moreover, in marked contrast with the virtuous disposition, cognitive behavioral psychologists consider obstructive to one’s mental health, to achieving peak performance, and to personal satisfaction, those tendencies that conflict with focus, such as rumination, intrusive thoughts, and distractions.\(^{13}\) Rumination, intrusive thoughts, and distractions also happen to be especially powerful adversaries of productive work, especially in the midst of the fourth industrial revolution wherein human agency must be attentive and concentrated upon the task at hand even when one is not engaged in any particularly demanding physical effort. Such constant concentrated focus must now be achieved and maintained while challenged by the distractions of new technologies and invasive features of virtual reality. Although these new technologies may sometimes enhance our ability to attend to the task at hand, they often distract from efforts to maintain selective attention.

5. Cognitivism and Aristotle vs. Stoicism and Buddhism

Positive psychologists have identified rumination, intrusive thoughts, and distractions as symptomatic of the sub-ideal coordination of emotions and thought patterns by the human mind.\(^{14}\) Moreover, cognitive behavioral therapies (CBT) offer practices of mindfulness that have been scientifically demonstrated to be effective, even to achieve empirically demonstrable


\(^{14}\) For a recent study of how rumination and intrusive thoughts contributes to depression, see: Kralj, Aleksandra. *Intrusive thoughts and rumination in young people with depression, PTSD and a non-clinical control group.* Doctoral thesis, University of East Anglia, 2017.
physiological results.\footnote{For an ACT evidence based study applied to a specific area of digital technology, see: Jesse Crosby and Michael P. Twohig's "Acceptance and Commitment Therapy for Problematic Internet Pornography Use: A Randomized Trial," \textit{Behavior Therapy} 47 (2016) 355–366.} In particular, and once again in complementary coordination with Aristotelian moral psychology, acceptance commitment therapy (ACT) and relational frame theory (RFT) offer techniques for overcoming disordered emotions and thought patterns so as to grow in the virtues.\footnote{See, for example: Steven C. Hayes, Kirk D. Strosahl, and Kelly G. Wilson, \textit{Acceptance and Commitment Therapy, Second Edition: The Process and Practice of Mindful Change}, 2nd edition (New York: The Guilford Press, 2011) and Steven C. Hayes, Dermot Barnes-Holmes, and Bryan Roche, eds., \textit{Relational Frame Theory: A Post-Skinnerian Account of Human Language and Cognition}, 2001 edition (Springer, 2007).} Although many psychologists aim for an agnostic approach with respect to anthropological presuppositions, their techniques, nonetheless, complement the Aristotelian moral psychology more effectively than the frequently preferred references for a foundation in the moral philosophy of Stoicism or in the religious practices of Buddhism. Both ancient Stoicism and Buddhism frequently aim at versions of indifference from feelings and commitments along with fatalistic acceptance of destiny and immanent forms of self-transcendence.\footnote{See Robert Gahl, “Time, Story, Corporate Self-Understanding, and Personal Accomplishment,” in Personal Flourishing in Organizations, a cura di Juan A. Mercado, Springer, 2018, 37-47.} More productively, Aristotelian moral psychology offers a framework for whole-hearted commitment to the good as the rational principle for providing order to the passions.

One central feature of the characteristic challenges of the future of work consists in the capacity of interconnectedness and new technologies to excite neural pathways in novel ways for which we are unprepared by our evolutionary biological makeup and are, thus, especially challenged to engage our intellect so as to direct, inform, and master impulses embedded in our biology. These impulses are experienced by our entire self and yet their spontaneous emergence occurs without our full dominion over them. In addition to their often being entirely undesired,
we may not even be fully aware of them and of their impact upon our inner self.

In contrast with other animals and on account of our creative imagination, we are endowed with an inner virtual reality machine capable of constantly creating possibilities, present or future, accompanied by the corresponding emotions of fear, excitement, revulsion, and at times pleasure. We are biologically wired for the capability to vividly draw together past experiences and combine them with future possibilities. This specifically human capability for creative imagination is at once a curse and a blessing. Without it, we would not be able to invent new products and processes by discovering new potential hidden in matter. Nonetheless, because of this capability we are cursed by an infinite range of raging possibilities never realized, yet suddenly imagined for the first time ever. A gazelle grazing on the African Sahara is completely undisturbed by the threat of a crouching lion, unless or until the gazelle catches the scent of its predator. In contrast with the gazelle's bucolic serenity, we humans may find ourselves terrified in the middle of the night, while safe in our own beds, by the thought of an imagined email that we have never received and that perhaps, we hope, we never will. And yet, the imagination of the possibility ignites terror throughout our being.

One current common manifestation of this capacity for imaginative creativity and its accompanying emotions has become a pathological commonplace: the phantom cellphone vibration. Many users of smart phones are suddenly sure that they feel a vibration coming from their cell phone, typically in their hip pocket (at least for men), and then look to check and realize that the perceived signal was only imaginary. Despite the verification of the false alarm,

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the temptation remains to leave behind the task at hand and immerse oneself in the enormous capabilities of the smart phone, including those that signal emotionally powerful personal interconnectedness.19

The capability to imagine threats readies us for flight or fight. In our present circumstances, especially those demanded by Industry 4.0, the ability to imagine non-existing threats and opportunities capacitates us to see around the corner and over the horizon to flee from or fight off the threats and to strive for the opportunities. Our inner virtual machine offers the upside of envisioning new opportunities and creating safeguards against novel dangers, but also the objective stressor of perpetual threats, even those constituted by the fear of missed opportunities.

6. Objective Stress, Subjective Appraisal, and the Mindset of Personal Growth

Recent neurobiological studies make a crucial distinction between two features of stress: the objective extrinsic stressor and the subjective internal appraisal of that stressor. For decades it has been known that stress, especially if chronic, can contribute to various lethal pathologies, such as inflammation induced cardiovascular disease.20 More recently it has been discovered that stress also has a beneficial side. There are two paradigms for handling stress. Trying to avoid stress can kill you. But if you embrace it, stress offers an opportunity for growth, even for those

around you. Zero stress would diminish the challenges of life and therefore the opportunities for growth. Healthy stress, however, can contribute to excitement, growth, and a full life of human flourishing. The distinction depends upon one's subjective appraisal of the objective stressor. By viewing threats as opportunities for growth, we can transform a threat to our mental and physiological health into an occasion for thriving. The reframing of the stressor engages our understanding and volition by viewing the stressor in a new way and by accepting or even desiring it.

Moreover, by effecting the transformation through subjective reframing, one grows in the Aristotelian virtues by instilling in one's emotions the right order of reason. With our internal human virtual reality machine and the real time interconnectedness of Industry 4.0, the stressors are multiplied and so are the opportunities for innovative growth in the classical virtues. With the facilities and comforts of technological progress comes greater opportunity for practicing the habits of delayed gratification. Every occasion for delayed gratification is an opportunity to renew our commitment to the goal and our hope for the purpose that gives unity to our life. A recent neuroscientific study published in *Nature Communications* confirms and advances the Aristotelian implications of the importance of the virtuous appraisal of objective stressors.

Although much more needs to be explored regarding these recent conclusions from the effects of stress on the brain, they seem to indicate, based on functional magnetic resonance imaging (fMRI), that during an objective stressor one's hippocampal connectivity with a network including the hypothalamus, which is known to regulate physiological stress, predicts greater subjective appraisal of the stress. Whereas, in contrast, greater connectivity with the dorsolateral

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prefrontal cortex (dPFC) predicts attenuated appraisal of stress. The dPFC is the area of the brain activated when engaged in activity such as executive function, working memory, cognitive flexibility, planning, inhibition, motor planning, organization, regulation, and abstract reasoning. In sum, such dPFC activation indicates that such higher order activities correspond with the activation of the area of the brain most advanced from the evolutionary perspective.\textsuperscript{23} Therefore, it would seem beneficial if, while facing an objective stressor, one directs one's thoughts towards activity in accord with one's commitments rather than wallowing in the negative emotion of the perceived stress. Consequently, the very experience of that negative stressful emotion will be attenuated as one's hope for achieving the goal is activated. By not avoiding the stress and by not complaining about it, but by embracing the experience as an opportunity for growth, one exercises patience. Aquinas considered patience to be the root and the custodian of all the virtues insofar as it removes their obstacles.\textsuperscript{24}

7. Optimal Work and Peak Performance

Kevin Majeres, a Harvard Medical School professor of psychiatry and clinical therapist, offers an innovative practice of mindfulness called “Optimal Work.” Designed to achieve peak performance along with the joyful thriving in the face of the challenges afforded by the future of work, Optimal Work may be most deeply understood when viewed as rooted in the Aristotelian tradition and in the Christian faith. In accord with research on stress, Majeres analyzes our relationship with anxiety and recommends that we face it head on, even to embrace it as an opportunity for growth. Peace comes not from avoiding anxiety but by welcoming it. The


experience of adrenaline secretion caused by anxiety can be perceived as a threat and, therefore, cause a cascade of ill effects, even death. Or, we can acknowledge the excitement caused by the adrenaline as an opportunity for growth. The exciting boost of adrenaline offers an opportunity to act better by renewing our goals rather than succumbing to the dictates of feelings. Paradoxically, by not giving in to feelings and by renewing our cognitive commitments, we grow in virtue and, hence, achieve control over our feelings for the sake of focusing on what really counts in our life: our goals and commitments. Thus, human flourishing is not insensitivity but rather a life lived in accordance with commitment. By exercising dominion over feelings, we achieve freedom. Majeres explains: “Instead of pursuing freedom from discomfort, we pursue a virtuous course of action, and in the pursuit, we find a higher kind of freedom.... we also find peace. But we cannot seek the feeling directly. We can learn instead to embrace these difficult emotions and act virtuously while they’re present.”

8. Commitment, Hope, and Community

Recent psychological discoveries and clinical practice promote hope as a strategy for the successful pursuit of goals while regulating emotions in accord with one's own commitments. Once again, we find complementarity with Aristotelian virtue theory and even more so with Aquinas’ Christian interpretation of Aristotelian ethics. One's final purpose gives shape to one's whole life by informing all of one's activity. For Aristotle and for Aquinas, that

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which is most final is most formal.²⁷ Like the soul in the body that gives life and organizes organically as the principle of unity, so too, the end gives life and order to all that one does. Likewise, in the order of the virtues, that are habits of right action, insofar as the virtue of hope aims for the end, hope also informs all of the virtues. Thus, one is prudent, just, brave, and temperate on account of one's hope.²⁸

Majeres' proposal for achieving “Optimal Work” in the here and now entails focusing the mind by renewing one's commitment to the goal and reframing the challenges inherent to the task at hand as an opportunity for personal growth with the method: “ready, set, go!”²⁹ By first preparing oneself and the tools necessary for the task, then settling the mind and renewing the commitment to one's goals, and then forging ahead with all one's ability, one can achieve better focus and joy at work.

9. Conclusions

The fourth industrial revolution promotes interfacing and connectivity between machines, data, knowledge, and between humans.³⁰ For humans to work in concert effectively they must seize the challenge together as teams as they face the stressors of new forms of connectivity and imagination. For good or for ill, feelings and emotions can be transferred to

²⁷ See Thomas Aquinas, *Summa Theologiae*, 1.2.18.4c,6c, and 1.2.19c. See also regarding hope as final cause of virtuous action: *Summa Theologiae*, 2.2.17.5.

²⁸ Of course one can possess a virtue to an imperfect degree without all of the rest, but perfect virtue requires all of the virtues, including the three theological. See, for example, Renée Mirkes, “Aquinas on the Unity of Perfect Moral Virtue,” *American Catholic Philosophical Quarterly*, 71, 4 (1998) pp. 589-605.


³⁰ For a recent study of the importance of purposeful work for the sake of service to others, see Rahul M. Jindal, “Service to Others May Be the Answer to Physician Burnout” *JAMA Surg*. Published online April 15, 2020. doi:10.1001/jamasurg.2020.0046.
those who are close to us, as can thoughts, convictions, and desires. By achieving dominion over disordered feelings and by exercising the patience needed to avoid complaining, all while exercising our own personal freedom for the good, we assist those with whom we work to practice such self-mastery in accord with their hopes and desires. By seeking to help one another and to be helped, by living the virtues of acknowledged dependence in teams that are shaped by an organizational mission, all team members can grow together. They do so by way of their common commitments and commonly held reasons for hope that give ultimate intelligible shape to their organizations and which define their very soul.\footnote{Michael J. Poulin et al., “Giving to others and the association between stress and mortality”, \textit{American Journal of Public Health}, September 2013.}

Consequently, the challenge of Industry 4.0 spurs individuals to live new features of old virtues, including the virtue of hope, while also challenging organizations to become foundries where those new features of virtues are born, renewed, and fortified by those who cooperate freely together.\footnote{For a study of the role of hope and meaning in avoiding deaths of despair, see Ying Chen et al., “Religious Service Attendance and Deaths Related to Drugs, Alcohol, and Suicide Among US Health Care Professionals,” \textit{JAMA Psychiatry}, May 6, 2020, \url{https://doi.org/10.1001/jamapsychiatry.2020.0175}.} The virtuous expression of human freedom involves habitually directing oneself and one’s feelings towards the attainment of an understood good that informs one’s entire life just as the plot gives shape and unity to the actions that make up the dramatic narrative of a story that is one’s life. Insofar as an organization provides the cohesive unity of a community united by the pursuit of a common hope, that organization is a place for both the practice and the contagion of those virtues required by the technological accelerations of the fourth industrial revolution so as to liberate and to integrate and thereby to avoid the pitfalls of technology with their dangerous potential to instrumentalize and to alienate.
The subjective sensation of stress arises from activation of neural networks emanating from the hippocampus. The red lines show connections to the hypothalamus and predict higher perceived stress. The blue lines show connections to the dorsal lateral frontal cortex and lower perceived stress.\textsuperscript{33}